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Zellner, Michael

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Plymouth University

THE ROLE OF UNDERLYING MECHANISMS IN ACHIEVING CONSISTENT HYBRID COMBINATIONS OF COMPETITIVE ADVANTAGES

by

Michael Zellner

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Abstract

THE ROLE OF UNDERLYING MECHANISMS IN ACHIEVING CONSISTENT HYBRID COMBINATIONS OF COMPETITIVE ADVANTAGES

Michael Zellner

This thesis takes a step beyond the current discussion on hybrid competitive strategies (HS) by identifying the underlying mechanisms and common elements of successful hybrid strategies. Reviewing empirical and theoretical literature revealed a significant gap in this respect. Therefore, the activity-based view of strategy is introduced to the discussion on HS.

In a first step, four consistent and sustainable HS concepts are developed providing the basis for deriving specific HS models. A second step identifies commonalities among these HS types and theoretically derives a synthesized, common HS model. Thirdly, the critical realist stance was selected for answering this thesis' five research questions addressing consistent HS concepts, implementations, common activities achieving external and internal fit, as well as common capabilities and resources supporting these activities. In a case study approach, semi-structured, open ended interviews combining appreciative and laddering methods are conducted with twelve interviewees from five firms. The separate analysis of ladder elements and ladders allowed distinguishing constitutional from relational elements. Based on this, fourth, an empirically revised research construct is substantiated.

This research finds HS firms applying intended and consistent, but mixed strategy concepts based on generating high customer benefits through combining competitive weapons of differentiation and price or total customer cost. Moreover, HS concepts centre on three strategic building blocks: customer centricity, fulfilment of customer needs and employee orientation. Additionally, the research indicates that firms apply activities primarily for achieving fit, whereby each relational activity type possess also constitutional characteristics. While all firms combine both views, none of the activities is directed to both fit types simultaneously. Activities deploy capabilities and resources in general on two adaptive and two absorptive mechanisms.

Additionally, several practical implications derive from this thesis. First, firms can apply the synthesized model as a kind of 'blueprint' providing orientation for how to combine competitive advantages. Second, policy makers can apply the outcomes as principles steering firms or industries to 'higher' levels of performance. Last, firm managers can adapt their own as well as their firm's behaviour accordingly.

In summary, this thesis marks a starting rather than an ending point for further theoretical and empirical research applying broader and more quantitative analyses.

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At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award without prior agreement of the Graduate Committee.

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A program of advanced study was undertaken including a postgraduate course on intercultural training, scientific paper writing and research methodology.

Relevant scientific seminars and conferences were regularly attended at which work was often presented; external institutions were visited for consultation purposes and several papers prepared for publication.

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I. INTRODUCTION

Hybrid competitive strategies or simply hybrid strategies (HS) are compelling as they allow generating higher rents by combining several competitive advantages. Furthermore, they are less vulnerable to changes compared to pure or no emphasis strategies as they better address customer needs, are difficult to imitate, and generate a flexible and wide view (Pertusa-Ortega, Molina-Azurin, & Claver-Cortés, 2009). The current body of research on what is termed 'combination', 'simultaneous', 'mixed', 'ambidextrous', or 'hybrid' strategies is comprehensive (Fleck, 1994; Mahr, 2010; Parnell, 1997), however theoretically and empirically equivocal. This is especially disappointing as HS are potentially fruitful in volatile and dynamic environments, most companies facing today (Proff, 2000).

Lines of reasoning for this ambiguity are threefold. The first line focuses on covering the full scope of strategic variety, the second regards varying measures of strategic success, and the third highlights operationalisation issues. Many existing strategy typologies cover the scope of strategic variety incompletely or partially. Among them is one of the most mentioned schemes in empirical and theoretical research on strategic management, Porter's typology of generic strategies (Allen & Helms, 2006, p. 2). Despite making clear recommendations on which competitive advantages to focus at, either cost or differentiation, and which, namely combinations, to avoid, his classification does not include an explicit combination type. Besides that, Porter assigns this 'stuck-in-the-middle strategy' type lack of strategic focus making it unsuccessful. Thus, his typology excludes successful combination strategies completely causing many empirical researchers applying his scheme to confuse and mix underperforming and outperforming HS (Dess & Rasheed, 1992; Wright, Kroll, Tu, & Helms, 1991). In consequence, research on HS based on Porter's scheme, produced inconsistent and incomparable results (Chrisman, Hofer, & Boulton, 1988). Further, strategic targets vary among strategy schools and thus, may bias comparability of empirical research. Examples for different targets are Porter's generic strategies based on company performance, Buzzel et al.'s market share, or Abell's scope and differentiation targets (Porter, 1991; Buzzel, Gale, & Sultan, 1975; Abell, Defining the business: The starting point of strategic planning, 1980). Correspondingly, empirical results on HS range on a continuum from 'prove of vitality' to 'below average performance'. In addition to different performance measures, studies also vary according to different comparison groups. Examples are studies measuring against all companies within an industry sample or comparing only individual strategy groups with one another (Mahr, 2010). Beyond that, some research on HS assesses strategic orientations by subjective assessments of bundles or indicators of a company's resources and capabili-

ties. These approaches, besides suffering the frequent shortcomings of subjective measurement approaches, are potentially biased, as it remains unclear whether intended or measurable, emergent strategy patterns are observed (Mintzberg, Ahlstrand, & Lampel, 1999). Finally, the few research examining operational concepts, activity systems, and resources and capabilities of HS remains limited and fractional. Currently no theoretical or empirical research is available on linking generic concepts with specific activities, capabilities and resources in the context of HS.

This paper aims at extending the strategic management research by identifying the common, underlying mechanisms of hybrid competitive strategies (HS). By applying the activity-based view of strategy on various HS types the underlying generic concept, activity drivers and activities, as well as its stock of resources and capabilities is analyzed. For that reason, theory derived HS type specific models for sequential, variety, quality and innovation based HS are applied for determining commonalities. In turn, this theoretical, synthesized model provides the basis for identifying the most important constituting elements. Furthermore, the model allows determining the underlying, generative mechanisms working within and across HS firm's boundaries. For investigating both constituting and relational model elements a specific research construct based on critical realist philosophy is developed differentiating three levels of reality: the empirical, the actual and the real. From this research construct five key questions are derived examining (1) the consistency of commonalities of HS strategy concepts and (2) corresponding implementations on activity, capabilities and resource level as well as activities achieving (3) external and (4) internal fit, and (5) the required capabilities and resources deployed by activities for achieving fit. Based on these research questions, a qualitative case study approach including appreciative inquiry and laddering interview techniques is developed. Empirical data is then applied for revising the theoretical HS model and answering the research questions. Data analysis is split in two parts, one identifying the constitutional or founding elements of HS by ladder element analysis and one determining the relational elements applied in internal or external mechanisms. Finally, the results of the analysis are used for substantiating the research construct and determining the real generative mechanisms of HS.

Consequently, the thesis structure follows this approach. The literature review in chapter 2 provides an overview on the development of the field of strategic management, determines the activity based view of the firm as the theoretical foundation of this research and reviews the current state of empirical and theoretical research on hybrid competitive strategies. As a result, research issues on HS are determined and the

scope of this thesis defined. Chapter 3 defines a general theory of HS. For that reason, various types of HS are explicated and the underlying activity systems and activities as well as the stock of capabilities and resources are detailed. This chapter concludes by synthesizing the commonalities across the various HS types. Following that, chapter 4 discusses research philosophies founding the basis for determining the research method, construct and design allowing reaching the thesis' objectives. Chapter 5 introduces the participating firms and applies data to empirically revise the theorized HS model. The consecutive analyses comprise the revised models structure, elements and relations resulting in answering the research questions and substantiating the research construct for identifying the underlying mechanisms. Finally, in Chapter 6, conclusions are drawn, limitations of this research study discussed, and an outlook for future research opportunities provided.

In summary, this research's findings contribute to theory by applying a critical realist case study approach on the strategic management topic of HS. In addition, this thesis provides consistent HS types and derives type specific HS profiles, which are further aggregated to a generic synthesized model. ON this basis the underlying mechanisms working operating on the real level are determined and described. Furthermore, the corresponding results contribute to practice in three ways. First, firms can apply the synthesized model as a kind of 'blueprint' providing orientation for how to combine competitive advantages. Second, policy makers can apply the outcomes as principles steering firms or industries to 'higher' levels of performance. Last, firm managers can adapt their own as well as their firm's behaviour accordingly.

II. CRITICAL LITERATURE REVIEW

Literature on HS is reviewed in three steps consisting of first, a general overview on the development of the field of strategic management, second, the introduction of the activity based view of strategy as the theoretical basis for this research, and third, the review on the current body of empirical and theoretical HS research. The review concludes by identifying issues and opportunities in HS research.

A. DEVELOPMENT OF THE FIELD OF STRATEGIC MANAGEMENT RESEARCH

From its beginnings in the 1950's, strategic management was characterized by a practice orientation with a strong focus on business concepts affecting a firm's performance (Hoskisson, Hitt, Wan, & Yiu, 1999). Accordingly, the evolution of strategic management research was driven more by finding answers to practical needs of businesses rather than the development of a consistent theory. This is among the commonalities shared by most strategy scholars. In respect to the development paths strategic management as a field of research took, however, views are divergent. While some scholars see a continuous evolution of the field others assume two extremes the field oscillated. The following briefly describes both views.

A.1. CONTINUOUS EVOLUTION

For the first school of thought strategic management started in the 1950's with financial budgeting focused on operational and capital budgeting. From this stage the field progressed further to corporate planning and strategy. This was primarily driven by an increased attention to acquisitions and mergers in the 1960's. Business policy, an early synonym of strategic management, was based on contingency theory and focused on the relationship of strategy and structure (Ansoff, 1957; Chandler, 1962). From this, the field extended its perspective to the industry and its corresponding influence on firm performance. The dominant strategic concept of this time was industrial organizations' structure-conduct-performance paradigm, determining a firm's performance by the industry structure it operates in and the firm's position it achieved (Bain, 1968). In the 1980's the field again progressed with the conception of competitive advantage. The core stance of sustainable competitive advantage is that market forces are accepted as an influential factor on firm performance, however not the only one. For example, Mueller's study on profit persistence showed that firms with abnormally high levels of profitability tend to decrease in profitability over time and vice versa, without however converging to a common mean (Mueller, 1977). Thus, Mueller concluded that, 'one firm possesses a competitive advantage over its rivals when it earns (or has the po-

tential to earn) a persistently higher rate of profit over its rivals'. If, however, profits do not converge and competitive advantage can be sustained, then market forces cannot fully explain profit differences between companies and these additional forces are working to protect a firm's competitive advantages. In consequence, persistent profit differences are achieved through sustainable competitive advantages through "a value creating strategy not simultaneously being implemented by any current or potential competitors and when these firms are unable to duplicate the benefits of this strategy" (Barney J. B., 1991). The last development step happened in the 2000's with strategic management research increasingly focusing on strategic innovations such as new business models and change market environments in terms of dynamics and complexity.

A.2. Oscillating evolution

The second school of thought considers research on strategic management oscillating around two extremes – the internal perspective and the external perspective (Hoskisson, Hitt, Wan, & Yiu, 1999). This school sees the field's origins in the internal focus on competitive resources with early classics such as Barnard, Selznick and Penrose (Barnard, 1938; Selznick, 1957; Penrose, 1959). Methodologies used at that time were mainly inductive and case based. Generalizations were seen to be impossible because of the nature and number of strategic variables and the problems associated with classifying them (Christensen, Andrews, Bower, & Learned, 1969). In this sense business policy studies merely provided a familiarity with an approach to business problems (Hoskisson, Hitt, Wan, & Yiu, 1999), and in symbiosis with detailed resource analysis, firm's were able to "combine these variables into a pattern valid for one organization" (Christensen, Andrews, Bower, & Learned, 1969). However this normative and prescriptive methodology caused several problems (Hoskisson, Hitt, Wan, & Yiu, 1999). First and foremost, the field's theoretical underpinning was weak. By lagging a profound theoretical basis it was impossible for researchers to theoretically derive hypotheses and empirically test them. As a result, this lead to research results of anecdotal evidence and low scientific rigor. Second, missing generalizations and a restricted use of quantitative methods prevented the field's researchers from progressing both theoretically and empirically.

These reasons initiated a change to the other extreme, the external perspective, in which the research discussion centred on the structure-conduct-performance (SCP) paradigm assuming that firm performance is primarily a function of the industry structure. In this paradigm business strategy is mainly concerned with how attractive an industry is and how firms cope with industry structure and change it to their favour

(Porter, 1980). Rooted primarily in economic theory, particularly industrial organization economics, the methods switched from inductive, qualitative to deductive, quantitative analyses. At this development stage of the field, the term 'strategic management' instead of 'business policy' was coined and signified the move to a more 'scientific', positivistic, and empirically oriented academic discipline (Hoskisson, Hitt, Wan, & Yiu, 1999). The application of economic theory and its strong empirical tradition fostered interest of strategic management researchers in theory building and research methodology (Hofer & Schendel, 1978). Therefore researchers shifted the focus of their interest from prescriptive, to explanatory and predictive analyses. In consequence, traditional case studies were gradually supplemented by large scale studies analyzed with sophisticated statistical methods. During this time, first commercial databases, such as PIMS or COMPUSTAT, evolved and equipped researchers with large firm level data. Additionally, the progress of statistical software and increased computer capacity enabled more complex and large scale analyses (Hoskisson, Hitt, Wan, & Yiu, 1999). At this point in time, the field became familiar with the use of increasingly sophisticated methods, such as multivariate statistical analyses or causal modelling.

However, while dominating large parts of the research field in the 1980's, the SCP paradigm, wasn't undisputed in regards to its focus on industry characteristics. Therefore as evidence increased that inter-firm heterogeneity explains performance differences and in some cases even better than industry membership the pendulum swung back to the internal perspective (Rumelt, 1991; Hoskisson, Hitt, Wan, & Yiu, 1999). In consequence, organizational economics as a subfield of economics appeared and attempted to untangle a firm's inner structural logic and functioning (Hoskisson, Hitt, Wan, & Yiu, 1999). The most prominent and in strategic management widely dispersed theories of organizational economics are transaction cost economics and agency theory (Coase, 1937; Williamson, 1979; Alchian & Demsetz, 1972). Both theories, compared to industrial organization economics, focused on human behaviour and firm specific attributes, such as bounded rationality, opportunism, uncertainty, asset specificity, managerial motives and capabilities, information asymmetry, contracts enforcement, performance evaluation, and allocation of property rights within the organization (Williamson, 1979; Alchian & Demsetz, 1972; Hoskisson, Hitt, Wan, & Yiu, 1999). In this line of reasoning, the focus on firm level led to what is also called positivist agency theory. Contrary to the mathematically oriented, normative principal-agent theory the positivist school focused on institutional details and human action as opposed to mathematical modelling and testing (Rumelt, Schendel, & Teece, 1991; Jensen & Meckling, 1976). However, as the pendu-

lum swung back to the firm level, the above mentioned problems – especially the measurement problem – remained unsolved (Godfrey & Hill, 1995). For this reason, empirical researchers on organizational economics were required to rely on more speculative theory and indirect research mechanisms such as ownership structure and executive compensation (Hoskisson & Hitt, 1990). Therefore, the application of new and sophisticated research methods, such as structural equation modelling, was applied to strategic management (Hoskisson, Johnson, & Moesel, 1994; Hitt, Hoskisson, Johnson, & Moesel, 1996).

While organizational economics turned strategic management's perspective to the inner structural logic and functioning of firms, the resource based view of the firm (RBV) was deepening the focus by considering idiosyncratic resources and capabilities as the sources of competitive advantage (Barney J. B., 1991). In this sense RBV searched to understand ‚why are firms different' and ‚how competitive advantages are achieved and sustained on firm level'.

This stage signified a return to the field's 'origins as already Selznick, Chandler, Andrews and Ansoff focused on ‚distinctive competences', ‚structure follow strategy', ‚firm strengths and weaknesses', or ‚synergy internally generated by combination of capabilities and competencies' as core strategic variables on firm level (Selznick, 1957; Chandler, 1962; Andrews, 1971; Ansoff, 1957). In RBV, sustainable competitive advantage results from 'isolating barriers' (Rumelt, 1984), which put strategic resources' heterogeneity in the centre of its considerations. The term strategic implies a resource's potential to generate sustainable economic rent by its limited strategic substitutability by equivalent resources and time compression diseconomies for firms trying to imitate them (Dierickx & Cool, 1989).

Most of the early research on RBV focused on investigating specific resource types' impact on firm performance. Among others, resources reviewed were intangible assets, organizational culture, organizational learning, entrepreneurship, human resources, or a firm's resource orientation (Itami & Roehl, 1987; Barney J. B., 1986; Teece, Pisano, & Shuen, 1997; Nelson, 1991; Amit & Schoemaker, 1993; Zellner & Büssow, 2004). In a further advancement, however, the focus shifted from the analysis of individual resources to the performance implications of resource and capability combinations (Makadok, 2001; Chmielewski & Paladino, 2007; Zellner & Büssow, 2005).

With RBV shifting back to the firm level, however not just research methodologies became increasingly sophisticated, also a switch in research philosophy – especially to subjectivism, constructivism and critical realism – took place. From a methodological point of view RBV with its focus on a single or few

firms reintroduced inductive, case-based research methods in addition to deductive, large-sample methods (Hoskisson & Hitt, 1990).

B. THE ACTIVITY BASED VIEW OF STRATEGY (ABV)

Activity theory originated from the field of psychology in Russia in the 1920s. With a focus on explaining personality, the theory's core assumption is the unity of consciousness and activity, thereby consciousness meaning not a set of "discrete disembodied cognitive acts" but its location "in everyday practice" (Nardi, 1998; Vygotzki, 1978). Simply put, personality manifests in what you do meaning 'you are what you do'. In this line of reasoning, human personality is the aggregate of her or his social relationships, which are realized by the aggregate of multifaceted activities. Both, consciousness and activity are situated phenomena, in which material and social context is crucial. In addition, activities are not isolated from each other but ordered hierarchically forming the nucleus of personality (Leontov, 1978).

In a general model of activity systems Engeström determines three key relations: the relations between object-oriented activity, agents and the community of which they are part of (Engeström, 1987). Thus, the production of activity requires a subject, an object of activity, tools applied in the activity, and output generating actions and operations (Nardi B. A., 1996). Or put differently, analyzing human activity requires in addition to capturing the kinds of activities humans engage in, the examination of who is engaging in the activity, what are their goals and intentions, what objects result from the activity, what rules and circumstances accompany that activity, and the larger community in which the activity occurs (Jonassen & Rohrer-Murphy, 1997).

An activity is 'the performance of conscious actions and consists of a chain of actions. Actions are chains of operations." (Jonassen & Rohrer-Murphy, 1997, p. 63). In this view, actions are different from activities, as actions contribute towards the ultimate satisfaction of a need but do not satisfy them (Leontov, 1978). However, actions constitute activities, which eventually satisfy a need. Thus, all actions and interactions contributing towards the fulfilment of specific needs are part of the activity (Zott & Amit, 2010). "Actions are discrete, have clear beginnings and endings, and exist over short time-scales. They are goal oriented. 'Activities' on the other hand are complex patterns of practice that endure over long time periods. Activities suggest goals and provide motives" (Blackler, 2000, p. 280). Operations, on the other hand are actions performed unconsciously, or put differently, with practice and internalization the conscious effort declines and activities collapse into actions and eventually into operations. This dynamic relationship works reverse as well, if disruptions increase conscious efforts (Jonassen & Rohrer-Murphy,

1997, p. 63). Such disruptions are not solely external but can be internal as well, as activity systems are disturbance producing systems, forcing their own development (Engeström, 1987). The subject of an activity is an individual or a group of individuals engaged in the activity, while the object is a physical or mental product the activity seeks to achieve. Furthermore, tools are enabling the transformation process initiated by activities. Subjects work in communities, which determine the social interactions among participants as well as the shared beliefs and values that define or affect the activity (Jonassen & Rohrer-Murphy, 1997).

The activity based view of strategy (ABV) grounds on activity theory and thus, similarly to the identification of human personality, characterizes firms by 'what they do' in context specific situations. That corresponds to Selznick's notion of an organization's character as their distinct and integrated "commitments to ways of acting and responding" (Selznick, 1957, p. 57). In strategic management research synonyms used for ABV are micro activities, micro strategy or strategizing, strategic practices or strategy as practice (Allen & Helms, 2006; Johnson & Huff, 1997). ABV focuses on 'detailed processes and practices which constitute the day-to-day activities of organizational life which relate to strategic outcomes' (Johnson, Leif, & Whittington, 2003, p. 3). Among the main goals of ABV is understanding the numerous micro activities making up strategy and strategizing in practice (Johnson, Leif, & Whittington, 2003, p. 3). Thus, it allows entering the 'black box' of activities and probe deeper and gain better understanding "of the micro-mechanisms of business models" (Zott & Amit, 2010, p. 224). Activities are seen as the engagement of assets, resources and capabilities to serve a specific purpose toward fulfilling an objective. Correspondingly, *activity systems* are sets of interdependent activities within and across a firm's boundaries (Zott & Amit, 2010, p. 217). Organizations can be seen as networks of overlapping activity systems or simply activity networks (Blackler, 2000). Units making up such networks are 'communities of activity' sharing characteristics such as beliefs and values, work priorities, common cognitive and technological infrastructure, or supporting each other's work. Accordingly, these characteristics vary across communities leading to tensions in, both, vertical and horizontal collaboration of communities.

ABV stresses the role of firm activities, routines, and business processes in achieving competitive advantage through the engagement of a firm's resources and capabilities (Sheehan & Foss, 2007). The underlying logic of the ABV is that firms receive payment for the activities they perform to provide products or services to consumers and not for products per se (Sheehan & Foss, 2007; Porter, 1985). Activities can

be considered on different levels such as top-level activities of planning, sourcing, manufacturing or delivering or at the level of sub-activities (Davenport, 2005). Competitive advantage results from achieving a favourable – meaning unique and valuable – position within the industry *involving a different set of activities* (Mintzberg, Lample, Quinn, & Goshal, 2003). Thus, certain combinations of activities are more effective than others (Sheehan & Foss, 2007; Allen & Helms, 2006, p. 452). In this line of argument, fit within a firm's activity system is an important factor in achieving competitive advantage. Fit occurs in three different forms, first consistency, second mutual reinforcement, and third, comprehensive system optimization (Mintzberg, Lample, Quinn, & Goshal, 2003). Thus, fit within the activity system allows distinguishing strategic implementations in those, which are factually inconsistent, and those, which seem to conflict on high level, but fit consistently on lower levels (Sheehan & Foss, 2007, p. 219). Overall, competitive advantages result from the fit of the entire system of activities and strategy is about combining activities (Mintzberg, Lample, Quinn, & Goshal, 2003).

This is similar to Porter's value chain, which decomposes a firm's activity system into functions and activities from which competitive advantages result (Porter, 1985). However, Porter adds another level of analysis to the ABV, the *activity driver*. Activity drivers represent "the underlying source of competitive advantage" and explain why a firm's set of activities is generating more value than a competitor's (Pearce & Robinson, 2005, p. 104; Sheehan & Foss, 2007, p. 453). Drivers can be used to manipulate the value chain either in terms of cost and differentiation or in order to improve fit within a firm's activity system (Sheehan & Foss, 2007; Ghemawat, 2006). They are generic and structural in nature, what requires a firm's management to adapt drivers firm specifically. This way, drivers make competitive advantage operational (Pearce & Robinson, 2005). Competitive advantage then results from the sum of cost and value generated by each firm activity and can only be determined relative to a firm's competition (Sheehan & Foss, 2007). Drivers are distinct from resources, as drivers need to be made controllable by the firm, while resources need to be organized and developed according to the logic inherent in a firm's activity system (Sheehan & Foss, 2007, p. 458). In addition, drivers are generic, while an activity system is a concrete manifestation of how a firm does business. The manifestation occurs on two levels: the individual activity and the collective, overall activity system orchestrating all activities within a firm's internal and external value chain (Allen & Helms, 2006). Despite the unilateral relationship of drivers on collective level, on individual level single activity drivers operationally influence multiple activities and

vice versa. This multi-lateral operational relationship leads to decoupling of activity drivers from an activity system and its constituent activities.

ABV benefited from another important strategy school as well, the RBV focusing on unique resources and capabilities as drivers of superior performance (Barney J. B., 1991). In this notion, competitive advantage results from barriers to imitation (Mahoney & Pandian, 1992, p. 371). These barriers rest on the assumption of inefficient factor markets (Bongartz, 1997). Hence, the possibilities of a firm are not a function of opportunities it confronts; rather a function of what resources an organization controls (Teece, Pisano, & Shuen, 1997). Consequently, competitive advantages are located 'upstream' of product markets (Teece, Pisano, & Shuen, 1997, p. 513). In this sense, strategic resources and capabilities are scarce, firm-specific, valuable and difficult to imitate. Thereby, a resource refers to a tangible or intangible firm asset or input to production owned, controlled, or accessed on a semi-permanent basis (Helfat & Peteraf, 2003). Contrary capabilities are special types of firm-specific resources enhancing the productivity of a firm's other resources by coordinating a set of tasks and utilizing resources (Makadok, 2001). Typically firms consist of and use a combination of resources and capabilities. Often resources are 'co-specialized' and value derives only from certain combinations (Teece D. J., 2009). In addition, past investment decisions often lead to path dependencies (Mahoney & Pandian, 1992). ‚Distinctive competences', ‚core resources' or ‚core competences' are frequently used synonymously for capabilities (Selznick, 1957; Peteraf, 1993; Barney J. B., 1986; Wernerfelt, 1984; Hamel, 1994).

In contrast to RBV thinking, ABV considers the availability of (bundles of) rare, valuable, and inimitable resources and capabilities a necessary but not sufficient prerequisite for achieving competitive advantages. Rather it emphasizes the importance of transforming resources into competitive weapons leading to competitive advantages through activities (Porter, 1991; Stalk, Evans, & Shulman, 1992; Chrisman, Hofer, & Boulton, 1988). Competitive advantage rests on a firm's activity system, the performed activities and activity drivers. In ABV, competitive advantage results from "mechanisms through which resources and capabilities get exposed to market processes where their ultimate value and ability to generate competitive advantage are realized" (Ray, Barney, & Muhanna, 2004, p. 35). In this notion resources are stocks which have no value per se and can even destroy value if storing the resource, such as unemployed labour, generates cost. Deploying the resource or capability in an activity generates value. Therefore, RBV is not explaining how resources create competitive advantage as it lacks to uncover the linkage

between resources and product markets (Priem & Butler, 2001; Wang & Ahmed, 2007). For instance, underemployed labour is a cost-generating stock, which is potentially value-creating if employed to produce something the market values and demands. Finally, it needs to be stated that none of the above-mentioned steps in isolation is sufficient to generate competitive advantage. However, RBV and ABV are compatible (Sheehan & Foss, 2007, p. 452) and complement each other. Thus, RBV is focusing on managing a firm's portfolio of resources, while ABV is concerned of how to transform a firm's resources into competitive advantage (Dierickx & Cool, 1989; Black & Boal, 1995). In this sense, RBV is more static in nature and describes what pool of resources and capabilities is available to the firm. ABV is complementing this view by explaining how a firm's resource pool is applied and dynamically developed further.

Closely related to RBV, the dynamic capabilities school also intends to explain the dynamic development of a firm's stock of resources. Thus, dynamic capabilities are defined as 'the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments' (Teece, Pisano, & Shuen, 1997, p. 516). In this sense, dynamic capabilities are a capability in a firm's overall capabilities portfolio allowing adapting the portfolio. Another definition by Eisenhardt and Martin stresses the procedural character of dynamic capabilities as they are 'the firm's processes that use resources – specifically the processes to integrate, reconfigure, gain and release resources – to match and even create market change' (Eisenhardt & Martin, 2000). This can be seen as a response to the static nature of RBV but it reduces the market adaptation requirements to the level of processes and routines. However, capabilities are not processes, rather they are embedded in processes (Wang & Ahmed, 2007). While processes are often explicit and codified structures, capabilities are a firm's combinative capacity to deploy resources including explicit processes as well as tacit elements embedded in processes (Wang & Ahmed, 2007). In addition, capabilities are often firm-specific and developed over time through complex interactions between a firm's resources (Amit and Schoemaker 1993). In a dynamic capabilities view, a firms capability and resource portfolio consists of dynamic and non-dynamic resources and capabilities. Thus, a hierarchical order between resources – on the lowest level, as they are the most profound building blocks –, core capabilities – bundles of resources and capabilities with strategic importance – and dynamic capabilities – on the highest level, as they are adapting the overall portfolio – exists (Wang & Ahmed, 2007).

The genesis of competitive advantage from dynamic capabilities is disputed within the research stream. Eisenhardt and Martin consider dynamic capabilities as just another type of capability and thus negate their potential to generate sustained competitive advantage (Eisenhardt & Martin, 2000, p. 1117). In their view, dynamic capabilities can only generate temporary competitive advantage by being applied 'sooner, more astutely, and more fortuitously' than competition to create resource configurations (Eisenhardt & Martin, 2000). Contrary, Wang and Ahmed argue that dynamic capabilities can sustain competitive advantage by continuously achieving fit with a changing market environment by " transforming firm resources and capabilities into outputs in such forms as products or services that deliver superior value to customers" (Wang & Ahmed, 2007). In this line, dynamic capabilities are in line with RBV's general argument of achieving sustainable competitive advantage through idiosyncratic, firm-specific, valuable and rare resources, which are in this case dynamic (Barney J. , 2001). Correspondingly, despite deepening the insights into the mechanisms of generating competitive advantage by dynamically fitting a firm's resource and capabilities portfolio to market needs, it still lacks an explanation of the underlying generative mechanisms producing that competitive advantage. However, the ABV, with its dedicated and clearly differentiated focus on activities, rather than resources or capabilities, is able to explain the origins of competitive advantage. Thus, the delineation between activities and dynamic capabilities is small but essential and can simply put as a difference of 'what can be done?' versus 'what is done by whom in which context?'.

As a last important school having strong impetus on and thus needs to be delineated from ABV is the strategy process school (Jarzabkowski, 2005). This research stream developed simultaneously in Canada, UK, and Sweden in the mid of the 1970s (Pettigrew, 1977; Mintzberg, 1973; Mintzberg, Raisinghani, & Theoret, 1976; Jönsson & Lundin, 1977). It made major contributions such as the opening up of the 'black box' of organizations, the inclusion of human beings and actions as well as the legitimation of in-depth case studies (Johnson, Leif, & Whittington, 2003). All these contributions are relevant for ABV in general and this research in particular. However, the process school has limitations, which the ABV intends to lift. Among the most relevant are its reliance on second-hand information and retrospective reports, its focus on top managers as strategic actors, its lack of practical implications, its separation of content and process, its limited ability to produce general theory and its missing link to strategy outcomes (Mazzola & Kellermanns, 2010; Johnson, Leif, & Whittington, 2003). As the ABV aims at digging fur-

ther into the organizational black box and intends to explain the underlying practices and activities, which underpin and constitute strategic phenomena. “In sum, the process tradition has got us some way into the black box of organizations, but we have further to go if we are to truly understand the micro-activities that make up organizational processes and contribute to organizational value” (Johnson, Leif, & Whittington, 2003). ABV overcomes the process school’s limitations by closely engaging with practice involving managers not just as primary sources of information but also as research collaborators (Eden & Huxham, 1996). Thus knowledge in ABV is coproduced with practice. In addition, ABV’s research focus on micro activities constrains research design as well as the scope and units of analysis (Johnson, Leif, & Whittington, 2003). This restrained focus, however, can contribute to broader theory development by drawing on prior theory, selecting the cases for analysis purposefully using literal or theoretical replication across such multiple-case studies, and comparing evidence with extant literature. Moreover, in ABV both, strategy content and process merge considering both as essential drivers of firm activity. Finally yet importantly, ABV allows linking macro phenomena, such as competitive advantages firms achieve within the industry, with micro explanations (Johnson, Leif, & Whittington, 2003). Therefore, ABV is chosen as the theoretical basis for this research searching for underlying mechanisms of hybrid competitive strategies. While in the strategy process school competitive advantage results from a firm’s strategic processes, in ABV micro-activities engaging resources in accordance with strategic processes and contents are seen as sources of competitive advantage.

Consequently, the definition of the firm in this thesis follows its theoretical underpinning. In general, two general orientations of firm definition can be differentiated (Spender, 1989). One treating ‘the firm as an independent entity operating in a social or economic market environment’ and consequently separating firms and markets. The other one is concerned with the firm itself and its constituent elements such as individuals or work groups (Spender, 1989; Smith A. , 1970; Weber, 1969; Taylor W. F., 1967). The difference between both is significant. While the first conflates the organization with its members, treats the organization as a ‘black box’ and focuses primarily on a firm’s external relationships, the second treats the firm as an interactive system and focuses on a firm’s inter-group or inter-individual relations and the control mechanisms which make this system organized, stable and purposive’ (Spender, 1989, p. 14). In that sense, ABV follows the second tradition with a specific focus on firm activities or put differently this thesis regards firms as interactive systems of activities deploying resources and activities in order to adapt to an industry’s activity drivers as determinants of its external relationships. This way, this thesis’ firm

definition follows the theory of the managed firm supposing firms exist 'because someone willed it. We cannot say much about Will, but we can say the firm exists because a person saw or made an opportunity space in the world that was (a) constrained to be small enough to be occupy-able, and then (b) occupied as a matter of practice … The entrepreneurs opportunity space is bounded by the limits to what s/he can do. Beyond these limits the possibility of action becomes uncertain. The entrepreneur can make something happen on his side of the boundary, but probably not beyond it' (Spender, 2013, p. 12).

C. LITERATURE REVIEW ON HYBRID COMPETITIVE STRATEGIES

While some strategy typologies postulate a performance advantage for applying a 'pure' strategy position, others identify 'mixed' or 'hybrid' positions as best performing, such as Miles and Snow's analyzer (Porter, 1980; Miles & Snow, 1978; Buzzel & Wiersema, 1981). In a reaction to the discussion if or if not HS are successful, the research community intensified effort to develop and test generic strategy paradigms at the beginning of the 1980's.

In the following, a structured review on the existing literature is provided. Therefore, first, the main commonalities between strategy typologies are explained, before, different types of HS found in the literature are discussed. Based on that, in a third and fourth step, a review of the most important empirical and theoretical research contributions on HS is presented. Based on that, finally, research issues on HS are inferred.

C.1. COMMONALITIES IN STRATEGY TYPOLOGIES

Most strategy typologies share two main characteristics, founding the basis for outperforming competitors: internal consistency and external sustainability. Despite general agreement on both of these characteristics, dispute exists on principles of concentration and dimensionality. Each of these principles is addressed in the following.

C.1.1. CONSISTENCY

The system based consistency principle, widely applied in strategic management, follows the motive that strategies need to be constructed and implemented avoiding system immanent conflicts (Acquaah & Yasai-Ardekani, 2008, p. 353).

However, in discussing strategic contradictions and their emergence, the unit of analysis is crucial (Gupta, Smith, & Shalley, 2006, p. 694). Potential units of analysis are organizations as a whole, a firm's activity system and its decomposed parts, as well as the individual level of resources and capabilities.

Depending on the unit of analysis, conflicts can either be accepted and trade-offs made, conflicts can be resolved by balancing tensions or completely avoided through concepts allowing coherent implementations within a firm's value chain (Simsek, Heavey, Veiga, & Souder, 2009, S. 868; Fleck, 1994; Porter, 1980).

Research on March's exploration and exploitation strategies exemplifies parts of this development. Early research often claimed that combining different competitive advantages is impossible. That way, a firm's activity system can either be consistently aligned to exploration (cost) or exploitation (differentiation). The level of analysis is, despite mentioning a firm's activity system, the organization as a whole. Contrary, recent research on 'organizational ambidexterity' (OA), turned to thinking of balancing tensions of seemingly contradictory advantages. This led to a rich body of research identifying a firm's combinative properties and capabilities, such as context, culture or management skills (Gibson & Birkinshaw, 2006). Thus, the original organizational focus shifted to an activity system level and even to the level of (groups of) individual resources. However, OA still assumes immanent tensions and a necessity of trade-offs (Simsek, Heavey, Veiga, & Souder, 2009). Raisch and Birkinshaw explicate this assumption by stating that "… managing two *inconsistent alignments* within an organization simultaneously is far more complex than managing one consistent strategy after the other or externalizing one of these activities" (Raisch & Birkinshaw, 2008). This 'inconsistency assumption' narrows the research spectrum of OA on HS mainly on a firm's capability to manage unavoidable conflicts.

In contrast, comparably few researchers analyzed the existence and constitutional characteristics of HS combining multiple competitive advantages consistently (Pertusa-Ortega, Molina-Azurin, & Claver-Cortés, 2009; Claver-Cortés, Pertusa-Ortega, & Molina-Azorín, 2011; Morschetta, Swobodab, & Schramm-Klein, 2006; Acquaah & Yasai-Ardekani, 2008). In fact, consistent HS need to implement activities affecting concurrently exploitation in some parts of a firm's activity system and exploration in the same or other parts. According to this consistency requirement of HS concepts, two distinct HS types can be differentiated. First, concepts that assume inevitable tensions within a firm's activity system require a firm's management to balance tensions. Such *management based* HS conflict, however, with the consistency principle. The second distinct type regards concepts that coherently align a firm's activity system on multiple competitive advantages. Tensions do not occur as the implementation of activities favouring one competitive advantage simultaneously forward the achievement of another (Jiao, Ma, &

Tseng, 2003, p. 809; Chrisman, Hofer, & Boulton, 1988; Fleck, 1994). Only such *concurrent* HS are compliant with the consistency principle.

C.1.2. Sustainability

In order to sustain a competitive advantage a strategy has to be inimitable by its competitors, unique and stable in nature (Barney J. B., 1991). For this, collective design and market exposure of a firm's activity system and its underlying resource and capability portfolio is vital. Implications depend on the unit of analysis and can be differentiated on organizational and individual level.

The fundamental question answered on *organizational* level is 'How resources are transformed by a firm's activity system into services and how (bundles of) resources are integrated?' One starting point for answering this question is if generic competitive concepts are available to all firms within or across industries (Sheehan & Foss, 2007). However, if such concepts are widely diffused within and across industries, they cannot be considered sources of competitive advantage. The institutional view – opposing the economic view of value-maximizing choices – conceptualizes manager's decision making normatively, bounded by factors such as social judgment, historical limitations, and the inertial force of habit (Ginsberg, 1994). Consequently, managers "…make selective strategic choices about accumulation and acquisition of firm resources, and these decisions, in turn, affect the potential for firm heterogeneity and sustainable advantage" (Bharadwaj, Varadarajan, & Fahy, 1993, p. 701). Besides managers' decision behaviour in implementing strategies, also collective know-how comprised in structures, business processes or social norms fosters firm heterogeneity (Spender, 1994). While some scholars determine collective know-how as the aggregation of individual knowledge, meaning all learning within organizations is individual, others treat organizations similar to individuals in a way that organizations remember through its routines, procedures and by institutionalizing individuals' beliefs (Simon, 1991; March, 1991). In this paper a different view is followed: Collective knowledge is embedded in collective ways of acting and thinking and manifests for example in a firm's procedures, culture, or social norms and is emergent in nature (Spender, 1994).

In summary, sustainability results from a management's capability to apply consistent concepts, to configure a firm's activity system and to develop a firm's resource portfolio accordingly, altogether making a firm's strategy inimitable and unique. Changing collective firm attributes such as activity systems or collective knowledge is rather long-term and thus better protects competitive advantage over time. This especially holds for HS, which are more complex in terms of concepts as well as implementations than

singular or no emphasis strategies. In addition, HS complexity provides another sustainability driven benefit: adaptability. HS improves adaptability by offering a variety of competitive weapons for potential reactions in unpredictable, dynamic and volatile environments.

For the above mentioned mechanisms to work, certain resources and capabilities need to be available or developed on *individual* level. While obviously, resources and capabilities are logically prior to the firm's activities, resources can also be a product of a firm's unique set of activities (Spender, 1994, S. 359). However, regardless of what resources and capabilities a firm possesses, 'it is never the resources themselves that are the inputs to the production process, only the services that the resources can render' (Penrose, 1959, p. 25). This stresses the important difference between a resources latent market potential and the realized market potential achieved through market activities. Chrisman et al. coin this 'competitive weapons', and explain them as "the primary ways the organization applies its skills and resources to meet environmental needs and create enduring competitive advantages" (Chrisman, Hofer, & Boulton, 1988, p. 415). Consequently, a firm's competitive advantage is less dependent on resources and capabilities a firm owns per se, but rather on its way of deploying them in the market. Analyzing origins of sustainable competitive advantage on individual level must therefore start with identifying a firm's applied competitive weapons and based on that deducting the underlying resources and capabilities. Accordingly, HS sustainability rests primarily on the complexity of combining multiple competitive weapons within the same activity system and only secondarily on (co-specialized) individual assets, resources and capabilities.

In summary, HS sustainability depends on identifying generic strategy concepts, analyzing their applicability in a firm's specific context and environment, and, fit assumed, adopting and applying the firm's activity system accordingly. Consequently, HS, not just elaborate consistent hybrid generic concepts, but require a firm's management to specifically appraise the concept's firm level adoption on the basis of necessary competitive weapons and the corresponding resource portfolio, its institutional context and its environmental characteristics. Thus, sustainable HS necessitate fit and integration across all implementation layers. Ergo, it is not enough having the intention to be hybrid, rather it is compulsory to have the necessary resource potential and the ability to transfer them into market perceived and valued activities. Therefore, the above mentioned construct is focused on *realized* strategies in the sense of observable patterns in a stream of activities reflected in resource deployment (Mintzberg, 1978, p. 935; Spanos, Zaralis, & Spyros, 2004).

Besides this two, commonly shared characteristics, others are more disputed. The most important among them is Porter's concentration principle and its counterpart dimensionality (Porter, 1980; Campbell-Hunt, 2000).

The concentration principle postulates that firms need to concentrate on either one of Porter's two generic competitive advantages of cost or differentiation. Concentration, however, is not an objective of its own for developing and implementing strategies. Rather it is the consequence of assuming that competitive advantages sit on opposite sides of a spectrum and cannot be combined successfully. This contrasts to the principle of dimensionality, which is based on the exact opposite assumption, that competitive advantages are independent and combinations are feasible. Both principles are either assuming consistency or inconsistency in combining competitive advantage. As already explained, however, consistency depends on the level of analysis and thus cannot be generalized. Thus, the attempt to find a principally applicable consistency principle across collective and individual level might be one reason for the widespread theoretical and empirical ambiguity on this principle.

C.2. HYBRID STRATEGIES

The constituting characteristic of HS is the pursuit of multiple competitive weapons in the market place for combining competitive advantages simultaneously (Proff & Proff, 1997). From an activity perspective, these combinations arise from applying consistent concepts and adapting them firm specific and consistent. Literature on strategic management differentiates three types of HS: Management based, sequential and concurrent.

Management based types assume insolvable tensions resulting from ambidextrous strategic directions. Grounded on organizational theory it emphasizes management capabilities and organizational design. Based on the underlying assumption of managing inevitable tensions, however, this type neglects the consistency principle. In addition, sustainability mainly rests on a firm's unique organizational design and its distinctive management capabilities. Moreover, this type suppresses consistent concepts and implementations. For these reasons, management based HS are excluded from the scope of this research.

In comparison, sequential and concurrent HS base combinations of multiple competitive advantages on consistent but different concepts (Zellner & Butel, 2013). While sequential HS imply enhancing competitive advantages synergistically one after the other, concurrent types achieve those combinations coinstantaneously. Furthermore, the underlying theoretical foundations vary between sequential and concurrent types. While systems theory is the basis for sequential HS, microeconomic theory is the basis for concur-

rent HS applying concepts of variety, quality or innovation positively affecting differentiation and cost concurrently. Figure 1 provides an overview on HS types.

Hybrid strategy type	Variants	Description	Theoretical grounding	Evaluation	
				Consistency	Sustainability
Management based hybrid strategy	Management based	Inevitable tensions between activities directed to multiple competitive advantages need to be balanced	Organizational and behavioral theory	Inconsistent, as strategic conflicts to be managed	Emphasis on management capabilities and organizational design
Sequential hybrid strategy	Sequential	Sequentially enhance competitive advantages	Systems theory	Consistent, no strategic conflicts occur through modular structures	Emphasis on operational and management capabilities required to implement strategic change
Concurrent hybrid strategy	Variety Quality Innovation	Concurrently achieve multiple competitive advantages	Micro economics	Consistent, applying concepts avoiding strategic conflicts	Emphasis on operational and management capabilities required to implement micro economic concepts

FIGURE 1: OVERVIEW HS TYPES

C.3. DETAILED ANALYSIS OF EMPIRICAL RESEARCH ON HS

The review is based on 34 empirical contributions on HS starting 1980 and ending 2012. As explained above, the management based HS type and the corresponding body of research on 'organizational ambidexterity' is excluded from this research as it violates the consistency principle.

The theoretical basis of the empirical research reviewed is either industrial economics (IE), the resource based view of the firm (RBV), or the strategy process school (PS). ABV is not included in empirical work so far. Research on generic strategies is coded, even if not explicitly stated in the literature reviewed, as IE. Correspondingly, research intending to uncover resources or capabilities are coded RBV, while differentiating between intended and emergent strategy patterns were used as an indicator for PS. The majority of contributions with 71% or 24 empirical studies are based on IE, followed by RBV with 26% or 9 studies. Only Parnell's study used strategy process thinking for empirically analyzing generic strategies' deliberate and emergent patterns (Parnell J. , 2000). In 94% of the empirical studies, the unit of analysis is explicitly stated and is unanimously an individual business unit of a diversified, multi-business unit company or a single unit company. This corresponds to the high amount of single industry-focused studies, which accounts for 50% of all contributions. The remaining studies included an average of 5.5 industries with a standard deviation of 12.6. Robinson and Pearce's study on the relationship of intended strategies and planning included with 60 industries covered the highest number in this review (Robinson & Pearce, 1988). The number of business units analyzed within each research is high and averages 255 with a median of 125. For research on that scale, typically, tools such as surveys are required for data collection and indeed, of the 9 researches using solely surveys for data collection 8 explicated the number of business units analyzed and 5 are marking the top with 599 business units or more. For example Spanos et al.'s

study on strategy and industry effects on profitability is based on the Greek manufacturing data base and includes 1921 business units – the highest number of the literature sample (Spanos, Zaralis, & Spyros, 2004). In addition to pure surveys, which accounted for 26%, the most frequently applied method was collecting primary data with questionnaires (35%) followed by primary interviews (9%). However, in about one third of the studies combinations of methods are applied. Most frequent combinations are found for primary questionnaires and secondary surveys (21%) followed by primary interviews and questionnaires (6%). Combining all three methods is rare and only applied in three percent of all studies. The 34 empirical studies use factor, cluster, regression, correlation, variance and meta analysis as well as causal modelling. 65% of all studies used one of the first three analysis tools (FA 29%, CA and RA each 18%), the rest does not account for more than 6% individually. However, similarly to methods in data collection, combinations of analysis methods are used. The research period is, however, less conclusive as almost one third of studies did not explicate the research period. Only two of the remaining state an explicit period of one. The rest has an average longitudinal cut of 3.8 years, with a median of four and a standard deviation of almost two. The longest period with 10 years cover Leitner and Gueldenberg in their study on generic strategy and strategic change (Leitner & Güldenberg, 2009). The strategy construct is operationalised by variables ranging from a minimum of three to a maximum of 42 with an average and mean of 16 and a standard deviation of nine. Thus, strategies are typically empirically measured by a small amount of high level strategy variables. An example of this is Beal and Yasai-Ardekani's study on the relation of competitive strategies and management functional expertise (Beal & Yasai-Ardekani, 2000). In this study, the strategy construct is empirically measured by strategy variables such as R&D of new products, marketing of new products, selling high priced products or building brand or company identification (Beal & Yasai-Ardekani, 2000, p. 744). The following figure 2 presents an overview on the empirical literature analysis. Appendix 1 presents the full analysis on all 34 empirical studies.

Review criteria		Amount of publications (n=34)	Description
Theoretical basis *(n=34)*	Industrial economics	24	IE strongly attached to research on HS due to its origins in generic strategy concepts
	Resource based view	9	RBV successively entered discussion on HS from1988
	Process school	1	Only one contribution including process school's differentiation of intended and emergent strategies
	Activity based view	0	ABV not yet applied in context of HS
Research philosophy *(n=34)*	Positivism	34	Research on HS exclusively oriented to positivism
	Realism	0	Not yet applied
	Subjectivism	-	Not applicable as philosophy incapable of identifying HS patterns
Research method *(n=34)*	Quantitative	34	In accordance to dominant positivist paradigm empirical research purely coined quantitatively
	Qualitative	0	In-depth approaches such as case studies or experiments not yet applied
Data collection and analysis *(n=44)*	Primary data	28	Majority of primary analyses used large scale surveys (n=22); interviews comparatively low (n=6)
	Secondary data	16	Use of secondary data analysis typically combined with primary (n=10); only 6 purely secondary
	Factor analysis	13	Mainly used in quantitative HS research for identifying unobserved variables
	Cluster analysis	9	Intensely used for classifying HS by a numerical taxonomy
	Regression analysis	7	Typically applied in HS research for identifying relation between strategic variables and performance
	Correlation analysis	3	Used for evaluating dependence of classes of strategic variables with strategic dimensions
	ANOVA	3	Applied to testing if means of several strategic or contextual variables and performance are related
	Causal modeling	1	Elaborated for testing the impact of four high level strategic variables on ROI
Hybrid sources *(n=16)*	Resources	0	Resources not considered essential in achieving and sustaining HS
	Capabilities	13	8 studies identified meta or general and 5 specific capabilities
	Activities	2	Composition of value chain
	Competitive sequence	1	Order of market entry

FIGURE 2: OVERVIEW ON ANALYSIS OF EMPIRICAL HS STUDIES

On average, the studies identified combinations of competitive advantages in 18% of all business units included, with a median of 20% and a standard deviation of nine. The highest percentage of HS within a sample identified White with a combination of questionnaire and secondary data analysis using the PIMS database applying variables of relative product quality, image, breadth and new products (White, 1986). Thus, 19 companies of the 69 appeared to combine cost and differentiation advantages and achieved an ROI higher than 30%. Moreover, with 44%, almost half of all research studies identified and described 'hybrid' resources, capabilities and activities either on a specific or general level. 54% of these studies identified meta or general capabilities, followed by specific capabilities and a firm's activity system with 33% and 14% respectively. In only one case, early market entry with 95% of HS being pioneers or early entrants is identified as vital for HS (Miller & Dess, 1993). Interestingly, none of the analyzed researches regards resources, no matter if specific or general, crucial for achieving and sustaining HS. Figure 3 provides an overview on the identified sources of HS.

Sourcres of HS	Description	Author
Meta or general capabilities	Quality and synergy management	Miller & Friesen, 1986
	Integration of conflicting orientations	Miller, 1987
	Capability to manage strategy and resource needs	Reitsperger et al., 1993
	Management of strategic consensus, integrative strategic understanding, aligned strategy formulation and implementation	Kotha et al., 1995)
	Develop distinctive competencies - the more the better	Wright et al., 1995
	Management consensus	Bowman & Ambrosini, 1997
	Strong management and technology capabilities	Parnell, 2011
	Mediating role of organizational complexity, formalization, decentralization	Claver-Cortés et al., 2012
Specific capabilities	Planning sophistication	Robinson & Pearce, 1988
	Investment and risk management	DeCastro & Chrisman, 1995
	Production capability, flexibility, continuous improvement	Yamin, Gunasekaran, & Mavondo, 1999
	Accounting experience a pre-requisite, combination of research and development, marketing, sales and engineering essential for achieving hybrid strategies	Beal & Yasai-Ardekani, 2000
	Marketing expertise, production flexibility and speed	Parnell., 2000
Activity system	Primary activities locally dispersed; central support	Roth & Morrison, 1992
	Consistency of value chain	Reitsperger et al., 1993
Competitive sequence	Early market entry as pioneers or early entrants	Miller & Dess, 1993

FIGURE 3: EMPIRICALLY IDENTIFIED SOURCES OF HS

C.4. DETAILED ANALYSIS OF THEORETICAL RESEARCH ON HS

16 theoretical research contributions on HS are reviewed in a range from 1984 to 2001, with a median of 1988. Seven different theories mark the basis for theoretical research on HS, with contingency theory used for 25% of all contributions. Of these contingency-based contributions, 80% are from 1988 or earlier and identify internal or external contingencies relevant for achieving HS. Gilbert and Strebel's sequential HS, for example, consider the industry lifecycle a key contingency (Gilbert & Strebel, 1985). Similarly, Hill interrelates the impact that differentiation has on demand to "three major contingencies: the ability of the firm to differentiate its product, the competitive nature of the product market environment, and the commitment of consumers to the products of rival firms" (Hill, 1988, p. 404). Moreover, Murray assumes that strategic viability depends on the presence of a number of environmental preconditions (Murray, 1988).

Cost theory – in most cases a combination of both, production and transaction cost – is founding the basis for 20% of all theoretical research reviewed. These researches argue that differentiation has positive and negative impacts on a firm's overall cost position and consequently, total cost effects on differentiation can be positive. According to this argument, differentiation expands demand, raises market share or allows price increases, enlarge production volume and leads to economies of scale (Karnani, 1984). Similarly, a broader market or product scope provides the basis for economies of scope. However, as transaction cost are a function of the complexity of its product and market choices differentiation also raises transaction cost (Jones & Butler, 1988). Accordingly, for HS to be successful the beneficial cost effects from differentiation must outweigh the additional cost. Following this argument, Jones and Butler infer

from production and transaction cost a firm's total cost function and argue that "firms will differentiate their products and markets to the extent that minimizes the sum of production and transaction costs" (Jones & Butler, 1988, p. 207). Contrary, Belohlav's investigation of the relationship of quality and cost focuses purely on production cost or more specifically on total cost of quality (Belohlav, 1993). In this notion, failure not quality is expensive, as it leads to losing customers and require operating the 'hidden plant', meaning 'people, floor space, and equipment used for nothing but finding and fixing things that should have been done right the first time' (Belohlav, 1993, p. 60). Consequently, Belohlav concludes that 'well-organized quality initiatives are not just cost effective but are also the most cost effective strategies for an organization' (Belohlav, 1993, p. 61). Additionally, three theoretical works develop new conceptual frameworks based on existing generic or manufacturing strategy classifications (Chrisman, Hofer, & Boulton, 1988; Kotha & Orne, 1989; Faulkner & Bowman, 1992). Chrisman et al. for example develop a classification system for "realized" business strategies by evaluating the strengths and weaknesses of the widely cited schemes of Porter and Abell (Porter, 1980; Abell, 1980; Mintzberg, 1978). Taxonomically analyzing the dimensions of 'presence of segment differentiation', 'type of competitive weapon accounting for business revenues', and 'scope' leads them to derive "utility strategies", which "represent businesses that use cost and benefit weapons simultaneously in their principal product and market segment or segments" (Chrisman, Hofer, & Boulton, 1988). In a similar approach reclassifying generic manufacturing strategies along the three primary dimensions of 'process structure complexity', 'product line complexity', and 'organizational scope' Kotha and Orne characterize industry-wide, cost and differentiation strategies by "very high organizational scope (scale), complex product lines, and production processes that are highly integrated" (Kotha & Orne, 1989, p. 226). Furthermore, two theoretical researches are based on analyzing cost, revenue and profit impacts of HS. In this microeconomic tradition, Wright found a positive relationship between market share and ROI. Thus, larger firms can compete either on cost or on differentiation and are likely to choose "the one which seems to them to have the better prospects for profitability, given the characteristics of the industry in which they compete" (Wright, 1987, p. 100). Moreover, following this line of argument, Fleck characterizes concurrent HS types as positively affecting both parts – cost and price – of the microeconomic profit function (Fleck, 1994). Proff and Proff & Proff are following the same approach, however further explaining hybrid value chain concepts. Accordingly, HS are based on decoupling value chain activities and directing individual activities on either cost or differentiation advantages (Proff & Proff, 1997; Proff, 2000). In this notion, Proff argues that a strategic

separation between decreasing cost and growing customer benefits along the value chain is possible by focusing the first on cost-oriented downstream activities and the later on sales-oriented upstream activities (Proff, 2000). Game theory, which initiated the theoretical discussion on HS, is only applied once. In Karnani's view competitive strength results from an appropriate combination of differentiation and cost. This is in sync with the empirical findings of Hall, who concluded that firm's deliver at lowest cost with acceptable quality or highest differentiation with acceptable cost (Hall K. H., 1980). Consequently, competitive advantages are combinable and thus, Karnani concludes, "it seems more appropriate to think of differentiation and cost position as dimensions of competitive strategy rather than generic competitive strategies" (Karnani, 1984, p. 378).

Next, a detailed quantitative review on theoretical research on HS is presented. 75% of all reviewed research uses independent cost and differentiation dimensions for combining competitive advantage. The remaining assumes a continuum along one single cost dimension. Based on that strategy constructs, 65% theoretically infer concurrent HS, while only 29% derive inconsistent management based HS. Conclusions regarding managing cognitive dissonances are an indicator for inconsistent management based HS. Only Gilbert and Strebel's outpacing strategy based on industry lifecycle concept presents a way to avoid such conflicts by sequentially adding one competitive advantage after the other (Gilbert & Strebel, 1985). As mentioned above, the underlying effects providing HS basis are cost and differentiation. In 86% of all cases, the key argument is that differentiation generates positive cost effects through increasing sales quantity. Thus, cost effects resulting from that are scale economies (41%), direct cost (38%), scope economies (31%) and learning curve effects (17%). Contrary to this relatively abstract cost effects, the most recent researches included in this review show an interest in further detailing the underlying cost effects resulting from quality (14%) and innovation (10%) (Belohlav, 1993; Fleck, 1994; Proff & Proff, 1997; Proff, 2000). In line with this reasoning, prices are either a legitimation for differentiation (56%), an indication for cost leadership, implicitly assuming minor quality (33%), or competitive weapons, underpinning the fact, that possessing the before mentioned competitive weapons per se is not sufficient. Rather, they need to be applied in the market field (11%). Figure 4 presents an overview on the theoretical literature included in this analysis. In addition, Appendix A.2 provides an overview on the analysis of theoretical literature.

Review criteria		Amount of publications (n=16)	Description
Theoretical basis *(n=20)*	Contingency theory	5	HS depend on specific contingencies, such as industry or product lifecycle
	Production cost theory	4	Differentiation increases demand and market share, allows price increases, enlarge production volume and
	Transaction cost theory	3	leads to economies of scale and scope; complexity of product and market choices can raise transaction cost
	Taxonomical analysis	3	New conceptual frameworks based on existing generic or manufacturing strategy classifications
	Microeconomics	2	Detailed analysis of impact HS has on cost, revenue and profit
	Value chain analysis	2	Cost and benefit impacts assigned to different value chain activities
	Game theory	1	Strategy involving high differentiation and high market share is consistent
Strategy construct *(n=16)*	Independ. dimensions	12	Different competitive dimensions allow combinations of cost and differentiation
	Continuum	4	Production and / or transaction cost along a single continuum; differentiation effects decreasing cost
Identified HS *(n=17)*	Concurrent	11	Concurrently achieve multiple competitive advantages
	Management Based	5	Potential cognitive dissonance applied as indication for management based HS
	Sequential	1	Sequentially enhancing competitive advantages
Underlying competitive mechanisms			
Cost effects *(n=29)*	Scale effects	12	Differentiation driven market share increase leads to economies of scale
	Direct cost effects	11	Differentiation increases cost; but market share positively affects e.g. purchasing, funding , channel access
	Scope effects	9	Differentiation through market and product range leads to scope effects
	Learning curve	5	Differentiation increases market share and leads to cumulative efficiency effects
	Quality effects	4	Quality reduces the incidence of defects and lowers costs (economies of quality)
	Innovation effects	3	(Incremental) innovation allows short run monopoly and shorter development times (economies of speed)
Differentiation effects *(n=14)*	Quantity	11	Quantity positively impacting production and transaction cost
	Quality	2	Quality reducing production and transaction cost
	Diversification	1	Diversification generating scope effects
Price effects *(n=9)*	Diff. legitimates price	5	Price indicates differentiation advantages
	Price compensates cost	4	Price indicates cost leadership
	Price is comp. weapon	1	Price as competitive weapon, which applies cost advantages
Hybrid sources *(n=11)*	Activities	8	Composition of distinct value chain activities
	Capabilities	3	Only general or meta capabilities identified
	Resources	0	Resources not considered essential in achieving and sustaining HS

FIGURE 4: OVERVIEW ON ANALYSIS OF THEORETICAL HS CONTRIBUTIONS

More than half of all theoretical research papers identified and described ‘hybrid sources’ (63%) with a majority determining a firm’s activity systems as essential (73%). Furthermore, the three remaining theoretical works determined general but no specific capabilities. The theoretical findings on resources confirm the above mentioned empirical findings, as neither general nor specific resources are considered vital for combining competitive advantages. Figure 5 provides an overview on theoretically identified sources of HS. The group determining a firm’s activity system an essential source for HS shares the idea of decomposing the value chain and focusing individual activities on different competitive advantages. On an aggregated level, thus, combinations of competitive advantages are feasible. However, differences exist on how such an approach can be consistently applied within a firm’s activity system. Altogether, five cases (71%) predict cognitive dissonances from combining various individual foci within a firm’s overall value chain (Wright, 1987; Wright & Parsinia, 1988; Faulkner & Bowman, 1992). Only one of them provides a basis for managing these conflicts by sequentially ordering strategic foci in time (Gilbert & Strebel, 1985). The remaining 29% or two cases assume concepts consistently orchestrating value chain activities. Such a ‘management view’, however, requires according to Proff and Proff & Proff a separation between the growth of costs and the growth of benefits along the value chain. One important prereq-

uisite for such a separation is that "customers put a greater value on some of the elements in the value chain than on others, and if this then leads to a bigger increase in benefits but not, at the same time, to a bigger increase in costs" (Proff, 2000, p. 546). The group of theoretical research identifying meta or general capabilities consists of three and range from 'managing efficiency, quality and just-in-time production', over 'managing total quality; cross functional, process oriented organization', to 'managing synergy, quality, time, complexity and flexibility' (Hill, 1988; Belohlav, 1993; Fleck, 1994).

Sources of HS	Description	Author
Activity system	Decomposing value chain; cognitive dissonance; sequential ordering	Gilbert & Strebel, 1987
	Decomposing value chain; cognitive dissonance	Wright, 1987
	Decomposing value chain; cognitive dissonance	Murray, 1988
	Decomposing value chain; cognitive dissonance	Wright & Parsinia, 1988
	Decomposing value chain; cognitive dissonance	Faulkner & Bowmann, 1992
	Consistently managing value chain activities	Proff & Proff, 1997
	Consistently managing value chain activities	Proff, 2001
Meta or general capabilities	Managing efficiency, quality and just-in-time production	Hill, 1988
	Managing total quality; cross functional, process oriented organization	Belohlav, 1993
	Simultaneously managing synergy, quality, time, complexity and flexibility	Fleck, 1995

FIGURE 5: THEORETICALLY IDENTIFIED SOURCES OF HS

Next, inferring from the above literature review leads to research issues, which in turn will define the research objective of this research.

D. RESEARCH ISSUES

The major research issue results from the gap of establishing either empirical or theoretical evidence of HS or their practical realization. It remains unclear what are the underlying concepts allowing a few firms to establish HS successfully. More specifically, the question of what activities and what resources or capabilities is essential for providing an answer to how to combine competitive advantages successfully. The current state of empirical research on HS only partially covers resources and capabilities, and completely lacks the view on firm activities.

Therefore, a first issue in the current state of empirical research is the degree of explaining how HS occur. In critical realist terms, establishing a relationship between strategy type and performance addresses only the empirical level. This leaves the actual and the real level necessary for explaining the underlying mechanisms undiscovered. Thus, activities located in the real domain cannot be linked directly to firm performance (Johnson, Leif, & Whittington, 2003). Rather, they explain the configuration of resources and capabilities and allow analyzing their engagement in a specific competitive environment (Johnson, Leif, & Whittington, 2003). This, however, covers only half of the story of HS outstanding performance, namely the internal perspective. The internal perspective provides insights into the adaptive capacity of

(re-)configurating a firm's activity system and its capability and resource portfolio according market needs. However, *mechanisms of how* HS firms achieve their outstanding performance through activities, resources and capabilities. Thus, a link between activities, capabilities and resources and the genesis of competitive advantage as the driver of firm performance - defining the absorptive capacity of the firm - needs to be established on the real level. As quantitative methods still dominate that field of empirical research, more qualitative research is required. The missing application of ABV for discovering consistent concepts and implementations underpins this fact (Allen & Helms, 2006).

Furthermore, the literature review reveals a gap in the main sources of HS between empirical and theoretical research. While empirical research finds capabilities the main sources of HS, theoretical works emphasise activities. Additionally, most theoretical works' activity systems argument is based on managing dissonances resulting from combining contradictory activities. However, such *management based HS* are inconsistent, what necessitates further research identifying consistent HS concepts and implementations with activities as the level of analysis. Additionally, more qualitative methods are required for understanding the deep structures of HS. Bridging these gaps is the aim of this thesis.

Consequently, this research aims at identifying consistent concepts of HS and determining the underlying activities, capabilities and resources required for successfully implementing and operating them.

III. THEORY OF HYBRID STRATEGIES (HS)

As described above, only two categories of consistent and sustainable HS types – sequential and concurrent ones – exist (Zellner & Butel, 2013). In the following, an overview on each category is provided. Additionally, for each category HS types are described as well as their theoretical foundation and concept explained. Moreover, for each HS type a profile consisting of the underlying concept and activity drivers, as well as activities, capabilities and resources is developed. Finally, similarities and differences in activity drivers, activities, capabilities and resources of the different HS types are identified in order to synthesize a model comprising the entirety of strategic variety of HS.

A. TYPES OF HS

A.1. SEQUENTIAL HYBRID STRATEGIES (SQHS)

SQHS or 'outpacing strategies' combine competitive advantages by extending strategic focus over time (Gilbert & Strebel, 1985). Its basis is a dynamic strategy concept, matching or aligning organizational resources with environmental opportunities and threats (Venkatraman & Camillus, 1984). The major part of research on SQHS is empirical and based on the relationship between a firm's adaptability and its achieved performance (McKee, Varadarajan, & Pride, 1989; Snow & Hrebiniak, 1980). In essence, the key notion of SQHS is, that "… success results not from the single-minded pursuit of either strategy but from the ability *to add one to the other at certain stages* in the evolution of the market ...." (Gilbert & Strebel, 1985, p. 29).

However, key to success of SQHS is to identify the requirement, time and degree of strategic enhancements, all mainly determined by the limits of pure strategies (Zellner & Butel, 2013; Fleck, 1994). March considers general limitations of exploitation by too much focus to the exclusion of exploration, which leads to competency traps, inertia, and finally obsolescence. Contrary, too much exploration to the exclusion of exploitation leads to failure traps, leaving firm's not gaining returns on their knowledge (March, 1991, p. 71; Simsek, Heavey, Veiga, & Souder, 2009). More specifically, strategic limitations can either originate from internal or external factors of a firm. External limitations on, for example, Porter's pure differentiation strategy are a lack of customer perception on increased product quality, or missing consumer price acceptance on incremental innovations (Knyphausen & Ringlstetter, 1991, p. 553). Both of these examples lead to a marginalization of differentiation efforts at potentially higher cost of production or transaction. Internal limitations on Porter's cost leadership are, for example, marginal benefits arising

from additional investments in mature technologies, or too low initial investments generating economies of scale only insufficiently (Kloock & Sabel, 1993). Accordingly, Booth and Philip empirically find "… the emphasis was more on mix and match combinations of cost, differentiation, and other incentives, rather than on any one generic posture. Such a multidimensional stance represents a change in the way companies are responding to a changing marketplace, changing customers, and ever more competitive and complex industries." (Booth & Philip, 1998, p. 37)

Changes in a firm's organizational and environmental factors are the main drivers of successively extending competitive advantages and determine the degree of adaptation necessary. Zajak and Shortell develop a model of dynamic fit based on two dimensions: Change required and change implemented (Zajac & Shortell, 1989, p. 431). They distinguish two 'dynamic fit' types, 'beneficial change' and 'beneficial inertia', from two 'dynamic misfit' types, 'excessive change' and 'insufficient change' and conclude that change is only one way of successfully handling contingencies, while another is inertia. This is true on organizational as well as on individual level. Companies use flexibility on organizational level for improving their competitive position and their adaptability in volatile markets, while simultaneously using stability to reduce uncertainty. Similarly individuals seek predictable relationships and stability in behaviour while simultaneously looking for variety and stimulation in organizational life (Leana & Barry, 2000). This indicates complementary relationships on organizational and individual level and considers both dynamic fit types as concurrent forces affecting organizational actions (Connor, 1999). Furthermore, this specifies the activity system as the adequate unit of analysis for SQHS. Due to the sequential achievement of multiple competitive advantages, effectively attaining one, say differentiation, provides the basis for successfully utilizing another. In detail, achieving differentiation through fulfilling customers demand for an innovative product better utilizes production capacity and increases scale economies (Parnell J. A., 1998, p. 30). Thus, a consistent and sustainable model of SQHS has to pursue beneficial change and inertia simultaneously on an activity system's level, with the premise that beneficial change compensates all associated costs and risks of changing. Only if the sum of all effects is positive SQHS is outperforming singular and no-emphasis strategies. Otherwise, the firm is stuck-in-the-middle (Porter, 1980).

A.2. CONCURRENT HYBRID STRATEGIES (CHS)

Compared to SQHS, CHS differ in two ways: First, combinations of competitive advantage are achieved in parallel, requiring underlying concepts positively affecting differentiation and cost advantages

at once and not sequentially one after the other. Second, contingencies are not the main reason to understand the underlying mechanism (Zellner & Butel, 2013). Rather, it is the way firms differentiate through variety, quality or innovation allowing them to *concurrently reducing costs and increasing customer satisfaction*. This way, indirect and direct cost reducing effects from differentiation can be distinguished (Fleck, 1994; Proff & Proff, 1997). Indirect cost effects from differentiation are similar for all differentiation types and result from economies of scale through increasing demand, which in turn pushes production volumes and increases economies of scale. Additionally, central to the concept of CHS is customer satisfaction, which can be defined as post-consumption evaluation depending on customer's perceived value (Yi, 1991). That way, customers must perceive HS' products or services as 'good value for money' despite being higher priced.

Contrary, direct cost effects depend on the type of differentiation. Cost reductions from variety originate from economies of scope resulting from "inputs that are shared, or utilized jointly without complete congestion. The shared factor may be imperfectly divisible, so that the manufacture of a subset of the goods leaves excess capacity in some stage of production, or some human or physical capital may be a public input which, when purchased for use in one production process, is then freely available to another." (Willig, 1979, p. 346). However, not all variety reduces cost; rather 'functional variety' or 'variety for sales' which is perceived by customers has positive cost effects through increasing sales and production volumes. Contrary, negative cost consequences occur from increased internal, technical variety driving firm complexity (Huffman & Kahn, 1998). Thus, technical variety costly to the firm "should be reduced [and distinguished] from functional variety that should be encouraged" (Jiao, Ma, & Tseng, 2003).

Quality on the other hand, positively influences direct cost by generating economies or economics of quality (Juran, 1951). The basic premise behind this mechanism is that spending more money on preventive quality leads to declining internal and external failure cost (Elshazly, 1999). According to this principle, companies can reduce their total cost by achieving a minimum of both preventive quality and failure cost (Turner, 1969). Consequently, economies of quality differ in cost effects resulting from preventive quality and operating quality management. While preventive quality allows for reducing non-value adding activities and thus the cost of the hidden plant (Miller & Vollmann, 1985), operating economies result from economies of scale and scope of utilizing freely available quality management resources and capabilities as a quasi-public input to multiple production or administrative processes.

In turn, positive cost effects from incremental compared to radical innovations are driven by economies of speed, scope and quality (Starr, 1992; Sommerlatte & Mollenhauer, 1992). Economies of speed originate from two different sources: First, shortened development times and second, fast availability and increased frequency of innovation both positively impacting market share and production volume (Gupta & Singhal, 1993; Banburry & Mitchell, 1995). As a result, research and development (RD) cost on the one hand and production and transaction cost on the other hand are reduced (Fleck, 1994). Moreover, economies of scope and quality result from utilizing not fully congested quasi-public resources and capabilities analogous to the above-explained quality and variety effects.

By achieving multiple competitive advantages concurrently cost and differentiation effects have to result from one and the same concept. Such concepts require directing a firm's activities towards multiple competitive advantages without causing inconsistencies in the overall activity system. Concepts providing such consistency are for example mass customization or quality function deployment (Fleck, 1994). For analyzing the consistency of the applied concepts, an activity system and activity level is mandatory as otherwise implementing some activities can thwart others causing inconsistent configurations (Zellner, 2011).

B. THEORETICAL FOUNDATION AND GENERIC CONCEPT OF SQHS

B.1. A GENERIC CONCEPTUALIZATION OF SQHS

Internal and external change drives SQHS. Following Ashby's 'law of requisite variety', systems efficiency depends on the degree of fit between a system's internal and external complexity (Ashby, 1956). As most firms have only limited impact on external factors, SQHS success depends on the adaptation of a firm's activity system, activities, resources and capabilities to its external environment (Zellner, 2011).

System theory provides two important insights for adapting activity systems sequentially: First, adaptation efforts should principally kept small and second, should be limited to few and independent system parts. While the first is determined by the fit required and is, as already mentioned, mainly externally determined, the second is driven by the system's architecture. System architectures differ according to the intensity of coupling its subsystems. While adapting tightly coupled subsystems can even lead to the necessity of a complete redesign, loosely coupled systems allow adapting certain subsystems, without compromising the overall architecture (Orton & Weick, 1990). Accordingly, system theoretically conceptualizing a SQHS combining beneficial change with beneficial inertia requires loosely coupled, modular

system designs and is applicable to any complex system such as products, processes, organizational structures, knowledge systems, or even customers' utility systems (Sanchez, 1995; Baldwin & Clark, 2000; Sanchez & Mahoney, 1996).

On aggregated level generic cornerstones of SQHS are modular product design and modular organization design. Modular product design supports SQHS by increasing product variety and adaptability through mixing and matching of components within existing product architectures. In addition, modular designs increase production volume of individual components reused across product variants, families and generations. Similarly, reuse of existing product architectures, interfaces and components foster efficiencies in a firm's value chain beyond manufacturing. Moreover, the reuse of existing architectural designs, interfaces and components create efficiencies through emphasizing architectural level and core components critical to overall product performance and customer perception.

Moreover, modular organization design fosters SQHS by substituting overt managerial authority through embedding coordination in standard interfaces between decentralized units (Worren, Moore, & Cardona, 2002; Henderson & Clark, 1990; Schilling, 2000; Sanchez, 1995). This generates adaptability through reconfiguring a firm's activity system, activities and its underlying portfolio of resources and capabilities by flexibly 'mixing and matching' organizational units. Modular organizational designs also increase learning through reusing and transferring knowledge between decentralized organizational units.

B.2. Linking SQHS competitive advantages, activity drivers, activities, capabilities and resources

For analyzing the competitive success resulting from the above outlined SQHS concept activity drivers need to be determined and linked to a firm's activity system and activities (Zellner, 2011).

Activity drivers are generic and structural. They are structural 'in the sense that they represent abstract, relative or relational properties of activities, both in the context of the firm and in the context of the business value system the firm operates in' (Sheehan & Foss, 2007, p. 453). Scale for example as a potential driver needs to be determined relative to the total product market volume and has to be considered in relation to the scale of other activities performed in the firm. This way, drivers determine the space of alternative positioning. They are abstract, as they need to be instantiated firm specifically. For scale, a firm specific decision is required in terms of the amount of output produced. Drivers affect the activity system in two ways: First, they can improve an activity system's efficiency and effectiveness and second,

improve the fit between activities within a firm's activity system. Typically, multiple drivers need to be balanced and made operational within several activities of the value chain. Quality for example has its requirements in product development, inbound logistics and research and development (RD), manufacturing, or outbound logistics, however the same functions are also affected by other drivers as for example scale or scope.

Links between activity drivers and activities are mutual and manifold. Variety as a driver spans the space of alternative positioning for example for marketing by determining how many product variants are offered to certain customers or segments. Based on that, firm management decides on the position a firm wants to occupy within the space of alternative positioning. For example, firms following a SQHS carry out a variety of supporting activities such as rapidly developing prototypes for real time market research based on modular product design. However, as seen in the example, variety impacts not only marketing but also other activities such as operations, firm infrastructure or technology. Conversely, the activity decoupling product design from technology on architectural level for example increases differentiation by fostering variety and simultaneously improving efficiency through less research cost per variant. In consequence, drivers and activities are not tightly bonded but form systems, which need to be aligned with each other. Therefore, the identification of (groups of) activities impacting multiple drivers concurrently is the key prerequisite of HS in general and SQHS in particular. According to Porter's value chain framework activities are differentiated in primary activities, directly influencing value generation, and support activities, only indirectly impacting drivers by affecting the performance of primary activities (Porter, 1985). Primary activities consist of inbound logistics, operations, outbound logistics, marketing, sales and services. Secondary activities consist of firm infrastructure, human resources, procurement and technology management. However, despite its broad acceptance and frequent usage, Porter's value chain is mainly applied to analyses of strength and weaknesses in academic research, while first- or second-order analyses are rare (Hax & Majluf, 1992; Stabell & Fjeldstad, 1998). First-order analyses are used to assess the most important activities in terms of cost and value. Second-order analyses are more detailed and are used to uncover structural activity drivers behind activities. For this research a two-tiered second-order analysis is applied on activity drivers and core activities, which sufficiently satisfies a strategic and management perspective (Stabell & Fjeldstad, 1998, p. 413). While, however Porter unnecessarily limits value chain analyses to the activity level as the smallest possible entity, in this paper resources and capabilities as the ammunition of activity based 'weapons' are added as elementary units of analysis.

In the following, first, differentiation and cost drivers of SQHS are discussed before; secondly, core activities and their interdependencies are identified.

B.2.1. Competitive advantages and activity drivers of SQHS

Differentiation drivers and advantages

Major differentiation drivers of modularity are increasing variety and flexibility. *Product variety* increases the diversity of product functions, characteristics, and performance specifications (Dickson & Ginter, 1987; Sanchez & Mahoney, 1996). Variety improves positioning to heterogeneous customer preferences compared to integrated product designs and allows serving many more market segments than competitors not capable of designing modular products (Dickson & Ginter, 1987; Sanchez & Sudharshan, 1993). Furthermore, modularly adapted and updated products reduce the time to market of modified or new products. Besides this primary differentiation aspect, modular product architectures reduce test, change and adaptation costs for customers by requiring only certain components to be replaced if products advance and thus lowering production and transaction cost (Nobeoka & Cusumano, 1997; Baldwin & Clark, 2000; Sanderson & Uzumeri, 1995; Schilling, 2000, p. 321). By this, customers are enabled to participate in component based technology innovations, while only carrying the cost of adapting its current product configuration. This also founds the basis for continuous improvements (Sanchez, 1996, p. 128; Sanchez & Sudharshan, 1993). Last but not least, modular product design provides the basis for real time learning by leveraging product variants for market research and product adaptation according to customer needs (Sanchez & Sudharshan, 1993, p. 130).

Flexibility can be differentiated in mix, changeover and modification flexibility (Gerwin, 1993). Mix flexibility results from composing products from a modular set of components (Sanderson & Uzumeri, 1995). Changeover flexibility is achieved by applying existing product designs, as development platforms for new product families and models or reusing components across product families and generations (Gerwin, 1993). Modification flexibility is based on altering certain components, while obtaining the overall product architecture and unmodified components (Wheelwright & Sasser, 1989). In any case, flexibility avoids customers from partial or complete obsolescence, as only some components of for example a production line can be exchanged instead of complete machinery. Hence, reducing customers' investment requirements and transaction cost.

Cost drivers and advantages

Before discussing cost drivers, economies of substitution as a central cost element of modularity need to be described. They occur if "(…) the cost of designing a higher-performance system through the partial retention of existing components is lower than the cost of designing the system afresh" (Garud & Kumaraswamy, 1995, p. 96). Substitution economies differ from economies of scope in terms of its origins. While economies of scope result from using capacities of 'quasi-public' goods, which otherwise would remain unexploited (Kloock & Sabel, 1993), economies of substitution are based on fully separable, autonomous inputs, which are designed to provide variable output capacities. Thus, economies of scope use 'variations of alternative input capacities' for alternative applications, while economies of substitution use 'variations of standardized output capacities' for alternative applications (Kloock & Sabel, 1993). In consequence, scope economies are factor input oriented while substitution economies are factor output oriented. Based on this, positive and negative cost effects as well as risks of modularity can be discussed.

For a concept to be 'hybrid', it is obligatory to combine differentiation with positive cost effects. While differentiation is mainly driven by product and service characteristics, costs are impacted by product and organization design. *Product oriented cost drivers* of modularity are scale and capacity utilization, agility and lead time reductions as well as substitution and make or buy decisions.

For manufacturers modular product designs generate economies of substitution in product development, testing and quality assurance per product variant (Sanchez, 1995; Garud & Kumaraswamy, 1995, p. 96). Also, modular product architecture provides the basis for increased 'manufacturing agility through altering the degree of machine flexibility and mix flexibility and higher value of manufacturing agility leads to shorter manufacturing lead time' (Watanabe & Ane, 2004). Thus, by modularity agility is raised reducing manufacturing lead-time. Additionally, combinational learning leads to incremental product innovations and improvements as well as reductions in development, test and quality costs (Kloock & Sabel, 1993). Furthermore, set-up costs are reduced or even avoided for all sustained components (Garud & Kumaraswamy, 1995, p. 96). Continued architectures, interfaces and components lead to a component based increase of economies of scale in production and purchasing (Sanchez, 1996, p. 129). Thus, available capacities in manufacturing as well as in marketing and sales (MS) can be better utilized. Beyond that, 'delayed differentiation', through adding differentiation relevant components late in the delivery process generate cost advantages in inventory and assembly (Zangwill, 1993; Lee & Billington, 1993; Hau & Tang, 1997). Also modularity's emphasize on architectural level and core components, which are

critical to overall product performance and customer perception, generate value chain efficiencies through supporting decisions on make or buy. (Sanchez & Mahoney, 1996, p. 72) Finally, market and competitor imitation risks are reduced by increasing product flexibility and adaptation to customer preferences, as well as shorter product development cycles (Sanchez, 1996, p. 129; Baldwin & Clark, 2000).

Organizational cost drivers are often determined by a company's product design choice meaning that modular product manufacturers often structure their organization modularly as well (Sanchez & Mahoney, 1996, p. 131; Worren, Moore, & Cardona, 2002, p. 1126). The major modular organization cost drivers are substitution, strategic adaptability and learning.

By decoupling relatively autonomous units and linking them through pre-specified, standardized interfaces modular organizations use 'embedded coordination' and substitute overt, managerial authority (Orton & Weick, 1990). Consequently less management capacities are required and coordination and transaction costs decline (Sanchez, 1995, p. 146). The product oriented principle of 'mixing and matching of components' applies also to a modular organization's independent and reusable units. Thus, recombining and reconfiguring independent organizational units generates organizational flexibility and economies of substitution, if change can be located on the level of groups or individual units (Teece, Pisano, & Shuen, 1997, p. 520; Sanchez, 1995, p. 154). Moreover, economies of substitution result from knowledge sharing, compared to knowledge 'hoarding' in traditional hierarchical structures (Garud & Kumaraswamy, 1995, p. 98).

Next to the above mentioned positive impacts on cost drivers, modularity produces also *negative cost effects* compared to traditional designs. Costs are negatively driven through costs of increased complexity and diseconomies of substitution on both, product and organizational level. Modularity's higher level of variety and complexity increases coordination costs. Lateral integration of 'in-house' produced components and vertical integration of externally supplied components raise management coordination efforts. Additional coordination costs also occur as management's cognitive complexity expands through allocating scarce resources on partly competing activities (Teece D. J., 1980). Diseconomies of substitution primarily result from increased development and coordination efforts. Development costs rise because of increased design requirements (Garud & Kumaraswamy, 1995, p. 100). In addition, specifying and aligning interfaces between autonomous units and components as well as developing potentially over dimensioned modular architectures is relatively costly compared to traditional, integrated designs. Moreover,

cumulative search and test costs are higher as the total amount of product components and variety rises. (Banker, Datar, & Kemerer, 1993).

Summarizing, modular product and organization design is a necessary, but not sufficient prerequisite for SQHS. Rather, the net result of the corresponding production and transaction costs of all product lines and variants determine the success of SQHS. This directs the discussion on a firm's activity system as a concrete manifestation of SQHS generic concept and activity drivers.

B.2.2. Determining SQHS core activities, capabilities and resources

Contrary to the relationship of drivers and activities shaped by alignment, activities and resources are bonded by the nature of activities engaging resources for achieving a firm's objectives. Moreover, activities not simply employ resources; they also can shape existing ones or create new ones. Principally, many activities and resources are similar in traditional and modular design. However, some core activities and resources differ and are therefore emphasized in the following discussion (Hamel, 1994). SQHS *core primary activities* are located in RD, purchasing, operations, outbound logistics and marketing.

In purchasing hybrid core activities relate to make or buy decisions and are based on the capability of identifying core components within product architectures or core units within organizational structures (Garud & Kumaraswamy, 1995, p. 97). In turn, this is determined by capabilities in marketing, product design and operations. In marketing the capability rests on real-time market research and competitor and market analysis, while product design provides the basis for modularity and thus variety, and operations is capable of providing rapid prototypes (Wheelright & Clark, 1992). With this knowledge firm's identify non-core components or units, evaluate competitors' and suppliers' corresponding performance and decide whether to externally supply or internally produce the components or services. In consequence, the selection of capable partners is one core purchasing activity for SQHS.

In RD and operations, core activities are integrating and managing outsourced component and service provision, design product architectures decoupling architecture and technology development, rapidly design and reuse modular architectures for products and organizations, as well as reuse architectures, interfaces and components. While in purchasing, potential partners are evaluated and selected, in operations external partners are operationally integrated and managed in order to meet pre-specified requirements and service levels. Moreover, designing modular product architectures is an essential activity of SQHS. Such architectures contain a complete information structure defining 'required outputs of compo-

nent development processes before beginning development of components' (Sanchez & Mahoney, 1996, p. 70). While basic knowledge on technology is necessary for designing architectures, technology development typically manifests on component level. Therefore architectural design and basic technology capabilities are a prerequisite of HS based modularity. Similarly strong competencies in technology development on core component level are required. Rapid prototyping as another core activity in RD founds the basis for real-time market research. Furthermore, testing and developing modular architectures and components are core activities in RD. This requires sufficient upfront investments in complex modular product architectures with costly interface definitions and over dimensioning. Correspondingly, capabilities are required in modular and experimental product design, interface specification and alignment as well as in search and reuse of knowledge and existing modular product architectures, components or interfaces as well as adaptable organizational units. Similar, to RD in manufacturing capital investments in production facilities are required to provide the basis for generating sufficient scale economies (Kloock & Sabel, 1993). This is necessary as the volume increasing effect of differentiation generate the potential of realizing economies of scale only if production facilities are sufficiently dimensioned (Kloock & Sabel, 1993). Furthermore, modularity in products and organizations are a necessary but not sufficient prerequisite for generating economies of substitution. Rather substitution effects occur only if components are actually reused in operations (Cusumano, 1991; Banker, Datar, & Kemerer, 1993). Thus, the corresponding core activity is stimulating modularity conform employee behaviour through applying core resources such as a focused incentive system and IT and communications infrastructure supporting search and coordination activities (Graham, 1994). Moreover, modular product designs allow 'decoupling of processes for developing new products, enabling to become concurrent, autonomous, and distributed and making possible the adoption of modular organization designs for product development' (Sanchez, 1996, p. 121; Sanchez, 2002). Analogously, modular product architectures result also in higher manufacturing agility through altering the degree of machine flexibility and mix flexibility (Watanabe & Ane, 2004). However, this requires developing modular product architectures concurrently with agile manufacturing capabilities (Watanabe & Ane, 2004). In addition, modular product architectures require complementary activities such as 'a system for continuous improvement of work processes through codification and standardization' (Worren, Moore, & Cardona, 2002, p. 1128; Cusumano & Nobeoka, 1998; Garud & Kumaraswamy, 1995).

Although the modularity concept originated in technology management, many authors emphasize that firms need for complementary organizational resources and capabilities to exploit the 'economics of substitution' available through modular product structures (e.g. Cusumano and Nobeoka, 1998; Garud and Kumaraswamy, 1995). These capabilities include a system for continuous improvement of work processes through codification and standardization. The core activity in outbound logistics is delayed differentiation, what is achieved by adding value delivering customer perceived components at late stages of the delivery process (Hau & Tang, 1997). As delayed differentiation components are frequently assembled in warehouses, decentralized assembly capabilities are required.

MS core activities are real-time market research and identifying core components determining customer perceived value. Real time market research depends on customer feedback generated on rapid and efficient prototyping based on modular designs. This feedback, in turn, is used to identify core components by analyzing the differential effects of product variants on customers' value perceptions. Accordingly 'threshold, central or plus-only' product attributes can be differentiated with special attention on core components (Bogner & Thomas, 1996). This requires specific analytical capabilities, which are often located in decentralized MS units generating customer data on product variants from field trials in for example antenna or test shops (Sanchez, 1996, p. 130).

SQHS core support activities are located in firm infrastructure (FI), HR management and technology. Core activities within FI are constructing organization structures modularly, orchestrating independent, self-managing units, and dynamically reconfiguring and transforming the value chain. Developing loosely coupled organizational subsystems or 'self managing teams' is an essential activity for dynamically adapting the value chain (Worren, Moore, & Cardona, 2002, p. 1126). This requires high degrees of standardization and formalization capabilities for defining interfaces as the basis for embedded coordination (Zander & Kogut, 1995; Zenger & Hesterly, 1997). Also the capabilities of identifying core components and units, partitioning the overall system and coordinating internal and external product and service provision are essential (Garud & Kumaraswamy, 1995; Worren, Moore, & Cardona, 2002, p. 1126). As coordination and partitioning are required repeatedly, knowledge sharing and codification are essential capabilities. Moreover, the decomposition of the value chain requires strong collaboration capabilities in order to coordinate individual units by means of standard input and output definitions (Jarvenpaa & Ives, 1991). Last, deconstructing the value chain in its individual parts and reconfiguring it by using external

resources can foster ‘resource leverage’ as external resources can be used while only carrying its costs partially (Sanchez, 1995, p. 151; Garud & Kumaraswamy, 1995, p. 102). Thereby, SQHS compensate own resource deficits, facilitate knowledge exchange, or align definitions of interfaces beyond company borders (Prahalad & Hamel, 1990). However for achieving this, firm’s need to have a distinct combinative capability allowing effective and efficient integration of internal and external resources (Zander & Kogut, 1995). Additionally, sequential strategic enhancement requires the management capability of identifying internal or external change requirements determining the degree of internal change necessary and adapting the value chain accordingly. Especially the last core capability requires the dynamic capability of reconfiguring and transforming a firm’s current set of activities and resources. In consequence the focus of strategic management shifts to a ‚higher-order’ process of redesigning the firm as a system for rapidly reconfiguring and redeploying a changing array of assets and capabilities (Sanchez, 1996, p. 126).

In HRM core activities of SQHS are reuse and transfer of knowledge, architectures and components as well as employee rotation and development. Next to operative learning through ‘real-time market research’, knowledge transfer is among the most important activities for developing or improving a firm’s reconfiguration and transformation capabilities and achieving economies of substitution (Garud & Kumaraswamy, 1995, p. 98). Knowledge in traditionally structured firms is typically not characterized by change and adaptation; rather it is stable in nature and coined by ‘knowledge hoarding’ (Garud & Kumaraswamy, 1995, p. 98; Henderson & Clark, 1990, S. 20). Contrary, SQHS are sharing, reusing and developing knowledge by means of employee rotation and development, knowledge documentation and incentives (Garud & Nayyar, 1994). This is mainly based on the capabilities of standardization and formalization and is congruent with findings that if ‘all teams and departments follow the same basic process architecture, the company achieved more rapid knowledge transfer and rotation of personnel across organizational boundaries’ (Worren, Moore, & Cardona, 2002, p. 1127; Garud & Kumaraswamy, 1995). In that line of argument, however, employee development is not a one-time event but rather a continuous effort leading to partially retraining employees for example (Hamel, 1994). Such a continuous effort can be described as a ‘meta-learning process’ consisting of information transfer, continuous improvement based on experimentation, and the development of firm specific skills based on dynamic routines through which core competencies are updated ((Lei, Hitt, & Bettis, 1996; Garud & Kumaraswamy, 1995, p. 99). This is further strengthened by another core activity offering incentives to employees for sharing and documenting knowledge. Therefore, management has to be capable of developing a clear understanding

of employees' intrinsic and extrinsic motivation and transferring that knowledge into the firm's incentive system (Cusumano, 1991). Another resource supporting knowledge sharing and reuse is a company's culture fostering collaboration and exchange (Worren, Moore, & Cardona, 2002, p. 1128). In addition, a SQHS culture advances employee orientation and thus emphasizes the importance of employees for other capabilities such as reconfiguration and learning (Worren, Moore, & Cardona, 2002, p. 1129; Garud & Kumaraswamy, 1995, p. 99). Also fundamental change willingness needs culturally to be embedded reflecting the continuous search for new solutions by using existing and new knowledge (Henderson & Clark, 1990, S. 6). Finally, SQHS core operational and management activities are reflected in a firm's culture encouraging strong customer, competitor, innovation and technology orientation.

Core activities in technology management are centred on information and communication technology (ICT) supporting learning, reuse and coordination. This is mainly driven by the increased information and communication requirements resulting from SQHS modular variety and its distinct capabilities of standardization, formalization and coordination. Therefore, "… information and telecommunications technologies are playing an important new role in linking widely dispersed product creation activities. Establishing effective electronic mediation of processes for developing, manufacturing, distributing, and marketing products requires establishing shared communications interfaces and standardizing descriptions of products, components, parts, and processes" (Sanchez, 1996, p. 132). Consequently, hybrid sequential firms have to be capable of evaluating ICT in terms of its firm specific applicability and benefits as well as implementing the technology. This is of particular interest in 'dynamic product markets where technologies and market preferences are changing rapidly, these new competences in managing flows of knowledge and information appear to have eclipsed more traditional management skills in managing flows of funds and goods as primary sources of competitive advantage' (Sanchez, 1996, p. 122).

In summary, SQHS core primary activities are located in RD and MS. For combining competitive advantages successfully, however, an adequate structure of support activities and corresponding resources and capabilities is required. Figure 6 provides an overview on SQHS core activities and capabilities.

FIGURE 6: OVERVIEW SQHS

	Underlying concept	Activity drivers	Activity system and activities (n=20)	Core capabilities (n=19) and resources (n=1)
Differentiation	1. Increase customer perceived product variety and adaptability through mixing and matching of components within existing architectures	- Variety - Flexibility - Speed	I.1. Firm infrastructure (n=8) - Partition overall value chain and coordinate internal and external component provision - Decompose and reconstruct internal processes and structures as well as external value chain - Apply flat hierarchies and self-managed, independent units - Collaborate in cross-functional teams - Decentralize sales and marketing units - Establish market driven, dynamic partner networks - Establish retailer network granting access to interconnected information I.2. HR management (n=4) - Incentive based reuse and transfer of knowledge, architecture and components - Continually retrain, rotate and develop employees - Empower employees in autonomous, distributed teams - Involve employees in reconfiguration and learning I.3. Technology (n=2) - Apply sophisticated manufacturing technology - Apply ICT for coordinating customer specific and customer neutral value chain activities I.4. Purchasing (n=1) - Select appropriate vendors for supply of customer neutral, standard components II.1. Research and development (n=10) - Design products modularly - Reuse product architectures, interfaces, components and structural units - Focus on architectures not products - Modularity decouples processes for developing new products allowing concurrent product development processes as well as basis for agile manufacturing - Focus on continual improvement in architecture and component design - Include manufacturing early in product development - Apply customer information in product development - Apply customer information for identifying core components - Create architectural platforms for allowing product variants - Prototype rapidly II.2. Inbound logistics (n=0) II.3. Operations (n=6) - Couple technology development on components and decouple on architecture level - Focus on modular and agile manufacturing structures - Continuous improvement of work processes through codification and standardization - Apply customer information in form of customer required combinations in manufacturing - Integrate across functions while maintaining excellence within each function - Invest long-term in advanced manufacturing technologies and information technologies II.4. Outbound logistics (n=2) - Assemble components decentred and late - Apply customer information for delayed assembly II.5. Marketing and sales (n=9) - Establish customer relationship through modularly upgrading and extending products - Gain fast feedback from customers through real time market research - Apply ICT for receiving fast customer feedback e.g from antenna shops - Manage knowledge and information flows with other firms and with product markets - Capture customer information on modular product configurations demanded - Continually measure, analyse, and exchange knowledge on customers - Research competitor and market information for identifying uncovered customer needs - Research focus on mass markets - Focus on customer perceived, core components impacting customer satisfaction II.6 Service - Service used for information collection	Operational resources (n=1) and capabilities (n=9) - Sufficient and long-term resources to invest in manufacturing hardware and information and communication technology (ICT) - Modular design capability - ICT evaluation and application capability - ICT capability to process increased information and communication requirements - Capability to operate an efficient and agile manufacturing system - Experimental product development capabilities - Organizational and individual learning by using, doing and experimenting - Component oriented customer value analytic capability - Research capability on customers, competitors and suppliers - Capability to standardize, automate and codify Management capabilities (n=13) - Capability of identifying change requirements and required strategy adaptation as well as firm specific adaption of generic concepts - Process and function decomposition capability - Business architectural (re-)configuration and transformation capability - Capability to transfer knowledge - Network oriented, structural management capability - Structural interface specification and alignment capability - Internal and external resource combination and assimilation capability - Partner evaluation, selection and integration management capability - Capability to adopt new technologies and adapt to technological changes - Capability to involve employees in decision making and encourage education and training - Capability to substitute overt management authority by embedded coordination - Provide incentives for documenting and sharing knowledge - Capability to build lasting, learning customer relationship based on modular flexibility Company culture (n=7) - Culture of full commitment to product and organization architecture and customer satisfaction - Culture fostering interactions through institutionalised organizational mechanisms - Collaboration and exchange fostering culture - Culture fostering customer and employee orientation and change - Long-term orientation - Culture emphasizing modularity conform behavior of reuse and sharing - Orientation towards mass markets
	2. Modular flexibility avoid partial or complete product obsolescence	- Investment requirements - Transaction cost		
Cost	3. Value chain efficiency through reusing components across product variants, families and generations	- Scale - Capacity utilization		
	4. Manufacturing efficiencies through leveraging existing architectures, interfaces and components across product variants, families and generations	- Substitution		
	5. Value chain efficiency through emphasizing architectural level and core components, critical to overall product performance and customer perception	- Substitution		
	6. Manufacturing agility through product modularity reducing lead time	- Substitution - Speed		
	7. Reduce managerial costs through external sourcing of standard components	- Substitution		
	8. Improve learning through reuse and transfer of knowledge across, divisions, functions and processes	- Learning		

C. THEORETICAL FOUNDATION AND GENERIC CONCEPT OF CONCURRENT HS

As already mentioned above, three CHS types exist: Variety, quality and innovation based CHS. While effects on differentiation as well as on cost effects differ between the three types of CHS, they share common characteristics. A first commonality is that all concepts can be distinguished in a customer perceived as well as a firm internal perspective (Huffman & Kahn, 1998). Customer perceived satisfaction is essential, which "is generally construed to be a postconsumption evaluation dependent on perceived quality or value, expectations, and confirmation/disconfirrnation - the degree (if any) of discrepancy between actual and expected quality" (Anderson E. W., 1994, p. 20). Thereby, both individual transactions as well as the general appraisal of a particular brand or a firm contribute to customer satisfaction (Oliver, 1980; Anderson & Fornell, 1993). A second commonality is that customer perception leads to differentiation based, indirect cost advantages through inducing higher product demand, increasing production and sales volumes and thus, elevating scale economies (Fleck, 1994; Proff & Proff, 1997).

Besides these shared common characteristics, each CHS concept generates type specific direct differentiation and cost effects. In the following, each CHS type is described starting with its generic concept, followed by its cost and differentiation drivers and concluding with its core activities, capabilities and resources.

C.1. Variety based CHS

C.1.1. A generic conceptualization of VCHS

Variety in strategic management represents in a narrow definition the number of variants within a specific product group or the amount of product lines a firm offers (Lancaster, 1990; Bohn, 1993). In this reasoning, variety is determined by the breadth and depth of a firm's portfolio. The wider definition covers the overall product mix within an industry and thus, variety is determined relative to a market's range of products and services (Bohn, 1993). Due to the object of analysis in this thesis – the business unit – as well as the objective of this thesis – uncovering HS underlying mechanisms – the narrow definition is applied in the following.

Accordingly, variety further disaggregates in external, customer perceived and internal variety (Child, Diederichs, Sanders, & Wisniowski, 1991). External variety refers to the number of variants perceived by

customers. ‘Variety for sales’, ‘functional’ or ‘customer perceived variety’ are often used synonymously (Huffman & Kahn, 1998; Jiao, Ma, & Tseng, 2003). As the different definitions indicate, it is a relative construct as it is evaluated by each customer based on the degree of customer satisfaction achieved through a firm’s transaction or its general brand or firm appraisal compared to its rivals. This results in mass customization’s claim to “produce enough variety in products and/or services so that nearly everyone finds exactly what he or she wants at a reasonable price” (Kotha, 1996, p. 440)

Internal variety, in contrast, determines the multitude and diverseness of a firm’s internal tasks and procedures. Consequently, synonyms used are ‘technical’ or ‘technological variety’ (Piller, 2003; Huffman & Kahn, 1998).

On aggregated level, generic cornerstones of VCHS are twofold: First, approximate products and services to heterogeneous customer preferences for improving differentiation, which in turn allows charging higher prices (Bohn, 1993). On the extreme scenario with no volume effects assumed, a firm can even maximize their profits by offering each customer an individual product or service. If, however, a firm needs to consider volume effects, the amount of different product variants and product lines has a direct impact on the overall organisation and the supply chain, as requirements on procurement, production, logistics, MS rise. This leads to increasing internal complexity and thus higher cost. Therefore, VCHS is required to find an optimal level of variety between differentiation and internal cost meaning that consumers still find its offerings attractive, while keeping the level of complexity and the company’s total cost low (Child, Diederichs, Sanders, & Wisniowski, 1991). More specifically, VCHS need to reduce costly internal, technical variety, while concurrently increasing customer perceived, functional variety. (Jiao, Ma, & Tseng, 2003, p. 812).

This leads to the second cornerstone of VCHS: The trade-off between differentiation and cost. While differentiation positively affects a firm’s profits, it typically raises cost. In order to be hybrid, however, VCHS needs to compensate the variety driven, higher complexity cost by other cost decreasing effects. Central for this ‘compensation’ mechanism underlying VCHS are economies of scope, which result from a firm’s scope rather than scale (Panzar & Willig, 1981). According to Panzar and Willig, economies of scope exist “where it is less costly to combine two or more product lines in one firm than to produce them separately” (Panzar & Willig, 1981, p. 268). The theory of economies of scope is based on production and

transaction cost. While production cost advantages explain integrated production lines, transaction cost explain why organizing production in one multi-product firm (versus market transactions).

Production based economies of scope result mainly from providing sharable input to multiple product lines thereby reducing cost. This cost decrease is based on *cost subadditivity* meaning that the total cost are decreasing when providing a service to several product lines compared to providing it to each product line separately (Panzar & Willig, 1981). This is in line with research findings suggesting no strong negative effects of broadening product line on operations. "In fact, in the industrial markets, (…) as product line broadens with respect to competition, relative direct cost fall by 0.50 while manufacturing costs decline by 1.1%. (…) In consumer markets too, product line breadth does not have any direct impact on both relative direct costs and total inventory, while manufacturing costs decline with broadening product line by 0.78 points" (Kekre & Srinivasan, 1990, S. 1223). Production based economies of scope result from shared input in the production process which is either imperfectly divisible leaving excess capacity in some production stages available for other product lines or it posses a quasi-public character and is freely available to other production processes once it is purchased for use in one production process (Willig, 1979, p. 346). Accordingly, Spady and Friedlander empirically conclude, "there are not economies of scale in the conventional sense, but rather economies of density and utilization" (Spady & Friedlander, 1978, p. 171). Correspondingly, the foundation of production based economies of scope is imperfectly divisible physical capital, human capital or external factors (Teece D. J., 1982). While the first two are subject to a firm's strategic considerations, the last is rarely susceptible by the individual firm, and thus, is not further elaborated in this thesis. However, while production cost oriented economies of scope are necessary, they are not sufficient for establishing vital VCHS. Rather, transaction cost economies of scope need to be considered. Why? Assuming no transaction costs exist, production based economies of scope could be sold via market transactions without requiring to broadening the scope of the firm. With rising transaction cost, however, the likelihood of market based transactions decrease as more specific physical and human capital is required. For further details on asset specificity as drivers of transaction costs see Williamson (1991). Thus, only if production *and* transaction cost economies of scope work in concert VCHS become vital. Moreover, transaction based economies of scope result from jointly utilized institutions, which consist of formal rules, informal constraints, and their enforcement characteristics (North, 1991). Transaction costs occur if institutions or organizations are created, changed, or utilized (Furubotn & Richter, 1991, S. 8). Institutions aim at reducing transaction cost by acting as 'quasi-public'

goods through utilizing without additional cost for example existing supplier relationships, sales channels or existing organisational structures. Thus, cost subadditivity can also exist purely for transaction cost. For that reason, Sharkey concludes that economies of scope exist on two different levels, first on product line level generating 'plant subadditivity' and second, on firm level creating 'firm subadditivity' (Sharkey, 1982, p. 58).

Nonetheless, also negative cost effects arise from increased internal variety driving firm complexity and transaction cost (Huffman & Kahn, 1998). Particularly, areas in management and administration can suffer from complexity driven transaction cost increases (Fleck, 1994, p. 114). Furthermore, increasing product variety can lower the degree of specialization and standardisation raising production cost in areas like set-up costs, costs of higher qualified labour and specialized equipment, as well as complexity costs on all levels of planning and execution (Piller & Müller, 2004).

Thus, vital VCHS concepts need to compensate for variety driven higher transaction cost through production and transaction based economies of scope. A concept describing principles to counterbalance the additional costs of high variety of customised production is mass customization (Piller & Müller, 2004). Already one of the first definitions on mass customization describes the concept's hybrid potential: "the same large number of customers can be reached as in mass markets of the industrial economy, and simultaneously treated individually as in the customized markets of pre-industrial economies" (Davis, 1987, p. 169). Thus, mass customization is combining variety and individual customization with prices comparable to standard goods and services (Pine, 1993). Further refining Davis' definition, Tseng and Jiao extended that view by specifying that mass customizers are able to deliver customer individualized goods and services meeting with near mass production efficiency (Tseng & Jiao, 2001). This emphasize on near mass production efficiency allows distinguishing mass customization from craft customization as 'only if the premiums asked for the customized solution do not lead to a change of market segments compared to providing the product in a mass-production system we will refer to as mass customization' (Piller, Moeslein, & Stotko, 2004, p. 438). In the following, the definition of Piller is applied: "Mass customization refers to a customer co-design process of products and services, which meet the needs of each individual customer with regard to certain product features. All operations are performed within a fixed solution space, characterized by stable but still flexible and responsive processes. As a result, the costs associated with customization allow for a price level that does not imply a switch in an upper market segment"

(Piller, 2005, S. 315). For more detailed descriptions on the different archetypes of mass customization see Piller (2004).

Typically, external variety drives internal variety, which in turn increases a firm's internal complexity and cost. As Hagel states, however, complexity is not necessarily undesirable, rather it is a often necessary component in building, or maintaining competitive advantage and thus, complexity becomes a matter of business judgement, weighting its cost against its value for customers (Hagel, 1988). Consequently, the theoretical degree of optimal variety is the point marginal complexity cost equal marginal complexity revenues (Fleck, 1994). Thus, the positive net result of mass customization's cost decreasing effects, its increasing complexity cost and its complexity revenues, are the basis of vital VCHS (Hildebrand, 1997). Or put differently, minimizing internal complexity and its related cost as well as extensively exploiting cost reduction potential is crucial for the success of VCHS (Piller, 2000).

C.1.2. Linking VCHS competitive advantages, activity drivers, activities, capabilities and resources

The following description of activity drivers of VCHS differentiates according to Porter's value chain framework primary and support activities (Porter, 1985). VCHS key primary activities consist of RD, inbound logistics, operations, outbound logistics, MS and services and secondary activities of FI, HRM, procurement and technology management.

Mass customization requires unique operational characteristics, which are explicated in the following. Therefore, first, differentiation and cost drivers of VCHS are discussed, before second, the underlying activities, capabilities and resources are described. Figure 7 provides an overview on VCHS generic concept, activity drivers, activities, capabilities and resources.

C.1.2.1. Competitive advantages and activity drivers of VCHS

Differentiation drivers and advantages

Major differentiation drivers are individualization and customer involvement. Individualization allows positioning products to specific customer preferences through certain product characteristics (Dickson & Ginter, 1987). Customers value individualization if their preferences differ sharply for certain product attributes such as the physical dimensions of a product (Zipkin, 2001). Varying products to individual

customer needs is also often termed ‘customization’ pointing to the differences among and uniqueness of products for customers (Jiao & Tseng, 2000). However, variety in mass customization is limited compared to traditional craft customization and is focused either on aesthetic design or on measurement level (Lampel & Mintzberg, 1996; Piller, Moeslein, & Stotko, 2004). While aesthetic design depends on style and thus on taste, measurement depends on fit, comfort and functionality (Zipkin, 2001; Piller, Moeslein, & Stotko, 2004).

Consequently, mass customizers need to be able to comply with customers’ willingness and ability to specify a product’s function, design and characteristics (Comstock, Johansen, & Winroth, 2004). By this, mass customizers fill the ‘sacrifice gap’ of mass producers incapable of aligning their products to individual wishes (Gilmore & Pine, 1997). Thus, product customization is justifying higher sales prices through lowering customer’s price elasticity resulting from better meeting customer specifics (Comstock, Johansen, & Winroth, 2004; Berman, 2002).

In this line of reasoning, *customer involvement* or customer integration is a driver of differentiation requiring interactions between the customer and the supplier (Piller, Moeslein, & Stotko, 2004). This interaction provides the supplier with personal information on the customer, which customers expect to be used in future interactions such as pre-filling a customer’s preferences or pre-selecting choices of product functionalities in configuration tools (Piller & Müller, 2004). This reduces a customer’s search and communication cost (Zipkin, 2001). Furthermore, some customers want to be involved in product development and configuration as they appreciate the result of co-production higher than standard products (Piller & Müller, 2004). Moreover, customers benefit from lower transaction cost by avoiding post-purchase efforts for adapting products to their specific needs.

Strong customer integration results in establishing *customer loyalty*, which allows better focusing marketing activities and eliminating advertising inefficiencies (Piller & Müller, 2004). Successful past interactions put technological, contractual and psychological burdens on a customer and thus, increases switching cost (Jackson, 1985). Switching cost can either be increased through direct switching cost, opportunity cost, or sunk cost (Riemer & Totz, 2003). Direct switching cost are all cost resulting from searching new suppliers as well as initiating, negotiating, and settling the new relationship (Riemer & Totz, 2003). These costs for customers are increased through mass customization’s ability to reduce comparability among products and to establish familiarity (Riemer & Totz, 2003; Peppers & Rogers, 1997).

Contrary, opportunity cost is the net result of unrealized benefits of an alternative supplier and the potential loss of the net-benefit of the current relationship in case of change (Riemer & Totz, 2003). Mass customization increases these costs by raising the likelihood of losing the net-benefits. Sunk costs incur for a customer through investments in the customer-supplier relationship, such as user profiles created or relationship based knowledge of a firm's proprietary configuration system (Piller & Müller, 2004). Consequently, the higher the sunk cost the less likely a customer is willing to migrate to a new supplier.

COST DRIVERS AND ADVANTAGES

Mass production and mass customization differ in their impact on economies of scale, scope and integration (Zipkin, 2001). Particularly, the overall activity system including RD, inbound logistics, production, outbound logistics, MS and service are different. In production, for example, the way to develop products and processes is different (DaSilveira, Borenstein, & Fogliatto, 2001). While in mass production products are developed first and then a coupled process is established, mass customization starts with creating the process and decouples the products (Taylor & Lyon, 1995). Thus, standard products, high fixed costs, inflexible production facilities, low variable costs, and stored product inventory characterize mass production. While even mass production systems offer degrees of flexibility, the main goal is to achieve high levels of production economies of scale, at the expense of higher levels of finished goods stored in inventory after production (Zipkin, 2001). Contrary, mass customizers operate production systems with substantially higher degrees of flexibility for tailoring products or services based on specific customer requirements. In turn, less or even no inventory is required reducing inventory costs at the expense of time delays in customer delivery (Zipkin, 2001).

As the total cost of VCHS need to correspond roughly to those of standard mass produced goods it is crucial to evaluate the cost increasing and cost decreasing effects of mass customization. This restricts possible options or adjustments to only those product features offered where users value customisation (Piller & Müller, 2004).

Central for *reducing cost* through mass customization is a concept termed economies of integration. They result from direct interaction between a supplier and its customers and represent efficiencies gained from deeper customer knowledge allowing establishing value processes that eliminate waste on all levels (Piller, Moeslein, & Stotko, 2004, p. 439). They contrast to economies of scale by not focusing on in-

creasing volumes of standardized products or services for driving down cost. Rather, sources of economies of integration are (1) customer integration, (2) better utilization of customer information, and (3) decoupling the value chain (Piller, Moeslein, & Stotko, 2004; Piller & Müller, 2004).

In general, a firm cannot be customer focused without being information intensive (Blattberg & Glazer, 2000). Thus, c*ustomer integration* is the initial starting point for a mass customization strategy. Integrating, in this sense, means involving the customer in firm activities, such as product specification and manufacturing (Reichwald, Piller, & Moeslein, 2000). The customer becomes a 'co-producer' or 'prosumer', or is seen - from a different angle – as a production factor, otherwise the firm has to provide itself (Wikström, 1996; Toffler, 1970; Ramirez, 1999).

The main result of this co-production is 'sticky information' (Piller & Müller, 2004). Information is sticky, if it is costly to acquire, transfer, and use (Von Hippel, 1994). Hence, mass customizers produce 'sticky information' through customers intensely interacting with them. Thereby, economies of integration are representing cost savings of getting easier access to and better utilization of *customer information* (Piller & Müller, 2004). Generating explicit knowledge from customers directly interacting with suppliers allows reducing marketing and development cost. Furthermore, consolidating this customer information generates valuable market and customer insights for future demand planning and thus, can reduce set-up and change over cost in operations. Moreover, utilizing customer information for market research, advertising, product development, product portfolio revisions, future sale of the same or similar products, or limiting choices in customized products reduces a firm's transaction cost (Vandermerwe, 2000; Berman, 2002). In that sense, economies of integration are economies of scope based on a 'quasi-public' good namely customer information (Peters & Saidin, 2000). This kind of iterative information generation and usage creates a reinforcing effect as improving the information basis leads to higher satisfaction among existing customers or allows acquiring new ones, which in turn leads to additional, valuable information. In that line of argument, strong customer integration results for example in establishing *customer loyalty*, which provides better focus of marketing actions and eliminating advertising inefficiencies leading to further extending loyalty (Piller & Müller, 2004)

Thus, mass customization has the potential to raise sales volume; or more general, gain comprehensive customer information and knowledge and establish customer relationships as cornerstones for entering a virtuous cycle leading to lower future acquisition, development, marketing, sales and service cost and

simultaneously increase the customer base (Pine, Pepper, & Rogers, 1995; Vandermerwe, 2000). In this sense, a '*learning relationship'* is established generating value for both, the customers and the mass customizers (Piller, 2003; Wehrli & Krick, 1998). Consequently, applying this information is a sine qua non-condition of vital VCHS or as Berman states, 'improved fit with each customer's unique needs, (…) the ability to raise the price of the final good or service due to the degree of customization, and the ability to analyze opportunities due to a continual dialogue with customers' (Berman, 2002, p. 53).

Decoupling the value chain means to separate order specific from customer neutral parts. This is possible through postponing activities until a customer enters his order (Gilmore & Pine, 1997). Consequently, the 'decoupling' decision is of key importance as setting the 'customer order decoupling point' (CODP) determines the degree of customer specific individualization a firm's value chain can generate (Giesberts & Tang, 1992). Or put differently, the CODP separates certain decisions based on concrete customer orders from decisions based on speculative demand expectations (Jäger, 2004). The speculative character is based on the insecurity of demand predictions used for product planning. This characteristic is also represented by alternative terms used for CODP such as coordination or freeze point, order-penetration-point or postponement strategy (Jäger, 2004; Rommel, 1991; Sharman, 1984; Van Hoek, Vos, & Commandeur, 1999).

The general principle is that the earlier the CODP is placed in the value chain the higher the productivity and the lower flexibility and vice versa. „The further downstream in the value-adding material flow that the CODP is located, the higher the degree of emphasis on productivity in operations, therefore price (cost) is normally the major competitive priority. On the contrary, by positioning the CODP further upstream a company can achieve a higher degree of flexibility and the customers can gain a hearing for their specific requirements" (Rudberg & Wikner, 2004, S. 446). Correspondingly, CODP can be differentiated in for example engineer-to-order, make-to-order, assemble-to-order und make-to-stock (Rudberg & Wikner, 2004). A similar differentiation separates pure customization, tailored customization, customized standardization, segmented standardization und pure standardization (Lampel & Mintzberg, 1996). Independent of the taxonomy, determining an appropriate CODP is a strategic decision, which needs to consider the degree of flexibility representing external variety and the degree of productivity representing internal variety. In essence, "the equilibrium between these two forces reflects the strategic choice by a company, taking customers' specific requirements (flexibility) and the technological preconditions (both product and process) into account" (Rudberg & Wikner, 2004, S. 446).

Through product and process technologies, mass customization is relocating this equilibrium further upstream allowing achieving higher degrees of flexibility and productivity. One critical point is to gain knowledge on customer required variety. The resulting positive cost effects result from improved product and process technologies applied in mass customization (Piller, Moeslein, & Stotko, 2004). Basic premise of mass customization are simplified and modular product and process architectures. In mass customization, "a product platform provides the technical basis for accommodating customization, managing variety and leveraging existing capabilities. Essentially, the product platform captures and utilizes reusability underlying product families and serves as a reservoir of knowledge bases for different products. It also elevates variant product proliferation for the same set of customer requirements" (Jiao, Ma, & Tseng, 2003, p. 812). This shows the similarity of concepts of economies of integration and economies of substitution. While, however, modular principles are the main basis for SQHS, modularity is only side aspect for VCHS. VCHS core principle is rather different and centres on managing information intensity (Piller & Moeslein, 2002). Based on such information, complexity can be reduced by excluding certain, unprofitable customer segments, reducing half-finished goods and variety of raw material, as well as increasing capacity usage of standard flexible manufacturing facilities. Consequently, it is essential in mass customization to maximize repetition for achieving efficiencies in production, sales, marketing, and logistics near that of standard mass producers (Jiao, Ma, & Tseng, 2003, p. 812). Commonality in design allows achieving this through reusing tools, equipment, and expertise in manufacturing (Jiao, Ma, & Tseng, 2003, p. 812). Additionally, a mass customizer's manufacturing system is characterized by '*dynamic product* change' but '*stable process* change' (Boynton, Victor, & Pine, 1993, p. 47). This means, mass customizers are required to adapt their products and product variants to timely fulfil dynamically changing customer demands. However, these external changes typically crystallise in stable, recognizable patterns of internal manufacturing requirements over time. Thus, mass customizers can institute stable, flexible platforms of process capabilities for meeting frequently changing external demands and thus, increase organizational knowledge and improving process efficiency incrementally (Boynton, Victor, & Pine, 1993).

According to Piller, *decoupling* has positive cost effects especially on inventory, planning, capacitiy utilization and stability as well as sales, which are briefly explained in the following (Piller, Moeslein, & Stotko, 2004). First, decoupling allows reducing or even eliminating stock in distribution channels as well as safety stocks in manufacturing. Second, in planning, complexity is reduced, costs for planning adaptation is lowered or even diminished, and fashion risks and 'product flops' are avoided. Additionally, capac-

ity utilization and stability is improved by avoiding bullwhip-effects, providing more stable processes, or having less over-capacity to adapt to short-term changes of trends. Finally, decoupling offers cost reduction potential in sales through avoiding lost sales in retail due to out-of-stock situations, preventing season end discounts, or offering opportunities for better channel management. These cost can be substantial as shown by an empirical analysis of the US apparel industry in 2001 predicting that nearly US$300 billion could be avoided caused by flawed forecasting, excessive inventory, misleading fashion estimations and unwarranted discounting (Sanders, 2001).

Next to the above described economies of integration, mass customization provides economies of scope on plant as well as on firm level (Sharkey, 1982). Potential for *scope economies from mass customization on plant level* result from imperfectly divisible physical capital, human capital or external factors applied in RD, design, operations, outbound logistics, MS and services (Panzar & Willig, 1981; Teece D. J., 1982). In design, shared input across multiple product lines are for example commonly used tools for product configuration or systems for customer-firm-interaction in co-design activities (Piller, 2005). In operations, *cost subadditivity* is generated through divisible facilities such as flexible production facilities or coordination systems. Especially, state-of-the-art production and information technologies are providing the necessary flexibility to produce high volumes of customer individual products, while simultaneously generating economies of scale and economies of scope (Jäger, 2004). This is due to the fact that modern production and information technologies possess the potential to reduce switching cost and in turn, lower the minimum efficient size of production lots (Jäger, 2004). Additionally, modern production technologies shorten set-up times, thereby providing the basis for producing higher volumes of different product variants on same production capacities and processes (Jäger, 2004). Furthermore, transaction costs are decreased by employing incompletely divisible and not fully utilized human resources in RD, purchasing, production, and MS.

On *firm level, transaction cost* are reduced through institutions acting as ‘quasi-public’ goods, which can be utilized at no additional cost (Furubotn & Richter, 1991, S. 8). In this line of argument, information technology is seen as ‘a comprehensive, seamless, common platform that can be shared or adopted by the firm’s channel partner’ (Berman, 2002, p. 58).

Thus, cost subadditivity exists also on firm level. In this sense, commonly sharing institutions such as existing supply and sales channels as well as organisational structures such as firm internal sales organisations or service centres reduces transaction cost on firm level.

Finally yet importantly, *cost of capital* is reduced as safety and distribution inventories are lowered or eliminated.

Despite the above-mentioned positive impacts on cost drivers, mass customization produces also *negative cost effects*, compared to traditional mass producers. The increasing effects mainly result from increasing internal variety and its impact on production, transaction, 'failure' and capital cost.

Production cost increases are driven largely by the increasing number of variants reducing the degree of specialization and standardization of a firm's products and services compared to traditional mass producers (Fleck, 1994). Lower specialization and standardization, in turn, results typically in smaller lots in production, logistics, and distribution lessening economies of scale and elevating set-up cost (Piller & Müller, 2004). Furthermore, the higher the degree of internal variety, the higher the cost for employees as skill requirements rise (Piller, Moeslein, & Stotko, 2004). Several manufacturing techniques allow mass customizers to provide the required flexibility such as 'modular design, platform commonality, postponement, and configuration and/or logistics techniques' (Cavusoglu, Cavusoglu, & Raghunathan, 2007, S. 13).

One of the main reasons for *higher transaction cost* is caused by mass customizers' information intensity and coordination requirements. The underlying driver is the number of different customers, which in turn is increasing efforts in marketing, pre- and after-sales services. In consequence, higher transaction costs are required for instance for building up customer relationship, closely interacting with customers and providing extensive after-sales support. The literature highlights especially elicitation cost, which is the 'cost of interacting with the customers to obtain specific information about their preference structure' (Cavusoglu, Cavusoglu, & Raghunathan, 2007; Zipkin, 2001). In each case, growing interactions with individual customers and affiliated information processing requirements increase transaction cost (DaSilveira, Borenstein, & Fogliatto, 2001). This demands an informational as well as an analytical basis enabling for example the integration of customer orders and production systems or databases as well as the analyses and reports on customer data for marketing purposes (Piller & Müller, 2004; Reichwald, Piller, & Moeslein, 2000). Another reason increasing transaction cost is management complexity, as for example in strategic management due to broadening a firm's product and service portfolio or in operational management due to additional requirements in production planning and control as well as in quality management (Piller, Moeslein, & Stotko, 2004; Zipkin, 2001).

Additionally, incorrectly implementing mass customization can lead to additional costs. Such *costs from 'failure-to-implement'* typically result, ordered by their importance, from higher material cost, increased production cost, lower delivery reliability, inferior supplier performance, extended order transaction times, and reduced product quality (Ahlström & Westbrook, 1999). However, risk is fundamentally intertwined with probability and thus higher likelihood for 'failure to implement' results from for example inferior supplier performance, extended order time, reduced product quality and lower delivery reliability.

Finally, internal variety requires substantially higher investments (Gupta & Goyal, 1989). Thus, investments in flexible production systems and sophisticated IT systems of mass customizers are higher than the investments needs of mass producers (Fleck, 1994). In essence, this generates higher *cost of capital.*

C.1.2.2. DETERMINING VCHS CORE ACTIVITIES, CAPABILITIES AND RESOURCES

Activities, capabilities and resources are bonded as activities engage capabilities and resources for achieving a firm's objectives. Many activities, capabilities and resources are similar in mass production and mass customization, while others differing are discussed in the following.

Understanding the individual needs of a customer as the initial starting point of mass customization requires the ability to perceive and capture latent market niches (Jiao, Ma, & Tseng, 2003, p. 812). Consequently, mass customizers are strong in sensing, analysing and responding to customer needs. This requires long-term investments in ICT (Kotha, 1995). A continuous and intense customer-firm interaction enhances a firm's market research capability enabling mass customizers to study the configurations required by customers. "This information can be used in developing new mass products, revising mature ones, or limiting choice in a customized product. Unlike other sources of market research, data on customer preferences based on mass customization are current, do not require respondent cooperation, and are based on actual sales - not measures of a buyer's preferences or willingness to buy" (Berman, 2002, p. 54). This capability, which can be transferred in organisational or explicit knowledge, is extended by successive customer transactions (Kotha, 1996). However, next to primary data generated through direct customer interaction, secondary sources such as retailers can be used to collect customer information. This can be supported by a firm's infrastructure activities establishing a network of participating firms granting access to interconnected information (Kotha, 1995). In that sense, mass customization encom-

passes the overall value chain across suppliers, distributors, and retailers requiring all firms to attend to the system's demands (DaSilveira, Borenstein, & Fogliatto, 2001). Aggregating all this primary and secondary information generates "better market research and more accurate forecasting concerning customer needs" (Piller, Moeslein, & Stotko, 2004, p. 441).

For efficiently converting customer preferences in individualized products, a high degree of standardization is required. Seemingly contradictory, combining product customization and manufacturing standardization is not just possible but even mandatory. Hereby, standardization allows highly utilizing common parts of product and process components as well as tools. This requires to „maximizing commonality in design, which leads to reusable tools, equipment, and expertise in manufacturing" (Jiao, Ma, & Tseng, 2003, p. 811). Thus, creating a system of (re-)combinable elements applied across changing products and markets is key for VCHS (Boynton, Victor, & Pine, 1993). In turn, this requires modular concepts in product and process design (Selladurai, 2004). Accordingly, three corner stones of designing mass customization's value chain exist (Salvador, Rungtusanatham, & Forza, 2004). First, loose connections among supply chain constituents provide enough flexibility for enabling the firm to serve varied and frequently changing customer needs. Second and opposite to first, tight connections among supply-chain actors for allowing prompt, synchronous reaction to differentiated customer needs. Lastly, postponing customization activities to later stages of a firm's supply chain leaves the earlier stages unaffected by mass customization and thus, allows for higher standardization of these stages. In accordance with that, Fine (1998) concludes that modular supply chains would be best suited to make and deliver modular products. Consequently, VCHS are requiring distinct capabilities in product development as well as in process and process technology development. Furthermore, the stable, but flexible manufacturing platform provides the basis for continually improving process capabilities and know-how and in turn, increase an organization's base of knowledge, while continuing to increase process efficiencies (Boynton, Victor, & Pine, 1993, p. 47). Also in this line of reasoning, firm infrastructure is characterized by loose relationships in stages of the value chain responsible for customer neutral activities; while tight relationships are required for value chain stages providing customer specific activities. This explains for example supplier networks located in close proximity to mass customizers as neutral, non-customer specific components can be externally purchased with no need to tightly integrate (Kotha, 1995).

Most attention in the academic discussion on mass customization's value chain centers on flexible manufacturing capabilities and technologies (Jäger, 2004; DaSilveira, Borenstein, & Fogliatto, 2001). This is appropriate, as missing building up flexible manufacturing can cause severe negative consequences when applying VCHS (Westbrook & Williamson, 1993). In this line, Kotha argues that success with mass customization is depending on "access to substantial in-house engineering expertise and manufacturing capabilities as well as making long-term investments in advanced manufacturing technologies" (Kotha, 1995, p. 39). Otherwise, implementing mass customization without a high degree of manufacturing competence can easily end up in 'a manufacturing and logistics nightmare' (Kotha, 1996, p. 448). Furthermore, "mass customizers need to automate as many tasks as possible to make use of the benefits of automation and standardization. Also, the links between modules must be automated and the activities of integrating people and tools to perform them must be integrated instantly" (Selladurai, 2004, p. 5). Additionally, a strong focus on production quality is indispensible as a mass customization's 'production system rewards attention to details and stresses the importance of ‚zero mistakes' in all activities of the value creation process' (Kotha, 1995, p. 39). Consequently, firms applying VCHS operate a highly integrated and qualitative manufacturing requiring organizational mechanisms fostering interactions among process and organizational modules (Kotha, 1995, p. 39).

However, as customers specifying their individual wishes generate additional information and coordination needs for a firm, it is critical in mass customization to supplement flexible and highly qualitative production systems with information technologies. Thus, advancing technologies on process flexibility and information and communication are fundamental for handling the high amount of information and thus reducing transaction costs related to information processing (Dietrich, Timm, & Kirn, 2003). Correspondingly, some researchers argue that 'the very concept of mass customization appeared only after some companies were able to successfully integrate a series of information and process flexibility technologies" (DaSilveira, Borenstein, & Fogliatto, 2001). Hence, mass customization is somehow the application of computer integrated manufacturing combined with for example web or retail store based electronic order-acquisition systems, order-processing software for coordinating raw material flows or finished goods shipment as well as customer data-bases (Anderson D. M., 2003; MacCarthy, Brabazon, & Bramham, 2003; Berman, 2002).

These technologies contrast sharply to mass producers trying to reduce specific information to a minimum in order to be cost efficient. Rather, mass customizers apply information intensively in products and

processes for driving down cost of individualized products. (Lee, Barua, & Whinston, 2000). In that sense, information technologies are a prerequisite to reduce complexity, set-up, switching, and transaction costs for mass customizers (Piller & Müller, 2004, S. 584). Consequently, mass customizers need to be capable of developing and operating modern ICT, especially in areas such as configuration, manufacturing planning, order tracking, and relationship management (Lee, Barua, & Whinston, 2000). Moreover, the information system must be able to analyze and integrate the entire supply chain from configuration to direct shipment of customized products (Berman, 2002).

Nevertheless, while processing customer information for manufacturing is important, design and configuration tools also fulfil another important task: collecting data for exploring customer demand sets (Von Hippel, 1994). However, faced with the immense potential of products and product variants offered through mass customization, it is often forgotten that customers can be overburdened by the sheer amount of product(s) variety. Thus, too much choice can generate difficulties in the elicitation as well as in the production process (Berman, 2002). This can be avoided, however, through offering 'easy-to-choose' options or other configuration support during the elicitation process (Berman, 2002, p. 55). Consequently, VHCS requires a high degree of competence in pre-selecting or pre-configuring product (variants) or put differently, they possess a high capability in product (variant) management. Thereby, the integration of production and marketing for the purpose of for example aligning production planning is of significant importance (Kotha, 1996, p. 448; Selladurai, 2004, p. 5). This is leading to a stronger integration of RD, marketing and production in VCHS compared to mass producing firms. However, a prerequisite of product variety, independent of its absolute amount, is that firms convince customers of the benefit of individualization. This led for example mass customizers in the Japanese bicycle industry to intentionally delay the delivery of customized bicycles in order to increase customers' perception to wait for something 'especially valuable' (Kotha, 1996). This example shows a mass customization's requirement to establish a 'a savvy marketing group that can excite customers about individual product offerings' (Kotha, 1996, p. 448). Additionally, mass customizers need to be able to target the fulfilment process to each particular customer (Jiao, Ma, & Tseng, 2003, p. 812).

Moreover, due to co-designing a product, customer's uncertainty and thus, transaction cost may rise. For that reason, mass customizers need to apply instruments, such as for example warranties, customer care centres or brand reputation for establishing trust of prospective customers (Piller, Moeslein, & Stotko, 2004, p. 448).

Finally, VCHS rely heavily on human resource development as neither information technology nor computer-integrated manufacturing is sufficient for achieving flexibility and responsiveness critical to mass customization; rather, employees create the knowledge required for 'refining existing skills and developing manufacturing capabilities essential for the pursuit of their approach to customization' (Kotha, 1996, p. 448).

VCHS *firm culture* is characterized by four orientations: customer, technology, employee and cost. As the overall concept of mass customization is based on the customer, it also represents the main organizational focus. In particular, customer knowledge is requiring the firm's culture to focus on knowledge creation and distribution across the whole value chain (DaSilveira, Borenstein, & Fogliatto, 2001). Additionally, VCHS are distinctively apt to applying technology in order to automate and standardize (Selladurai, 2004). Consequently, the culture of firm's following VCHS is characterized by high affinity to new technologies as well as by high adaptiveness to technological changes (Kotha, 1995). Above that, VCHS culture is focused on cost represented by an orientation towards mass market, which strategically requires managing all additional cost of customization (Davis, 1987, p. 169; Piller, Moeslein, & Stotko, 2004). Another important cultural orientation is management's attention to human resource development in order to develop new knowledge for refining existing skills and developing manufacturing capabilities. As this knowledge is integrative in nature, it requires a cross-functional collaboration between mostly autonomous units along the entire value chain (Pine B. J., 1993). Figure 7 presents an overview on VCHS underlying activities, capabilities and resources.

FIGURE 7: OVERVIEW VCHS

	Underlying concept	Activity drivers	Activity system and activities	Core resources and capabilities
Differentiation	1. Meet demands of individual customers through customer co-design with regard to aesthetic design and/or measurement level 2. Lower transaction cost of customers through avoiding post-purchase adaptations	- Individualization - Customer involvement - Transaction cost	I.1. Firm infrastructure (n=5) - Separate the value chain according to customer specific and customer neutral activities - Couple customer neutral, standard activities loosely and couple activities contributing to customer value tightly - Cross-functional team collaboration - Automate links between modules - Establish network of suppliers, distributors, and retailers wiling and ready to attend to the system's demands I.2. HR management (n=4) - Share and reuse market and customer insights - Develop employees especially in advanced and new technologies - Educate and motivate workers - Involve employees in refining existing skills and developing manufacturing capabilities I.3. Technology (n=2) - Apply computer technology in manufacturing - Apply ICT for analyzing and integrating entire supply chain I.4. Purchasing (n=1) - Integrate external supply and distribution partners II.1. Research and Design (n=9) - Design products modularly - Reuse product architectures, interfaces, components and structural units - Focus on creating processes decoupled from products - Concurrent in-house engineering and manufacturing capabilities for aligning RD and manufacturing - Focus on continual improvement in architecture and component design - Include manufacturing early in product development - Apply customer information in product development - Apply customer information for customer specific product configuration - Create architectural platforms for allowing product variants II.2. Inbound logistics (n=0) II.3. Operations (n=8) - Design processes modularly - Focus on automation and standardization in manufacturing - Continually improve process capabilities and know-how in manufacturing - Apply customer information in process development and customer specific manufacturing - Integrate activities of people and support tools - Integrate marketing, sales and production for production planning - Assemble customer specific components late in production - Invest long-term in advanced manufacturing and ICT II.4. Outbound logistics (n=2) - Assemble customer specific components late in logistics process - Adapt fulfillment process to each particular customer II.5. Marketing and sales (n=12) - Collect and enhance customer information through continuous, direct customer interaction in product specification - Determine customer required variety real time according to product configurations specified - Apply ICT for supporting customer in elicitation and after-sales - Aggregate information from suppliers, distributors and retailers - Capture information on customer specific product configurations ordered - Continually measure, analyse, and exchange knowledge on customers - Research competitor and market information for identifying uncovered customer needs - Excite customers for individualization - Research focus on latent market niches in mass markets - Focus on customer perceived, core components impacting customer satisfaction - Focus and integrate R&D and marketing - Establish trust in elicitation process II.6 Service (n=2) - Service used for information collection - Establish customer trust by supporting tools in e.g. elicitation process	Operational resources (n=1) and capabilities (n=9) - Sufficient and long-term resources to invest in manufacturing and information and communication technology (ICT) - Modular design capability - Capability to implement and operate ICT in configuration, manufacturing, planning, order tracking and relationship - Capability to process high amount of information - Capability to operate a stable, but flexible, highly standardized and automated manufacturing system - Experimental product development capabilities - Organizational and individual learning based on customer relationship - Capability to identify customer perceived value adding activities - Capability to sense customer preferences and transfer customer preferences in configurable products - Capability to manage multitude of product variants Management capabilities (n=10) - Management of value chain stages based on customer neutral or specific activities - Capability to balance external and internal variety through instituting stable, but flexible platforms of process capabilities - Capability to explicate, aggregate and administer customer knowledge - Network management capability across overall value chain - Capability to identify and capture latent market niches - Capability to adopt new technologies and adapt to technological changes - Capability to involve employees in refining existing skills and developing manufacturing capabilities - Forecasting capability - Provide target values for products and processes - Capability to build lasting, learning customer relationship based on individual customer needs Company culture (n=7) - Culture of full commitment to flexibility and customer satisfaction - Culture fostering interactions through institutionalized organizational mechanisms - Culture fostering knowledge creation and distribution across the overall value chain - Culture fostering customer and employee orientation and change - Long-term orientation - Culture emphasizing external information and analytics - Orientation towards mass markets
Cost	3. Value chain efficiency through decoupling customer specific and neutral activities allowing to postponing activities until a customer order is entered 4. Through customer interaction access to 'sticky' information providing basis for gaining deep customer know-how and identifying customer demand sets 5. Commonality in product and process designs provide technical basis for standardization and thus capturing and utilizing reusability 6. Loosely connected supply chain constituents provide enough flexibility for enabling the firm to serve varying and changing customer needs 7. Tight connections among supply-chain actors for allowing prompt, synchronous reaction to differentiated customer needs 8. Managing information intensity through modern ICT reducing complexity and allowing to establish value processes eliminating waste on all levels	- Integration - Scale - Scope - Integration - Scale - Scope - Substitution - Scale - Scope - Integration - Integration - Integration - Learning		

C.2. QUALITY BASED CHS

C.2.1. A GENERIC CONCEPTUALIZATION OF QCHS

Quality can be differentiated in internal and external quality. In general, internal quality is oriented towards a firm's internal system allowing for example high conformance to pre-determined specifications or requirements, loss avoidance and uniformity around a target value such as 'defects per million opportunities' (Gilmore H. L., 1974; Levitt, 1972; Crosby, 1979; Taguchi, 1992; Harry, 1988). Overall, internal quality provides an answer to the question of ‚how precise the product corresponds to the set technical target values?' (Kordupleski, Rust, & Zahorik, 1994, p. 62). However, in this line of reasoning, internal quality is only of marginal value, if it is not leading to actual customer perceived quality or put differently, 'quality in a product or service is not what the supplier puts in. It is what the customer gets out and is willing to pay for" (Drucker, 1985).

Correspondingly, external quality is oriented towards the customer and is often interpreted in management literature as fitness for use, meeting and/or exceeding customers' expectations, or generating customer value (Juran & Gryna, 1988; Grönroos, 1983; Parasuraman, Zeithaml, & Berry, 1985; Abbott, 1955; Feigenbaum, 1951). Especially the last aspect is important for this thesis, as this perspective includes the customer's view on both the actual quality *and* the selling price of the product (Feigenbaum, 1951). Thus, product quality becomes inseparable from product cost and vice versa (Feigenbaum, 1951). In that sense, external or 'actual' quality provides the answer to the question 'how valuable is the product perceived by customers?' (Kordupleski, Rust, & Zahorik, 1994, p. 62). In that sense, QCHS are 'value strategies from a customer point of view'. However, the 'value perspective' illustrates another important characteristic of quality: its relative nature (Kordupleski, Rust, & Zahorik, 1994).

Customer quality cascades in objectively measurable technical quality and subjectively evaluated quality (Buzzell & Gale, 1989). Objective quality focuses mainly on aspects such as primary functions of a product's operating characteristics and features, which are measurable, but includes also secondary product and service functions such as reliability, conformance, durability or serviceability (Garvin, 1984). Contrary, customer's psycho-social motives dominate subjective quality for which product features maximizing net pleasure or avoid unpleasure, allowing social distance or adoption, or providing security or fear avoidance are central (Fleck, 1994, p. 121). Typically, objective and subjective quality correlate for products predominated by objectively measurable, technical features (Bohn, 1993, p. 72). Further-

more, both external types aim at positioning a product's performance through its primary and secondary functions as close as possible to customers' preferences (Ringlstetter & Kirsch, 1991). However, while individuals may assess the characteristics of a product or service similarly, they typically differ in their reactions to different characteristics (Lancaster, 1971, p. 7). Thus, while customers assess a product's *performance* based on its objective characteristics, *the relationship between performance and quality* is reflected by individual reactions (Garvin, 1984). Consequently, customers evaluate products differently and take purchase decisions based on the expected contributions to fulfilling their individual wishes (Bohn, 1993). Value depends in this definition on a product's fit with customers' diverging subjective consumption purposes (Ringlstetter & Kirsch, 1991). The better a product fulfils a consumption purpose, the higher customer's perceive its relative quality and its corresponding value. Hence, a firm A's product performance is of superior value, if the distance to a customer's wanted performance is less than a firm B's product performance. This means in strategic terms that firm A achieves a differentiation advantage relative to firm B through product quality (Ringlstetter & Kirsch, 1991, p. 564).

Quality is frequently associated with higher average product cost, if quality is achieved through investments in inspections and rework (Reitsperger, Daniel, Tallman, & Chismar, 1993). However, on the other hand, 'an economic level of quality where the total cost of added quality and of lost customers is minimized' exists (Reitsperger, Daniel, Tallman, & Chismar, 1993, p. 9). This trade-off needs to be overcome by vital QCHS. This is achieved by two mechanisms operating on external and internal quality simultaneously (Garvin, 1984). The first mechanism is triggered by increased external quality and impacts a firm's product differentiation and cost. It starts with improving a product's primary and secondary functions such as performance, features or reliability. This external quality perception can be further enhanced through improved reputation by for example marketing. Through this, both objective as well as subjective quality is addressed leading to rising market share *and* higher prices. While higher market volume allows for economies of scale and thus, indirectly lowers a product's average cost, higher prices lead to higher product margins. Both effects positively impact firm profitability (Garvin, 1984). In addition, the second mechanism focuses on a firm's internal quality and directly reduces a firm's product cost. It is triggered by a higher degree of conformity to specifications. This increases firm productivity, lowers scrap and rework and diminishes product warranty and liability cost (Garvin, 1984).

Thus, the basic economic dilemma of quality is 'to strike the optimum balance between cost of quality and value of quality for each quality characteristic' (Juran, 1951, S. 8). The theoretical degree of optimal

quality is then the point marginal quality cost equal marginal quality revenues (Fleck, 1994). In consequence, ‘the difference between 'production costs' and 'quality costs' is artificial as quality costs do not exist as a category opposed to production costs and therefore strictly speaking, do not exist at all. This does not mean that it is unimportant to analyse the relationship between cost and quality. Rather the contrary, this relationship has been the pivot of our theoretical discussion’ (Sittig, 1963).

Overall, vital QCHS concepts need to compensate raised costs for coordination and alignment as well as upfront investments in preventive quality systems through economies of quality caused by lower total quality cost of prevention and economies of scale and scope induced by volume effects from superior quality. „An expanding literature and increasing number of producers are becoming part of the Total Quality Management movement. At its essence, the quality movement states that improved product quality and reduced production costs are positively related. Improved quality reduces costs” (Reitsperger, Daniel, Tallman, & Chismar, 1993, p. 8). Thus, vital QCHS need to maximize ‚quality of conformance’ meant as process oriented preventive quality and combine it with ‚quality of design’ meant as customer perceived product quality (Juran & Gryna, 1988). A concept describing the combination of both is total quality management (TQM) in general and *quality function deployment* (QFD) in particular (Kordupleski, Rust, & Zahorik, 1994, p. 61). In that sense, QFD represents the logical advancement of TQM: while early quality initiatives focused on reducing process variability in manufacturing, later efforts focused on re-engineering the upstream activities of product design and development, where the opportunity to influence the cost and lead time of new products is greatest (Cristiano, Liker, & White, 2000, p. 286).

QFD major objective is to integrate customer requirements into product design and production (Akao, 1990; Prasad, 1998). Therefore, QFD is often termed also ‚perceived-quality-deployment’ as it allows integrating customer satisfaction and internal process execution through focusing on perceived customer quality – the quality of design – *and* continuous design and process improvements – the quality of convergence. QFD is holistically oriented on increasing preventive quality through including ‘the voice of the customer’ in all stages of product development and production such as in marketing, design, planning, process development, or production control (Govers, 1996). By this, traceable links from the shop floor back to customer requirements can be provided to workers on how their job function impacts customer satisfaction (Cristiano, Liker, & White, 2000, p. 289). ‘It begins with a matrix that links customer desires to product engineering requirements, along with competitive benchmarking information, and further matrices can be used to ultimately link this to design of the manufacturing system’ (Cristiano, Liker, &

White, 2000, p. 286).In essence, the customer voice drives all activities in QFD, which is contrary to many companies in which the executive's or engineer's voice dominate (Govers, 1996). Bearing that in mind, QFD is a process applying a structured methodology using all relevant information and experiences that are available throughout the organization in order to help firms to trade-off between what customers want and what they can afford to build (Govers, 1996).

In the USA, the typical, structured approach to QFD centers around a four-phase model popularized by the American Supplier Institute consisting of a set of matrices that relate inputs to outputs (Terninko, 1995; Cristiano, Liker, & White, 2000). According to Cristiano et al. (2000) the phases can be described as follows: The first phase of QFD, often called product planning, quality matrix, or house of quality, converts qualitative customer requirements into product design, and measurable characteristics. Based on customer's desired level of performance these characteristics are prioritized and compared with competitors, and the final design is selected. The next phase relates quality characteristics to design components or parts. This indicates which design parts are important and able to achieve the customer desired performance level. In phase 3, only those few important parts are related to the manufacturing processes applied for producing the parts. Thus, phase 3 connects important product parts with manufacturing. This is achieved by linking important design components' quality target values with process target values. These target values in turn are used for prioritizing manufacturing processes and specifications, which are finally applied in phase 4 for deriving 'work instructions, control and reaction plans, and training requirements necessary to ensure the quality of key parts and processes' (Cristiano, Liker, & White, 2000, p. 289).

C.2.2. Linking QCHS competitive advantages, activity drivers, activities, capabilities and resources

As described above, QFD requires unique operational characteristics detailed in the following. Therefore, differentiation and cost drivers are discussed, before core activities and their interdependencies are identified. Figure 8 provides an overview on QCHS generic concept, key activity drivers, activities, capabilities and resources.

C.2.2.1. COMPETITIVE ADVANTAGES AND ACTIVITY DRIVERS OF QCHS

DIFFERENTIATION DRIVERS AND ADVANTAGES

Central to the concept of QFD is the inclusion of 'the voice of the customer' and thus, ultimately customer satisfaction. Customer satisfaction can be defined as post-consumption evaluation depending on customer's perceived quality or value (Yi, 1991). Satisfaction can be achieved on levels of products, transactions, brands or even firms (Anderson & Fornell, 1993). Customer satisfaction can be further decomposed in three distinct elements: quality, confirmation or disconfirmation, and expectation (Anderson E. W., 1994). Previous research found that quality is often having a greater impact than confirmation and disconfirmation or expectations on customer satisfaction (Churchill & Suprenant, 1982; Oliver & DeSarbo, 1988; Anderson & Sullivan, 1993). However, confirmation and disconfirmation is essential for understanding how quality is evaluated by customers. Confirmation and disconfirmation influences the customer comparing a product's or service's quality with a norm or standard and confirming or disconfirming a product's compliance with this standard is generating high or low satisfaction (Yi, 1991; Oliver, 1980). However, these effects are asymmetric with disconfirmation having greater impact on customer satisfaction than confirmation (Anderson E. W., 1994; Anderson & Sullivan, 1993). Furthermore, expectations are impacting customer satisfaction in two ways: First, by providing an anchor for confirmation and disconfirmation and second, by incorporating future customer information on expected product or service quality (Anderson, Fornell, & Lehmann, 1994). Altogether, it can be summarized that product quality significantly impacts customer satisfaction (Juran & Gryna, 1988; Anderson E. W., 1994). Quality driven customer satisfaction, in turn, drives brand loyalty and raises repurchase intentions of the customer (Reed, Lemak, & Montgomery, 1996; Matzler & Hinterhuber, 1998). This effect is indirect through perceived product quality impacting customer satisfaction and in turn develops customer loyalty over time (Devaraj, Matta, & Conlon, 2001, S. 427). Additionally, quality driven brand loyalty and reputation is lowering a customer's transaction costs as it reduces uncertainty and lowers cost of search, coordination and negotiation of repurchases (Reed, Lemak, & Montgomery, 1996; Matzler & Hinterhuber, 1998). Furthermore, brand loyalty lowers customer price sensitivity and allows realizing higher prices (Reichheld & Sasser, 1990; Rust, Zahorik, & Keiningham, 1995). Overall, price is frequently perceived by customers as a cue to quality and thus, higher prices can reinforce customers' quality perception (Rao & Monroe, 1989). Taking this logic to the extreme, product quality is raising the likelihood of repurchases assuming that 'customers are willing to pay a premium for a higher quality product and do not necessarily

view price as a deterrent to the purchase decision' (Devaraj, Matta, & Conlon, 2001, S. 434). However, rather than purely considering price in their decision making, customers decide on a product's price-performance-ratio and thus, customer value is another differentiation driver of quality (Fritz, 1994).

In addition, the uncertainty of new customers is reduced through high quality products' attractiveness (Matzler & Hinterhuber, 1998). Thus, new customers are attracted for example by word-of-mouth or published product tests from external institutions, while current customers are affirmed for example by high reliability or realized product value. Both leading to reduced cost through either lower acquisition cost or lower service and repurchase cost (Devaraj, Matta, & Conlon, 2001; Matzler & Hinterhuber, 1998).

Product reliability is adding another quality differentiation driver as customers want to operate a product in a specified way, for a prescribed number of times, and under given conditions (Garvin, 1988; Hunt V. D., 1992). Thus, product failures in the field can increase a customer's production cost through for example unplanned maintenance and rise transaction cost through additional coordination efforts for eliminating the errors. This effect is of special importance for business customers utilizing products as production machinery with each failure causing business impact.

Finally, quality allows differentiating a firm's products from rival offers and increases barriers to imitation for new and incumbent competitors (Fleck, 1994). However, simply differentiating by product quality and functionality is becoming harder and harder to achieve (Diller, 1988). Consequently, next to a product's objective quality advantage, customer's need to be persuaded of the subjective superiority of the product, requiring accompanying MS activities. Only then firms deploy their full potential of competitive differentiation (Fritz, 1994).

COST DRIVERS AND ADVANTAGES

One central concept for quality oriented cost reductions are 'economics' or 'economies of quality' (Juran, 1951, S. 8; Fleck, 1994). Economics of quality result either from increasing preventive quality measures or from sharing common quality institutions. In the following, both types of economics of quality are discussed.

A comprehensive view on *preventive quality* cost effects requires to include consequential or indirect quality cost, which are hard to quantify and for that reason, are often excluded from traditional calculation schemes (Cole, 1992). Such indirect costs comprise for example construction improvements, comprehen-

sive guarantees, losses of customers, increased sales efforts, negative word-of-mouth, or loss of reputation (Meyer, 2003). Irrespective from being controlled and regarded, these cost effects can be substantial (Cole, 1992).

Examining conventional quality cost categories is leading to distinguishing appraisal, failure and prevention cost (Fleck, 1994). Applying this categorization to strategic management reveals that failure and prevention cost are action oriented as they arise either by avoiding cost at an early stage or correcting failures as soon as possible after their occurrence, while appraisal cost are inclusive to both these actions.

Thus, from a management or action oriented point of view, only two categories remain representing cost of conformity and cost of non-conformity. Thereby, cost of conformity and cost of non-conformity contrast sharply in terms of their efficiency. While the first generates additional value for a firm, the latter is representing inefficiencies in form of preventable double effort for correcting failures after their occurrence. Consequently, failure cost are often termed cost of the 'hidden factory' or the 'hidden plant' as 'good quality reduces the so-called hidden plant: people, floor space, and equipment used for nothing but finding and fixing things that should have been done right the first time. This typically represents 25% to 35% of total production cost' (Therrien, 1989, p. 112; Miller & Vollmann, 1985).

While preventive quality cost are clearly cost of conformity, appraisal cost include both, cost of conformity such as cost for quality audits or design reviews as well as cost of non-conformity such as sorting out deficient parts. Moreover, taking into consideration that delayed discovery and correction of defects is driving cost, it becomes obvious that cost optimal quality is at 'zero-defect'-level rather than at a predetermined error rate (Wildemann, 1992, p. 763). Accordingly, detecting defective parts early for example at goods receipt is less costly than detecting failures at final inspection leading to partial or complete loss of value-add included in the product. Thus, a firm's internal quality directly reduces a firm's product cost triggered by a high degree of conformity to specifications. This, in turn, increases firm productivity, lowers scrap and rework, and diminishes product warranty and liability cost (Garvin, 1984). However, as shown by previous research a correlation between reducing a firm's quality costs and enhancing its product and service quality investments in quality prevention exist (Elshazly, 1999). As these positive cost effects occur from the start of the preventive quality system, they are also called 'start-up economies of quality' (Fleck, 1994).

Next to 'start-up economies of quality' preventive quality systems allow realizing further cost reductions in form of economies of scale and scope. This is caused by the change of character resulting from

transforming a quality system from corrections to preventions. By this, preventive quality becomes institutional in nature, which is best illustrated by the allocation possibilities of conformative and non-conformative cost. While preventive costs are general in nature and cannot be allocated to individual product units, non-conformative cost are depending on erroneous products and product units and can be allocated to products individually (Wildemann, 1992, p. 766). Thereby, positive direct cost implications result from volume variation (scale economies), utilization of quasi-public-goods (scope economies), and learning (learning effects) (Day & Montgomery, 1982, S. 56). Thus, the general cost character of preventive quality founds the basis for economies of scale through variations of volume and economies of scope through utilization of preventive quality institution as quasi-public goods (Willig, 1979, p. 346). However, both advantages depend heavily on utilizing or operating the preventive quality system leading to term them as '*operating economies of quality'* (Fleck, 1994). Higher utilization, in turn, driven by quality induced volume effects is creating higher customer satisfaction and loyalty, increased demand, elevated market share and eventually reduced general cost *per unit* of the preventive quality system (Phillips, Chang, & Buzzel, 1983; Powell, 1995). "That is, attaining high levels of quality creates the potential to pursue not only a differentiation strategy, but also a low cost leadership strategy within a market" (Belohlav, 1993, p. 62). This is in line with research findings indicating that superior quality increases brand loyalty and raises customers repurchase intentions, which in turn decreases a firm's repurchasing transaction cost (Reed, Lemak, & Montgomery, 1996; Matzler & Hinterhuber, 1998). Also, product quality is attracting new customers and allows sustaining existing ones (Devaraj, Matta, & Conlon, 2001; Aaker & Jacobson, 1994; Anderson, Fornell, & Lehmann, 1994; Fornell, 1992; Anderson E. W., 1994). New customers are attracted through word-of-mouth from satisfied customers and allows serving existing customers more efficiently, both leading to lowering marketing and service cost (Devaraj, Matta, & Conlon, 2001; Matzler & Hinterhuber, 1998).

Furthermore, operating a preventive quality system provides a basis for learning, which can move conformance toward zero defects as process improvements eliminate quality problems (Reed, Lemak, & Montgomery, 1996; Fine, 1986). This definition of learning is mainly based on existing products and is thus more oriented toward control focusing on repetitive activities (Sitkin, Sutcliffe, & Schroeder, 1994). However, learning can also be future oriented focusing on new products and process innovations. The basis is founded by QFD by interrelating 'internal organizational states and processes and external environmental demands' (Lawrence & Lorsch, 1967, S. 134). By this, it provides the basis for generating

future oriented learning reducing future failure costs, which are otherwise likely to occur (Sitkin, Sutcliffe, & Schroeder, 1994). That way, successful quality driven Japanese firms apply QFD as a tool for organizational learning by distributing the knowledge generated by previous studies for training purposes and starting points for new QFD studies (Cristiano, Liker, & White, 2000). Hereby, the effectiveness of new and existing employees can be increased in a shorter period of time (Cristiano, Liker, & White, 2000). Additionally, operating a preventive quality system over time fosters a better understanding of customers' requirements and what is needed to meet these requirements. This, in turn, founds the basis for transferring knowledge and improving products resulting in lower lead times, fewer product and production problems and eventually less cost (Govers, 1996).

Next to the above mentioned ‘economies of quality’, additional positive cost effects can be realized. In product design, efficiencies resulting from including ‘the voice of the customer’ and thereby creating better and more efficient product designs can be substantial (Reed, Lemak, & Montgomery, 1996). ‘The implementation of QFD reportedly results in many significant improvements in the product design and development process, starting with customer requirements and how these relate to engineering characteristics’ (Cristiano, Liker, & White, 2000, p. 289). Furthermore, identifying customer oriented ‘quality characteristics’ in product design allows focusing resources selectively and efficiently on the few important, customer perceived quality components. By this, component specifications correlate with process target values and specifications and manufacturing processes and specifications for key process parameters. Consequently, this allows focussing on only those activities ‘necessary to ensure that the quality of key parts and processes is maintained’ and thus, reduces internal value chain complexity (Cristiano, Liker, & White, 2000, p. 289).

In addition, deploying QFD, which is primarily concerned with the relationship between customer needs and new product attributes, requires internal and external collaboration such as for example cross-functional QFD teams. While generating additional cost from cross-functional alignments at the beginning, QFD substantially reduces efforts for e.g. post-design adaptations, re-planning and rework possibly affecting a firm’s manufacturing, logistics, sales, or service function (Reed, Lemak, & Montgomery, 1996; Ahire & Dreyfus, 2000). Hereby, cross-functional collaboration has a key role in understanding the linkage between pre- and postproduction quality issues (Ahire & Dreyfus, 2000). Furthermore, the full

use of QFD across the various stages of the process can reduce product development time and ease production start-up (Cristiano, Liker, & White, 2000).

However, QFD has also *cost increasing effects*: First, it does *not yield all expected benefits instantly*, and second, it raises running cost through *operating the preventive quality system*. Typically, applying QFD initially requires time and additional effort, which increases cost and postpones the occurrence of counterbalancing benefits (Govers, 1996). The expected benefits typically require time to occur as new processes, new organizational structures need to be established and new technologies need to be learned (Reed, Lemak, & Montgomery, 1996). An example for a new process to be learned is data driven competitor analysis revealing a firm's relative technical position compared to rivals (Govers, 1996). However, as soon as employee experience accumulates the firm moves down its new cost curve and eventually can reach points below its initial cost level (Reed, Lemak, & Montgomery, 1996). Similarly to cost, *price is also impacted by the time delay* between initiating QFD and reaping its benefits. As mentioned above, quality allows charging higher prices to customers as they are more willing to purchase products with higher perceived value. If quality then leads to customer confirmation, satisfaction is generated and the likelihood of repurchases is increased. Furthermore, higher product quality and reliability leads to customer satisfaction and reduces the frequency of repurchases. However, until building up a high quality reputation in the market, firms often face an interim period in which price levels are comparatively low. This led Reed et al. to conclude, "the lost revenue can be made up through being able to charge a higher price for better reliability (differentiation), that cannot be done until the reputation for reliability has been established. Like the payoff from improved process efficiency, it seems fair to believe that the payoff from enhanced product reliability will take a substantial amount of time to materialize" (Reed, Lemak, & Montgomery, 1996, S. 188).

Furthermore, operating a preventive quality system typically requires *additional investments and efforts* and *increases a firm's internal complexity*. In that line of vein, QFD investments is represented by for example management commitment, cross-functional teams, as well as money allocated to QFD studies for collecting customer requirements (Cristiano, Liker, & White, 2000; Detert, Schroeder, & Mauriel, 2000). In this respect, QFD regards studies as investments in the product and in the team. In addition, building up the necessary organizational structure and processes, and developing a quality oriented culture is time consuming and costly. Thus, QFD similarly to TQM is characterized by values of truth and rationality

represented by scientific methods and data based decision-making leading to term this often ‘management by fact’ (Detert, Schroeder, & Mauriel, 2000; Juran, 1988). Additionally, QFD may increase a firm’s complexity through requiring concurrent attention to customer requirements, competitors’ offerings and cross-functional coordination (Reed, Lemak, & Montgomery, 1996). Anecdotal evidence shows that one way dealing with this increased complexity is not to apply the full range but only a selection of QFD tools (Cristiano, Liker, & White, 2000). Finally, QFD requires higher initial investments in preventive quality systems, which increases a firm’s cost of capital.

C.2.2.2. DETERMINING A QCHS CORE ACTIVITIES, CAPABILITIES AND RESOURCES

Many activities, capabilities and resources are similar in quality systems following a correction versus prevention logic, some activities, capabilities and resources, however, differ. The following presents the core primary and support activities, which are mainly located in RD, purchasing, operations, outbound logistics and marketing (Hamel, 1994).

The voice of the customer is of central importance for QFD (Brown, 1991). Consequently, firm’s applying QCHS need to be strong in ‘identifying customer needs, structuring customer needs, and providing priorities for customer needs’ (Griffin & Hauser, 1993; Gaskin, Griffin, Hauser, Katz, & Klein, 2010). Thereby in practice, customer information is not differentiated in retrospective and prospective information, rather the focus is on collecting and analysing the information (Cristiano, Liker, & White, 2000). This indicates QCHS strong ‘ability to understand and address customer needs’ from a marketing, sales and service perspective and considering this understanding in manufacturing and operations (Cristiano, Liker, & White, 2000). While for new products quantitative as well as qualitative market research techniques such as focus groups, one-on-one interviews, or group consensus (affinity) charts are applied, for existing products the focus is more on available firm data such as customer complaints or warranty cases (Griffin & Hauser, 1993). Sometimes, market research techniques on new or existing products can collapse such as for interviews taking place at customer visits, which are capable of capturing information on both new and existing products due to their contextual or ethnographic nature (McQuarrie, 2008; Gaskin, Griffin, Hauser, Katz, & Klein, 2010). In summary, a firm’s marketing, sales and services activities sustain or foster customer closeness founding the basis for collecting such ‘relationship based information’.

Moreover, as perceived quality of products is relative to the range of products or services offered in the industry, QCHS firm’s need to evaluate its offerings’ price-performance level compared to its competi-

tors. ‘Customers choose between products of different brands. Therefore, it is of strategic importance to know how the products of our most important competitors match up to the customer requirements compared with our own product’ (Govers, 1996, S. 579). Thus, competitive benchmarking is a key activity for deriving the firm’s relative technical position allowing focusing all value chain activities on achieving customer perceived quality (Govers, 1996).

Based on customer and competitor knowledge, a firm’s product design function needs to transfer the qualitative customer requirements into design specifications and product characteristics. „Of all the steps in the total production development process, none deserves more and receives less attention than the definition of the right product for the right customer. This first step is the most critical part of the process and it usually is the most difficult because it requires obtaining and expressing what the customer truly wants and not what we think he or she expects. The greatest gains of QFD will be realized when the “voice of the customer” gets to be deployed to the most detailed level of manufacturing operations. This means deploying all phases although it is possible to achieve substantial benefits by implementing QFD only in the first phase. (Govers, 1996, S. 577). Accordingly, QCHS possess strong capabilities in product development, design and construction.

Furthermore, ‘superior product designs must be accompanied by efficient and high quality manufacturing processes to yield superior market performance’ (Ahire & Dreyfus, 2000, p. 568). In that sense, product *and* process quality needs to be realized along the overall value chain in an integrated system of quality management (Fritz, 1994). Thus, the level of process stability already achieved by a firm can be seen as an important precondition for achieving customer and competitor orientation. ‘A company that still struggles with the quality performance at the expected and the specified level, has to stress basic quality techniques first and to change the culture towards more Total Quality Management’ (Govers, 1996, S. 584). The underlying logic for this is that an instable quality level of internal manufacturing processes would compromise the achievement of the ex ante developed, external quality directed design specifications. If firms fail to transfer these design specifications in manufacturability and process considerations, promising designs are not converted in high quality products (Dean & Susman, 1989; Ahire & Dreyfus, 2000). Thus, firm’s successfully implementing QFD should have reached a high level of process orientation through for example applying process control or systematic problem solving (Govers, 1996).

Continual quality improvements, another essential key to TQM in general and QFD in particular, require a multifaceted performance management including for example frequent performance reviews, performance monitoring or quality oriented incentive systems (Deming, 1986; Dean & Bowen, 1994; Juran, 1989). For that reason, data is needed and analysis is required for determining appropriate actions for improving the processes (Webster, 2002). Bearing that in mind, HRM practices - such as performance rewards, trainings, and involvement in decisions - focusing on shop floor workers are important as they encourage and motivate employees (Webster, 2002). Furthermore, quality can be interpreted as a firm's potential or 'potential quality' meaning for example a firm's quality relevant know how or capabilities, or its motivated employees (Fritz, 1994). Critical for establishing such practices is management's performance evaluation and incentives driving market and customer orientation (Webster, 2002). Consequently, QCHS require specific employee focused HR practices supporting performance management.

Deploying customer requirements in manufacturing systems requires firms to decompose and reconstruct their value chain. Firm's need to transfer their customer knowledge in manufacturability and process considerations for achieving high quality products; otherwise no quality advantage can substantiate (Dean & Susman, 1989; Ahire & Dreyfus, 2000). Successful design developments and transfers depend highly on aligning and composing a firm's value chain functions with cross-functional teams from diverse disciplines such as product planning, marketing, engineering or manufacturing (Govers, 1996; Cristiano, Liker, & White, 2000). This demand QCHS firms to be system oriented in providing 'activities that bring together all required disciplines to work and plan the development efforts in a highly disciplined, communicative and effective manner' (Govers, 1996, S. 585). The evaluation model of the ‚European Quality Awards' stresses the significance of system orientation as it includes on the second and the third highest quality levels 'internal system orientation' and 'external value chain orientation'. Thereby 'internal system orientation' is meant as controlling all functions of the organization (Govers, 1996), whereas 'external value chain orientation with suppliers and customers' is separated in making optimal use of knowledge and capabilities for customer satisfaction and seeking cooperation in order to minimise costs (Govers, 1996). In this line of reasoning, customer-perceived quality is obtained by focusing all value chain activities on creating value for the customer (Mohr-Jackson, 1998). Further, this could explain the fact that larger firm's, having already established a system and chain orientation, are more successful in implementing QFD than smaller or medium ones (Govers, 1996). In that sense, firm's following QCHS

are stronger oriented towards processes than products, even if the initial starting point of this process focus are product characteristics expressed through customer expectations (Govers, 1996). In consequence, QCHS possess distinct decomposition capabilities in regards to transferring customer preferences in product characteristics, manufacturing specifications, and manufacturing target values as well as composition capabilities in terms of orchestrating a firm's internal and external value chain. This composition or combination capability accompanies a necessity to reuse as many firm resources and capabilities as possible (Govers, 1996). In that sense, QFD serves not just as a unidirectional concept solely applied for implementing all customer perceived preferences; rather, it is bidirectional and allows evaluating also a firm's possibilities and potential (Govers, 1996). Therefore, QCHS need to have strong capabilities in reusing existing resources and capabilities. However, this capability is not restricted to a firm's own, internal resources and capabilities, but includes external value chain resources and capabilities a firm can control or influence. Especially this last capability suggests that QCHS have certain strengths in establishing cooperation with external partners. In contrast, coopetition meaning cooperation between competitors is rather unlikely due to QCHS strong benchmarking orientation fostering the development of distinctive products better fitting customer preferences.

Moreover, cross-functional, internal system orientation requires participative management and employee empowerment. This demands line managers to empower employees for creating trust, openness, receptivity to ideas and adoption of flexible approaches for satisfying customers (Mohr-Jackson, 1998). On the other hand, this needs to be accompanied by enabling employees through education and training (Mohr-Jackson, 1998; Keogh, Atkins, & Dalrymple, 2000). "Consequently, employees feel free to contribute to quality and customer satisfaction without being fettered by either authoritative management, organizational structural obstacles, or bureaucratic red tape." (Mohr-Jackson, 1998, p. 116). Thus, 'staying power, communication skills, low desire for total control, and respect to the abilities of the people' characterizes the management approach (Mohr-Jackson, 1998, p. 115).

The total of qualitative and quantitative market research, decomposition, alignment and coordination along the overall value chain and delegation of decision competencies require considerable technological capabilities in information and communication. In that sense, Govers speaks of QFD not as 'a panacea for solving design problems nor for developing "perfect" products. It refers to deploying a customer's desires. It can be an excellent tool to plan and control the development process. Rather it is suited to improve process management and policy deployment by better communication and employee involvement'

(Govers, 2001, S. 158). This is reinforced by the necessity of operatively and strategically evaluating alternative product and process scenarios (Wilson & Collier, 2000, p. 396). Accordingly, two of seven ‚Malcom Baldrigde National Quality Award Model' award criteria are linked to these strategic information and analysis capabilities (Wilson & Collier, 2000, p. 396). First, 'measurement, analysis, and knowledge management' as the 'main point within the criteria for all key information about effectively measuring, analyzing, and improving performance and managing organizational knowledge to drive improvement, innovation, and organizational competitiveness. In the simplest terms, category 4 is the "brain center" for the alignment of your organization's operations with its strategic objectives. Central to such use of data and information are their quality and availability. Furthermore, since information, analysis, and knowledge management might themselves be primary sources of competitive advantage and productivity growth, this category also includes such strategic considerations' (National Institute of Standards and Technology (NIST), 2013-2014). While the second, 'strategic planning' focuses more on a firm's decision making about core competencies and work systems as an integral part of ensuring the firm's sustainability (National Institute of Standards and Technology (NIST), 2013-2014). This is supported through previous research finding evidence for an extensive use of for example customer satisfaction measurement system for obtaining reliable information over time, applying scenario techniques for supporting strategic management decisions, or spreading operative and strategic information among specialists across departments so everybody can contribute to the process by his observations (Mohr-Jackson, 1998; Govers, 1996, S. 583).

On top of that, ICT is supporting another capability of QCHS: to share and reuse knowledge. This is of immanent importance, as QFD demands fast transfer of customer requirements into product characteristics, of product characteristics into design and construction specifications, as well as design specifications in manufacturing specifications and work instructions. Thus, QFD allows quickly transferring knowledge efficiently and effectively (Cristiano, Liker, & White, 2000, p. 292). Additionally, employee empowerment is reinforcing the importance of knowledge sharing and reusing as it requires employees on all levels to know, understand and consider customer requirements and needs. Correspondingly, QCHS requires a ‚knowledge-based approach" for dealing with the massive amount of information (Kim, Han, Choi, & Kim, 1998; Cristiano, Liker, & White, 2000)..

High pace and quality of new product developments typically requires strong RD capabilities for developing customer specific products rapidly and efficiently. However, as the design cannot be autonomously

developed by the RD, strong interaction for example with the design and quality assurance functions for understanding the linkage between pre- and postproduction quality issues is necessary (Ahire & Dreyfus, 2000, p. 555). In turn, this requires collaboration encompassing the whole organization for providing the basis for a ‚concurrent planning and designing process' in which all affected functions are actively involved (Deschamps & Nayak, 1995). By this, QCHS ensure the development of efficient product-process-combinations (Wheelright & Clark, 1992). 'The concurrent engineering approach involves participants from all parts of the supply chain in the design process. The participation of customers and the marketing function in the design process ensures the technical feasibility of the product ideas. Finally, coordination among the design, purchasing, and production functions improves design and implementation of appropriate product-process-combinations, resulting in a cost-effective production system. (…) These cross-functional practices typically suggest early interaction among marketing, product design, manufacturing, quality assurance, and new product development functions." (Ahire & Dreyfus, 2000, p. 555). Consequently, specific collaboration activities and capabilities need to be assisted by planning activities and capabilities strongly involving functions and departments on the one hand and restricting their decision autonomy on the other hand *during product development*. In that sense, similar to modular concepts of VCHS, it is mandatory to align product and process specifications with all affected parties as early as possible for founding the basis for each function and department to provide their individual contributions more or less autonomously.

One reason for TQM implementations to fail is often a lack of appropriate human resource and cultural policies and encouragement (Samson, 1997; Hawley, 1995). In that sense, prevention programs are typically impeded by behavioral barriers such as long-term-vision, innovation and change of status quo rather than by economic obstacles (Keogh, Atkins, & Dalrymple, 2000). Therefore, successfully applying QCHS necessitates a culture oriented towards three main cultural orientations: quality, customers, and competitors (Irani, Beskese, Love, & D., 2004; Lakhe & Mohanty, 1994). While the first aspect dictates the main organizational focus, the last two are directed to external requirements.

As quality is a continuous and often long lasting endeavor, firms following a QCHS must have a culture emphasizing long-term orientation and continuous improvement (Detert, Schroeder, & Mauriel, 2000). In that line of argument, it is not enough from a cultural point of view to identify the problem, to formulate the solution and present it to management, rather the source of the issue needs to be remedied (Keogh,

Atkins, & Dalrymple, 2000). Keeping that in mind, quality oriented organizations need to establish a culture committed to customer satisfaction, what requires from a cultural perspective a combination of people and process power (Irani, Beskese, Love, & D., 2004, S. 645; Lakhe & Mohanty, 1994; Chowdhury, 2005). Also, the culture needs to encourage education and employee empowerment allowing all employees to be involved in decision making and in supporting the shared vision (Ahire & Dreyfus, 2000; Irani, Beskese, Love, & D., 2004; Pool, 2000; Detert, Schroeder, & Mauriel, 2000). This coincides with previous findings in production and operations research suggesting that educated and empowered employees focusing on continuous improvement foster process quality (Galagan, 1992).

In addition to QCHS cultural specifics of education and empowerment, decisions are made on a factual or scientific basis (Detert, Schroeder, & Mauriel, 2000; Cristiano, Liker, & White, 2000). This is often called ‘management by fact’ based on the idea cause and effect based systems require measurement and data to make improvements (Flynn, Schroeder, & Sakakibara, 1994; Juran, 1988; Detert, Schroeder, & Mauriel, 2000). Thus, values of ‘truth and rationality’ underlie QCHS culture (Detert, Schroeder, & Mauriel, 2000; Juran, 1988).

Such factual decision making, however, calls for a transfer of external information in internal specifications demanding the culture to be perceptive and adaptive to external information. For doing so, the culture needs to support communication and knowledge exchange especially between marketing and design (Cristiano, Liker, & White, 2000). Only then, a clear understanding of the importance of quality for achieving the firm’s business objectives can be achieved and awareness on customers at all levels can be created (Lakhe & Mohanty, 1994; Womack, Jones, & Roos, 1992). In that instance, information and knowledge exchange is used for transition from a functional organization to cross-functional and cross-unit cooperation on products, processes, and structures especially in product and process development (Cristiano, Liker, & White, 2000). However, this collaboration is not restricted internally; rather external supply chain partners should be integrated as well. Thus, firm’s are oriented towards the overall value chain and not just its internal system (Fritz, 1994). Consequently, QCHS culture is characterized by internal cooperation as well as external collaboration (Detert, Schroeder, & Mauriel, 2000). Figure 8 presents an overview on QCHS underlying activities, capabilities and resources.

FIGURE 8: OVERVIEW QCHS

	Underlying concept	Activity drivers	Activity system and activities	Core resources and capabilities
Differentiation	1. Increase perceived quality through including 'the voice of the customer' 2. Highly qualitative, reliable products avoid/reduce a customer's costs of uncertainty and failures	- Reliability - Customer knowledge - Production cost - Transaction cost	I.1. Firm infrastructure (n=5) - Separate the value chain according to functions perceived by customers as important or unimportant - Decompose and reconstruct a firm's internal system and external value chain - Apply management with low desire for total control and respect to the abilities of employee - Cross-functional team collaboration - Establish collaboration across whole organization and with external partners I.2. HR management (n=3) - Share and reuse knowledge - Educate and train employees on quality management - Involve and empower employees on quality and continuous improvement I.3. Technology (n=2) - Apply efficient and high quality manufacturing system - Apply ICT application along value chain I.4. Purchasing - Integrate external supply and distribution partners II.1. Research and Design (n=6) - Focus on processes rather than products - Establish a concurrent planning and design process - Focus on continual improvement of design processes and product design - Include manufacturing early in product development - Include voice of customer in all stages of product development - Apply preventive quality for increasing overall product and process quality II.2. Inbound logistics II.3. Operations (n=5) - Focus on preventive quality in manufacturing - Continually improve operations - Apply customer information in form of customer required specifications in manufacturing - Integrate product development and production - Invest long-term in preventive quality and ICT II.4. Outbound logistics (n=0) II.5. Marketing and sales (n=10) - Establish close customer proximity through including customer requirements in product specification - Determine antecedent customer needs - Apply ICT for collecting and analysing information from existing and potential customers and competitors - Collect and enhance customer information through marketing, sales and service - Collect relationship based information on consumption purposes and perceived quality - Continually measure, analyse, and exchange knowledge on customers - Benchmark (customer perceived) competitor product quality constantly - Research focus on mass markets - Focus on customer perceived quality standards II.6 Service (n=1) - Service used for information collection	Operational resources (n=1) and capabilities (n=7) - Sufficient and long-term investment in preventive quality and ICT - Capability to implement and run ICT for determining e.g. design or manufacturing specifications - ICT capabilities allowing to processing high amount of information - Capability to run an efficiently and high quality manufacturing system - Organizational and individual learning based on customer information resulting from operating preventive quality system - Capability to identify, structure and prioritize customer needs captured by marketing, sales and services - Capability to sense customer preferences and transfer customer preferences in quality products - Capability to include voice of the customer in product development and manufacturing Management capabilities (n=11) - Management of value chain stages based on customer neutral or specific activities - Capability to balance external and internal quality through instituting preventive quality - Extensive knowledge management capabilities for reusing existing resources and capabilities - Capability to collaborate with external partners along the whole value chain - Integrating customer satisfaction and internal process execution through focusing on perceived customer quality and continuous design and process improvement - Capability to learn from operating preventive quality system - Capability to determine enduring customer requirements - Capability to involve employees in decision making and encourage education and training - Strategic planning capability - Provide product and process oriented target values - Capability to build lasting, learning customer relationship based on product longevity and reliability Company culture (n=7) - Culture of full commitment to quality and customer satisfaction - Culture fostering cross-functional and cross-divisional team collaboration as well as external partner integration - Culture fostering communication and knowledge exchange - Culture allowing employee participation and empowerment and fostering adaptability - Long-term orientation with focus on continuous improvement - Culture focusing on factual or 'quasi-scientific' decision making - Orientation towards mass markets
Cost	3. Increased product quality pushes customer satisfaction and leads to rising volumes through amplified customer acquisitions and repurchases 4. Establish a preventive quality orientation allows to fully avoiding or early detecting failures 5. Differentiation induced volume increases allow to highly utilize preventive quality institutions 6. Improve product designs through identifying customer oriented quality characteristics and focusing only on value chain activities driving quality from a customer perspective 7. Intense internal and external collaboration allowing to reduce overall value chain cost of low quality / failures	- Production cost - Transaction cost - Preventive quality - Operating quality - Scale - Scope - Learning - Production cost - Complexity - Preventive quality - Production cost - Transaction cost		

C.3. INNOVATION BASED CHS

'Time' or better 'time based' competition is for many industries and firms the new competitive imperative. Additionally, speed is essential for competing globally by applying frequently changing technologies for constantly varying customer demands (Birnbaum-More, 1993; Nijssen, Arbouw, & Commandeur, 1995; Wheelright & Clark, 1992). This requires faster product development in order to prolong product life cycles (Kessler & Chakrabarti, 1996). Thereby, central focus is attached to innovations – either in products, services or business models, or processes (Stalk G. , 1993). "Timely execution, as much as ideas, is the challenge to innovation. In fact, I believe that the traditional paradigm for corporate success – "provide the most value for the least cost" - has shifted to "provide the most value for the lowest cost in the least elapsed time". In order to achieve success, companies must substantially reduce the time required to conceive, develop, and introduce new products and services. Matching the pace of competitors is not enough" (Stalk G. , 1993, p. 15). Competing on speed involves all organizational facets and allows increasing profits and market share at limited costs and market risks (Page, 1993). However, 'as long as the global rate of change continues to accelerate, the competitor who not only recognizes the changes but acts on it can achieve a competitive advantage (Meyer C. , 1993, pp. 11-12).

C.3.1. A GENERIC CONCEPTUALIZATION OF ICHS

Schumpeter defines innovation as something new (Schumpeter, 1942). Underlying this understanding is incommensurability, which originated from Ancient Greek mathematics and means that 'no common measure' exists (Oberheim & Hoyningen-Huene, 2013). Being incommensurable doesn't mean that innovations are not comparable; rather it means that a common measure of comparability is not available. Innovation confronts customers with a bundle of functions and services, which cannot be measured on common standards applicable to existing products (Bohn, 1993). Thus, innovation is always leading to incommensurability, however not the opposite as products can be incommensurable without being innovative (Bohn, 1993).

Innovation is resulting from incremental, radical or fundamental RD (Roussel, Saad, & Erickson, 1991). While the first two categories are application-oriented, the last is focusing on basic research requiring a long-term orientation but has low relevance for strategic management and thus is excluded in the following discussion (Kupsch, Marr, & Picot, 1991). In contrast, incremental and radical innovation is faster and generates, from an external point of view, similar levels of novelty or distinctiveness. The dif-

ference between the two is the degree of internal novelty required to generate external innovation and is significantly higher for radical innovations than incremental ones. This corresponds to Roberts and Berry's 'familiarity matrix' consisting of the two dimensions 'newness relative to the firm' and 'newness relative to the outside world' (Roberts & Berry, 1984). Similarly, viewing from a technology life cycle perspective, incremental innovation represents moving along the same technology curve, while radical innovation results in leaping from one technology curve to another (Fleck, 1994, p. 132). Thus, incremental innovations exhibit hybrid characteristics through achieving external newness without requiring high levels of internal newness. The following describes this concept in more detail.

C.3.2. Linking IQHS competitive advantages, activity drivers, activities, capabilities and resources

Incremental innovation refines and extends established product or process design, while disruptive or radical innovations change core concepts and/or linkages among key components (Henderson & Clark, 1990, S. 11; Banburry & Mitchell, 1995). Thus, incremental change starts when the market accepts a new product design and ends when a new one displaces it (Marples, 1961; Sahal, 1986; Tushman & Anderson, 1986). Such periods of incremental innovations can last for many years (Utterback & Abernathy, 1975; Banburry & Mitchell, 1995). Moreover, they frequently play a key technical role in established industries and can substantially affect external change of functionality or price (Cohen, Teece, Tyson, & Zysman, 1984; Nelson & Winter, 1977; Dosi, 1982). Thereby, industry newcomers as well as incumbent players are sources of incremental innovation (Tushman & Anderson, 1986; Henderson & Clark, 1990; Cooper & Schendel, 1976; Von Hippel, 1988). The main difference between the two is that maintaining the competitive position requires incumbent firms to introduce most of the incremental innovations irrespective of being first mover or follower (Banburry & Mitchell, 1995).

However, being one of the first introducing incremental innovations has substantial benefits for both the incumbent as well as the newcomer firm. Benefits from incremental innovation result from internally achieved shorter product development cycles reducing development cost and increasing innovation speed, periods of product marketability and thus market share. In addition, higher prices can be charged through increasing product incommensurability and responsiveness perceived by customers.

Sources of increased product marketability are earlier market entry and extended product life enabled through shorter product development cycles (Smith & Reinertsen, 1992; Vesey, 1991). In that line of

reasoning, exceeding development budgets in favor of speed can lower reductions in profits than vice versa (Dumaine, 1989). 'The cost of a delay at the stage of the innovation cycle is actually the cost of the lost opportunity in the sales cycle. … In a sales window of five years, a six-month delay in the introduction of a new product has a bigger impact on profit before tax than even a 50 per cent increase in development cost' (Sonnenberg, 1993, p. 19). This is due to effects resulting from early market entry prolonging the period of time the product can be sold at initially higher prices and simultaneously establishing early market segments providing the basis for higher market shares and customer loyalty (Gee, 1978; Reiner, 1989; Stalk & Hout, 1990; Meyer C. , 1993). Moreover, market share impact also results from shorter product cycles allowing fighting against market share losses caused by product obsolescence of outdated products through a continuous stream of new products (Cordero, 1991). Additionally, a positive market share stimulus is induced by shorter development cycles enabling firms to faster respond to customer wishes or improvement needs and thus satisfy market demands (Meyer C. , 1993). Next to these internally focused effects, incremental innovation affects also customer external perceptions through higher prices, innovative products and firm reputation as well as products better fitting customer demands (Meyer & Purser, 1993; Reiner, 1989). Consequently, 'the external benefits include taking a position as the technological or idea leader, higher price realization from having a fresher product or service offering that customers find more desirable, and developing a position in the minds of customers as a reliable and responsive innovator' (Stalk G. , 1993, p. 15).

Incremental innovation is impelled by specific drivers, which in turn demand firms to develop or elaborate specific activities, capabilities, and resources. Therefore, first, differentiation and cost drivers of ICHS are briefly discussed, before second, core activities, capabilities and resources. Figure 9 provides an overview on ICHS generic concept, key activity drivers, activities, capabilities and resources.

DIFFERENTIATION DRIVERS AND ADVANTAGES

Both, incremental and radical innovations can generate high levels of incommensurability of which customers benefit through product uniqueness, distinctiveness, or non-exchangeability (Porter, 1980). By this, ICHS competitive objective is to create a temporary space of monopoly leading to inelastic customer demand and consequently higher prices (Bohn, 1993). "An (at least incremental) innovation strategy can achieve time and/or speed advantages (`economies of speed') by means of a short run monopoly and

shorter development times" (Proff, 2000, p. 545). Furthermore, incremental innovations allow sustaining that advantage through increasing barriers to imitation as competitors are only able to catch-up but never outpace. By being the first, incremental innovators can establish new market segments and have the chance to determine the new 'dominant design' or 'standard' in an industry. Additionally, the shorter development cycle allows firm's to frequently adapt products according to new technologies, high global competition, or changing customer demands (Birnbaum-More, 1993; Nijssen, Arbouw, & Commandeur, 1995; Wheelright & Clark, 1992). 'Fast innovators can experiment with their customers as they fine-tune their innovations. They can introduce a version that is their best guess and quickly adjust it to reflect consumers' reactions (Stalk G. , 1993). Thus, firms become technological or idea leaders allowing charging higher prices 'fresher' products or services more desired and perceived as more reliable and responsive by customers (Stalk G. , 1993). In this line of reasoning, incremental innovation fosters a product's or firm's reputation leading to customer loyalty and reducing the likelihood of customers switching to alternative offers from followers. Furthermore, marketing this reputation positively influences the demand curve of a firm's products by increasing sales volumes at a given price. To some extent, this demand will become "dedicated" as buyers come to view the firm's product as higher quality relative to those of competitors; that is, buyers will be willing to pay a premium price for the firm's brand. Marketing investments can also shape the price elasticity of demand for the firm's product, as the buyers' high quality product perception lessens his willingness to reduce the quantity demanded in response to an increase in price' (Lazonick, 2010, p. 328)

Furthermore, adopting new technologies quickly in new product development generates customer benefits through broadening a firm's product and service portfolio allowing coping with unsatisfied market opportunities (Wheelright & Clark, 1992). Frequently shifting customer demands further exacerbate the need for incremental innovation as it allows preempting the high number of lucrative market niches existing in many of today's industries (Kessler & Chakrabarti, 1996). Moreover, customers benefit from lower production and transaction opportunity cost resulting from faster applying new innovation leading to prolonged product life cycles before products become obsolete.

COST DRIVERS AND ADVANTAGES

Central for the concept of innovation driven cost reductions are *economies of speed* in combination with *economies of scope and quality* (Chandler, 1977; Ito & Rose, 2004). Theoretically, economies of

speed are incorporated in economies of scale 'because the economies of scale depend on both – rated capacity – and speed – the intensity of which the capacity is utilized' (Chandler, 1990, p. 24). In that line of reasoning, a firm's cost position is mainly determined by two factors: rated capacity and throughput as the actually processed amount during a certain period of time (Chandler, 1990). Thereby, rated capacity is linked to physical characteristics of the production facilities and determines the economies of scale and scope *potential*, while throughput is rather organizational and determines the actual economies of scale and scope *achieved* (Chandler, 1990, p. 24).

The product innovation cycle includes 'the time between the moment a new opportunity occurs and the moment when the first customers are satisfied' (Meffert, 1974; Szekely & Strebel, 2013); or more precisely is the time required from initially developing - including the conception and definition of an innovation - to the ultimate commercialization of introducing the new product into the marketplace (Kessler & Chakrabarti, 1996; Vesey, 1991; Mansfield R. , 1986).

Accordingly, two general cost types of innovation can be distinguished: first, cost of developing the new product and second, cost of the overall product life cycle of the new product. The cost of innovation consists of RD cost during the development cycle and production and transaction cost during the product life cycle. Keeping that in mind, economies of speed result from the two fundamental effects of *shortened development time* reducing development cycles and *fast availability and high frequency of innovation* reducing production and transaction based opportunity cost (Fleck, 1994). Consequently, positive cost effects result from speeding up the 'product innovation cycle' *and* prolonging the product life or 'sales' cycle (Sonnenberg, 1993; Patterson & Lightman, Accelerating innovation: improving the process of product development, 1993).

Starting with the product innovation or *product development cycle*, which is the time necessary from deciding on applying a new technology to starting mass production including "the time consumed to secure and install any new equipment needed, R&D of the process and product, and qualification of the manufacturing process and product for mass production" (Leachman & Ding, 2007, p. 46). Thus, time oriented economies of speed can affect two important aspects of new product development: first, the *point in time of completing the development* of the new product and second, the *length of time of the entire product life cycle* (Sommerlatte & Mollenhauer, 1992). Completing product development determines the point in time - the start of the so called 'strategic window' - from which the new product can be marketed.

Thereby, the strategic window represents the temporary fit between a market's customer demands and a firm's capabilities (Abell, 1978). Through delays in product development the period for marketing the innovation is irreversibly lost, which is for example indicated by the correlation of market entry and market shares (Simon H. , 1989). 'Every month the product launch slips takes a month away from the product's return window. (…) There is no way to recover that loss. The product has a finite period of opportunity, and if it misses a month in that period, revenue is essentially lost' (Patterson, 1998). This can significantly affect a product's profit prospects, which can sum up to almost one third of less profit, which is opportunity cost of time delay, over a five years period than if it were on time (Gupta, Brockhoff, & Weisenfeld, 1992). 'The cost of a delay at the stage of the innovation cycle is actually the cost of the lost opportunity in the sales cycle' (Sonnenberg, 1993). In consequence, innovators with shorter development cycles benefit from lower opportunity cost.

In general, innovation speed and product quality are positively correlated through increasing the degree of customer satisfaction (Clark & Fujimoto, 1991). Moreover, a relationship between economies of speed and economies of quality exists (Kessler & Chakrabarti, 1996). The cost effects are interrelated through learning, planning, technology and employee focus (Kessler & Chakrabarti, 1996). Starting with the first, accelerated product development speed creates the basis for learning among employees and for increasing RD capabilities through improved frequency and time-wise responsiveness on new product developments (Eisenhardt, 1989; Patterson & Lightman, 1993; Sonnenberg, 1993). Higher product development frequency driven by incremental innovation allows real-time market testing of new ideas or technologies as well as immediately correcting mistakes occurring after introducing the new product. 'By introducing more products, faster, an organization is sampling the marketplace more often and at a higher rate. Customer feedback facilitates rapid adjustments or modifications in the product offering, thereby leading to further improvements and growth in sales, and in some cases to entirely new products. This feedback, which is not available to competitors, represents quality information on which to base quality decisions which lead to quality products. The more rapidly the market can be sampled by new product introductions, the higher the quality of information upon which to base new products, and the more rapidly new products can be implemented, and so on' (Sonnenberg, 1993). Thus, short-cycled feedback loops are established generating higher potential for learning and knowledge accumulation (Meyer C. , 1993). In summary, learning is improved and knowledge faster accumulated by short-cycled feedback loops gener-

ated through enjoying more product innovations, getting more market and customer feedback and applying more new technologies in a shorter period of time (Stalk G. , 1993).

While learning also provides a proper basis for improved planning, incremental innovations further advances planning through requiring shorter periods of time for each development or product cycle to forecast. Thus, more 'accurate projections about competitors' movements, developments in component technologies, and customers' tastes and expectancies in shorter time periods' are possible (Kessler & Chakrabarti, 1996, p. 1178; Wheelright & Clark, 1992). Improved planning, in turn, allows for better targeting and satisfying market and customer demands (Deschamps & Nayak, 1995; Page, 1993). Next to this, faster product developments allow for more frequently incorporating new and advanced technologies increasing customer perceived, relative incommensurability in terms of being new or up-to-date (Cordero, 1991; Gomory, 1989). Last, development speed fosters 'greater focus and commitment among workers to project-specific goals', which typically increases quality of processes and products (Kessler & Chakrabarti, 1996; Clark, 1989) (e.g., Clark, 1989b; Flynn, 1993).

Furthermore, firm's applying incremental innovations are often participating in networks with for example research institutions (Dodgson, 1993; Schill, Bertodo, & McArthur, 1994). By this, firms can increase scale and scope effects through bundling volume across the overall scale of the network as well as utilizing joint institutions more heavily (Zaheer, Gulati, & Nohria, 2000; Vinding, 2006). Moreover, cost of for example running a preventive quality system can be shared and risks reduced (Teece D. , 1986). Further, networks improve the ability to deal with complexity, enhance learning, flexibility and efficiency, and increase speed in the innovation process (Vinding, 2006).

Additionally, through longer *sales cycles* based on shorter development periods innovators can increase their total production volumes, raise market shares, and charge premium prices after introducing the innovation (Smith & Reinertsen, 1992; Vesey, 1991; Meyer C. , 1993; Reiner, 1989). While the point in time of finishing product development determines the sales cycle and thus, a firm's consecutive revenue and cost position, the duration of the product development affects the cost of development. Costs in this period are influenced in two different ways: first, the change from a radical to an incremental innovation strategy and second, a compression of development activities (Fleck, 1994). While a change of innovation strategies is often enough for supporting HS, the second is providing the sufficient basis for combining several competitive advantages. Despite differing in absolute amount, the underlying effects of both

cost drivers are quite similar in terms of volume and reputation. Volume effects due to broader and faster changing product portfolios allow innovators increasing overall demand and/or decreasing competitors' demand. That also explains the preoccupation of firm's applying ICHS with successively lowering prices in order to further increase market share during the course of the product life cycle (Lazonick, 2010). This allows firms to extend their available market and thus lower unit costs through economies of scale. While the absolute amount of volume and thus, the actual capacity level a plant is operating is important, 'time required to reach a certain level can be as important as the capacity level itself' (Leachman & Ding, 2007, p. 52). In consequence, quickly achieving volume is crucial for ICHS as the higher initial investments need to be distributed on a high amount of throughput for driving down unit costs (Lazonick, 2010). Investments in incremental innovation are necessary for example for building up institutions balancing speed and quality during development or "increasing the capacity for production of a profitable product, accelerating the yield ramp, or reducing the average cycle time of such products" (Kessler & Chakrabarti, 1996; Leachman & Ding, 2007, p. 49). This volume driving effect is often also termed 'demand trigger effect', which typically coincides with a demand decreasing effect of competitive products based on the destructive potential of innovations making existing products obsolete (Starr, 1992; Cordero, 1991).

Moreover, innovators achieve production cost advantages through ceteris paribus gaining higher experience curve effects in developing and marketing products. Thus, positive cost effects from short product development depend on increased coordination, which is subsequently reducing costly work redundancies and failure corrections (Clark, 1989; Rosenau, 1988; Kessler & Chakrabarti, 1996; Meyer C. , 1993). In that line of reasoning, cost advantages result from earlier detecting failures and thus, reducing resource efforts otherwise wasted and granting time to implement contingency plans (Sonnenberg, 1993). This is similar to cost and risk reducing effects resulting from preventive quality systems avoiding correcting problems after they occurred late in the value chain. That way, cost effects result from preventive measures in RD, which increase product and process quality and thus, affect manufacturing and customer perceived quality (Fleck, 1994). In return, a cross-functional TQM system increases also the quality in RD indicating the complementary relationship of both. In that case, innovations affect both product and process quality. In sum, this mechanism lead to efficiency increases and cost decreases. Additionally, increasing development speed leaves a shorter period of time for person-hours spent and consequently less funds spent (Rosenthal, 1992; Kessler & Chakrabarti, 1996).

Furthermore, as it is in many industries hard to achieve capacity utilization rates justifying the required initial investments, ICHS firms frequently outsource non-specific input to external suppliers (Sturgeon, 2002). Thus, the innovative firm can focus its 'in-house capabilities to provide inputs that are specific to the products they manufacture' and simultaneously participate from economies of scale generated by external partners through aggregating demand for non-specific input (Sturgeon, 2002).

Also transaction costs are lower for innovators, as they can set the new standard in the market and hence, need to dedicate less effort in retaining customers than competitors need to invest preventing customers from switching to another product (Fleck, 1994). In dynamic markets with successively reduced sales cycles and continuously changed customer preferences, followers can hardly compensate time delays in product development and thus suffer from disadvantages. The pharmaceuticals and semiconductor industries are examples for industries heavily determined to 'time as a strategic success factor' (Simon H. , 1989; Leachman & Hodges, 1996). Furthermore, firms strongly focusing on innovative reputation can create customer goodwill and subsequently decreasing transaction cost through higher rates of repurchasing. Thus, "in situations where customers rely substantially on their knowledge of and past experience with a service provider's competence and reputation, when these customers attempt to assess the credibility and quality of a new service, a strong company resource fit can play a compelling and positive role" (Brentani, 2001, S. 178).

In addition, *economies of scope* result from utilizing quasi-public goods, indivisible physical goods and institutions. As already mentioned, incremental and radical innovations generate a similar degree of external incommensurability, while differ internally in respect to the degree of novelty required to produce this distinctiveness. However, especially the magnitude of internal change required determines the extent to which joint input factors for realizing economies of scope can be utilized. This pinpoints to the significant economies of scope potential offered by incremental compared to radical innovations. In that respect, ICHS and VCHS differ only gradually with both allowing generating similar scope effects from jointly utilizing quasi-public goods, indivisible capital goods and institutions. Information or manufacturing technology such as computer integrated manufacturing (CIM) are examples of indivisible goods constituting the basis for economies of scope. That way, a CIM system "replaces the fixed, physical integration mechanisms such as conveyors and transfer machines with the easy to change intelligent systems that

achieve integration using information systems and technology" (Goldhar & Lei, 1995, p. 75). "In effect, economy of scope made possible by CIM technology ‚repeals' the traditional volume versus variety, cost and quality relationship, and thereby solves the innovation versus productivity paradox" (Goldhar, Jelinek, & Schlie, 1991, p. 248). The result is higher firm performance through innovations (Kleinschmidt & Cooper, 1991). Finally, ICHS ability to generate superior revenues and profits provides the basis for self-financing the higher capital requirements of incremental innovations (Lazonick, 2010). These funds are then available for example for new investments in learning and knowledge in product development, machinery in manufacturing or incentives for employees applying their skills (Lazonick, 2010).

However, innovation leads also to higher operational costs, increased capital requirements and risks. While speed and quality are positively related, balancing both requires active management as otherwise the one will compromise the other (Sonnenberg, 1993). In that sense, *higher cost* or 'hidden cost' of speed can arise from 'more mistakes, heavy usage of resources, and disruptions in workflow' (Kessler & Chakrabarti, 1996, p. 1150; Crawford, 1992). Moreover, uncontrolled and unfocused innovation speed can lead to reduce performance specifications (Carmel, 1995; Smith & Reinertsen, 1992). Thus, formal techniques such as quality function deployment are required for focusing innovations on customer demand. In consequence, adding the necessary qualitative focus to incremental innovations will raise cost of innovations through efforts required for implementing and operating for example a preventive quality management system.

Increased capital requirements result mainly from the cumulative innovation process until it generates financial returns (Lazonick, 2010). This capital is required to initiate a 'virtuous circle' of accumulating learning and knowledge over time on innovation, which in turn increases a firm's innovation capability and thus increases learning. As this initiation on self-enforcement of learning and knowledge takes time, this capital is often termed 'patient' capital (Lazonick, 2010).

Higher risks are due to the risk of innovation failure and higher transaction cost through faster processes and new products increasing management complexity. Also investments in RD, manufacturing, marketing and management are necessary determining a high capital intensity of ICHS firms, thus increasing a firm's level of sunk cost (Chandler, 1992). Risks increase due to the uncertain nature of investments required for applying an incremental innovation strategy (Lazonick, 2010). Types of risks associated with VCHS are technological, market, and competitive. Technological risks result from a

firm's uncertainty to evaluate its capability to develop and implement the higher quality processes and products required by the innovation (Lazonick, 2010). In this line of reasoning, market risks evolve from uncertainty of for example a product's future price and cost development, market share gains or production scales (Lazonick, 2010). While a firm can mitigate the first two risks through for example measures improving learning and knowledge accumulation, the last is inevitable as it includes competitor actions such as investing similarly in innovation but achieving lower levels of product quality at higher cost (Lazonick, 2010).

Furthermore, speeding up innovation requires several changes in a firm's strategic orientations, structures and capabilities and increases a firm's complexity (Kessler & Chakrabarti, 1996). As already mentioned above, incremental innovation requires both an orientation towards speed and quality. Consequently, a firm's orientation towards speed, its objectives and its means to achieve it need to be aligned (Kessler & Chakrabarti, 1996). In response to this alignment, organizational capabilities, staff and structures necessary for speeding-up need to be developed. Such fundamental adaptations add complexity to a firm's management as new orientations, structures and capabilities need to be built up and implemented. Otherwise, doing the same things as today, but faster, will lead to burning out machinery and workers (Dumaine, 1989, p. 55). "In the capital intensive industries the throughput needed to maintain minimum efficient scale required careful coordination not only of the flow through the process of production but also the flows of inputs from suppliers and the flow of outputs through intermediaries to final users. Such attention did not, indeed could not, happen automatically. It demanded the constant attention of a managerial team or hierarchy" (Chandler, 1990, p. 24).

C.3.2.2. DETERMINING AN ICHS CORE ACTIVITIES, CAPABILITIES AND RESOURCES

Central for incremental innovation and thus ICHS, is speed of product development determining both development *and* product life cycle (Sommerlatte & Mollenhauer, 1992; Smith & Reinertsen, 1992; Vesey, 1991; Meyer C. , 1993; Reiner, 1989). Thus, firm's applying ICHS need to be strong and fast in product development.

Despite being rather non-discrete and non-sequential in nature, the innovation process' activities fall in two broad categories: pre-development and development (Kanter, 1988; Meyers & Marquis, 1969; Quinn, 1988). *Predevelopment activities* such as organizational policies or strategic orientations direct development activities towards increased innovation speed through achieving higher employee motivation and

commitment on innovation objectives and limiting the amount of information required for directing development activities (Bower, 1970; Quinn, 1988; Dutton & Duncan, 1987; Kessler & Chakrabarti, 1996). “Even before the product innovation cycle begins, research is performed to help create new product opportunities. The objective of research is to speed the moment of product opportunity. This has maximum value when it is rapidly expedited by the corporation, which is most likely to happen when research is clearly aligned with corporate strategy. The infrastructure of the corporation is then capable of quickly recognizing, assessing and implementing the opportunity, thereby shortening the entire innovation process, beginning with the first phases through to production implementation” (Sonnenberg, 1993, p. 20). Consequently, strategic orientations can be further disaggregated in ‘criteria setting’ and ‘scope setting’ (Kessler & Chakrabarti, 1996). Setting criteria for reducing development time includes ‘establishing a specific time goal, nurturing a supportive culture for speed, and adopting a speed-emphasizing reward system’ and thus, providing orientation ‘for "fuzzy" front-end development activity to focus people and motivate their timely development of the innovation’ (Kessler & Chakrabarti, 1996, p. 1153). Setting the scope for development activities, on the other hand, is focusing on reducing the ‘uncertainty and complexity of otherwise fuzzy initiation tasks and thus is determining for example the degree of orienting towards incremental or radical innovation (Kessler & Chakrabarti, 1996, p. 1153).

In contrast, *development activities* focus on accelerating actual innovation activities for increasing responsiveness and flexibility through for example distinctive activities and capabilities in management, coordination, information processing, communication and learning (Lawrence & Dyer, 1983; Prahalad & Hamel, 1990). Management activities and capabilities mainly aim at eliminating bureaucratic restrictions. Thus speeding up innovation development can be further differentiated in overall management attention and commitment as well as innovation emphasizing staff and structures ((Spender & Kessler, 1995). In academic literature, frequently management involvement and commitment through providing direction and priorities is related positively to innovation speed (Cooper & Kleinschmidt, 1987; Mabert, Muth, & Schmenner, 1992; Page, 1993). Or put differently, “unless top management is truly interested in faster product development - and it shows - little can be done by lower-level managers and workers to speed up product development” (Smith & Reinertsen, 1992, p. 241). That way, top management can speed up innovation development through measures of providing appropriate physical, financial or human resources, putting management attention on innovation (projects), making timely decisions and supporting overcoming organizational resistance, stimulating communication within development teams and facilitating

cross-functional coordination, or encouraging employees through innovation based incentives (Chakrabarti, 1974; Chakrabarti & Hauschild, 1989; Rosenau, 1988; Gupta & Wilemon, 1991; Smith & Reinertsen, 1992; Brown & Eisenhardt, 1995).

In addition, the role of decision-makers is essential for realizing innovation by allocating firm resources to cope with technological, market or competitive uncertainties in generating innovations (Lazonick, 2010). Thus, ICHS management needs to be capable of appraising a firm's current innovative capabilities and determine, if necessary, required strategic investments in new, typically complementary capabilities (Lazonick, 2010, p. 331).

Furthermore, strongly emphasizing the role of the project leader as well as of cross-functional teams can facilitate speed. Typically, 'it takes very special individuals to guide new products to market with speed and certainty' comprising roles such as product champions, strong project leads, experienced project team members and representatives of internal and external interest groups involved in project teams (Donovan, 1994; Kessler & Chakrabarti, 1996). Especially committed and persistent product champions willing to sacrifice position or prestige for speeding innovation development are essential (King & Penlesky, 1992; Towner, 1994; Maidique, 1980). Strong project leads also play a key role in successfully accelerating innovation through coordinating and supporting teams and team members (Farris, 1982; Jain & Triandis, 1990). Furthermore, they facilitate communication, gather and apply information from internal and external sources for development activities, provide knowledge on technologies, customers and markets, and serve as project coordinator and decision maker (Allen, Lee, & Tushman, 1980; Cohen & Levinthal, 1990). Thus, ICHS posses strong capabilities in project management.

Besides this, team experience is a key to accelerate innovation. Team experience can be achieved on two different levels: collective team experience and experience of the individual team member. While individuals provide most up-to-date capabilities, the team supplies knowledge on for example specialist technology or marketing topics comprising all functions necessary for new product development (Gomory, 1989; Smith & Reinertsen, 1992). Last, the team needs to represent the relevant interest groups both internal and external to the firm. This typically requires a strong capability to integrate demands from such diverse groups as internal departments and external stakeholders in the project team (Shrivastava & Souder, 1987). By this, external fit – meaning meeting customer needs through the new product's specification – and internal fit – referring to aligning the capabilities of internal functions and external partners is achieved (Cooper R. G., 1986; Zirger & Maidique, 1990; Souder & Chakrabarti, 1978). However, inte-

grating and managing external manufacturing partners is also essential in the sales cycle as each innovative firm in many industries cannot achieve capacity utilization levels justifying the required initial investments (Sturgeon, 2002). Thus, firm's externalizing production capacity of product unspecific input need to manage these suppliers on the one hand and develop 'in-house capabilities to provide inputs that are specific to the products they manufacture' on the other hand (Sturgeon, 2002, S. 470).

Moreover, involving customers in product development can reduce development time and improve fit of product specifications (Cooper R. G., 1986; Cooper & Kleinschmidt, 1987; Meyer C. , 1993). Thereby, a close relationship with customers allows a kind of co-development through including the requirements early in the development process. Even if customers are not participating in product development, valuable feedback is returned quicker from the market, as products are faster served to customers (Rosenthal, 1992). Additionally, close customer relationship fosters employee motivation and attention to new ideas (Van de Ven, 1986). By this, similarly to economies of quality, the 'voice of the customer' is incorporated earlier in the development process leading to reducing or eliminating certain development steps such as market research and thus shortening overall development time (Karagozoglu & Brown, 1993; Smith & Reinertsen, 1992). On top of that, involving customers allows generating better understanding of customer and market needs and providing a better planning basis reducing efforts for reanalysis and redevelopment (Kessler & Chakrabarti, 1996).

Besides this, structural activities and capabilities focus on reducing or completely eliminating tasks (Crawford, 1992; Kessler & Chakrabarti, 1996). This can be achieved by processing development tasks in overlap or in parallel rather than in sequential or linear order (Hall J. A., 1991; Page, 1993; Rosenau, 1988; Millson, Raj, & Wiiemon, 1992). Thus, higher coordination and collaboration is required in product design and development (Brown & Karagozoglu, 1993; Smith & Reinertsen, 1992; Souder & Chakrabarti, 1978). This way, concurrent engineering is one of the most effective facilitators of speed and quality in product development as it allows systematically integrating design of products and related processes and thus causes developers from the very beginning to consider all elements of the product life cycle from conception to disposal (Sonnenberg, 1993; Handfield, 1994).

Additionally, ICHS are strong in organizing the development process with a focus on planning, time evaluation and technology appliance (Kessler & Chakrabarti, 1996). Focus on planning provides coordination of product development tasks directed towards time and quality objectives (Smith & Reinertsen, 1992). Furthermore, planning consisting of frequent and consecutive milestones motivates team members

and generating a sense of urgency (Peters T. , 1987; Tabrizi & Eisenhardt, 1993; Gersick, 1988). Additionally, firms applying ICHS evaluate development tasks in terms of their total time effect, which leads to curtailing most, but not all development activities. In consequence, it can be even beneficial to extend certain activities in order to reduce the overall time consumed for product development. For that reason, 'preventive speed accelerating tasks' such as testing can be extended for reducing development time required for correcting deficiencies detected otherwise with a time delay (Wheelright & Clark, 1992; Gupta & Wilemon, 1991). This corresponds to findings identifying a cumulative effect of speed advantages along the development and sales cycle (Stalk G. , 1993). "Even more interesting was where the Japanese company achieved its speed advantage. It did not score a significant advantage in any one step of the cycle - design concept, design engineering, design review, detail design, field test, prototype manufacture, or first production. Instead, with the exception of the design review step, the Japanese company outperformed its Western affiliate a half-step every step of the way. Cumulatively, the advantage becomes significant" (Stalk G. , 1993, p. 15). In consequence, the structure of firms applying ICHS is characterized - similarly to fast-response factories – by physically close to manufacturing located, autonomously steered, with decentralized decision power equipped, cross-functionally integrated development units rapidly moving through each of the development activities (Stalk G. , 1993; Kessler & Chakrabarti, 1996). From all that mentioned, decentralized decision making is of special importance as it has the potential to increase employee involvement and commitment, absorb excessive outside disturbance, decrease frequent redirections, and limit the number of bureaucratic approvals (Damanpour, 1991; Ancona & Caldwell, 1990; Stalk & Hout, 1990; Emmanuelides, 1991; King & Penlesky, 1992). The potential speed advantage can be substantial as indicated for example by previous research, finding up to 90% of time spent for introducing a new product is consumed by administrative tasks, which can be to some degree reduced by decentralized decision making (Dumaine, 1989). On firm level, ICHS are characterized by flat hierarchy structures enabling employee rotation across different functions and divisions (Meyer C. , 1993; Lazonick, 2010).

In addition, the ICHS firms need to be capable of 'transforming finance into innovation' requiring 'the allocation of funds to sustain the cumulative innovation process until it generates financial returns' (Lazonick, 2010, p. 331) . Corresponding to this, innovative firms are obliged to attract external capital necessary for financing the innovation or obtaining sufficient gains from innovations available for self-

financing. Thus, ICHS require access to external sources of funds such as stock markets, banks, or private equity as long as the firm's self-financing power is not sufficiently providing capital (Lazonick, 2010).

However, the transformation of finance into innovation requires the intermediate step of developing the productive resources required for innovation. This is a crucial part of management's role and requires to assess and sustain the necessary "quality and quantity of productive resources in which the firm must invest to develop higher quality processes and products than those previously available or that may be developed by competitors" (Lazonick, 2010).

Technology is central for vital ICHS in two ways. First and already explained above, it determines the degree of external dynamics and thus speed required in product development. Second, it enables speed through ICT. One technology accelerator is for example computer-aided design allowing automating complex computational and drafting procedures or speeding up information about specifications and design parameters (Cordero, 1991; Smith & Reinertsen, 1992; Tabrizi & Eisenhardt, 1993). Both can reduce design and engineering efforts shortening upstream and successive downstream activities (Karagozoglu & Brown, 1993; Mabert, Muth, & Schmenner, 1992; Millson, Raj, & Wiiemon, 1992). Moreover, computers, computational methods, user-friendly software and large electronic databases provide the ability to investigate an unprecedented number of designs with improved accuracy and speed (Sonnenberg, 1993). Typical examples are the use of statistical design and analysis minimizing experiments and maximizing information or computer modeling and simulation (Sonnenberg, 1993). Additionally, ICT can drive the quality and quantity of information shared in cross-functional development teams reducing development time, even if it cannot substitute close location of project team members for successfully developing innovations (Keller, 1986; Zirger & Hartley, 1993). Furthermore, technology provides the basis for speed oriented target setting and measurement.

Over and above, product design defined during new product development determines *post-development activities*. Indeed, product design strongly affects manufacturing design or put differently, ignoring manufacturing design as a product parameter in product development can decrease speed and efficient manufacturing (Kessler & Chakrabarti, 1996, p. 1174). Thus, design parameters such as few parts or reusable standard components and modules influencing manufacturing speed need to be considered during product development already (Ali, Krapfel, & Labahn, 1995; Carmel, 1995; Meyer C. , 1993). Otherwise, speedy

product development circumvents fast and efficient manufacturing by requiring late and frequent product changes or unplanned restrictions in production probably leading to redundancy and recycling of work (Clark & Fujimoto, 1991; Millson, Raj, & Wiiemon, 1992; Wheelright & Clark, 1992; Vesey, 1991). Therefore, ICHS firms hear the 'voice of manufacturing' early in the development and emphasise the need for cross-functional development teams (Dean & Susman, 1989; Hall J. A., 1991).

Furthermore, for improving speed ICHS firms apply flexible manufacturing technologies positively affecting lot size, layout, and scheduling for combining variety and productivity with shorter response time (Stalk G. , 1993). Thereby, flexible manufacturing techniques reduce minimum efficient lot sizes and allow more frequently updating products and faster matching customers demands (Stalk G. , 1993). Layout is affected by flexible manufacturing through product focused organizational structures bringing "manufacturing functions for components or products as close together as possible to minimize the handling and moving of parts. A part moves from one activity to the next with no, or very short delays" (Stalk G. , 1993, p. 15). Last, local scheduling applied in product-oriented flexible manufacturing allows speeding up production processes by for example eliminating intermediate scheduling steps (Stalk G. , 1993). Altogether, vital ICHS exhibit characteristics from flexible manufacturing in order to achieve speed improvements and efficiency gains.

Furthermore, vital ICHS need to cope with a constant flow of product introductions on the one hand and its corresponding flow of information on the other hand. The first requires investments of a considerable amount and duration in distinctive MS capabilities and resources such as sales force, distribution and service facilities, advertising, and branding for informing and convincing potential buyers of the new product's quality superiority (Lazonick, 2010, p. 328). Keeping this in mind, ICHS can apply distinct marketing techniques tailored to fast innovation cycles such as to experimentally market new products before broadly introducing products and services (Stalk G. , 1993). Thus, ICHS utilize short development and introduction lead times for quickly adapting to changing customer needs and 'gambling' on new technologies or ideas without running risk of producing major 'failures' (Stalk G. , 1993).

One key outflow of these fast paced product introductions is 'quality information on which to base quality decisions which lead to quality products. The more rapidly the market can be sampled by new product introductions, the higher the quality of information upon which to base new products, and the more rapidly new products can be implemented, and so on. These links result in a growing productivity cycle.' (Sonnenberg, 1993).

ICHS main strategic orientation is represented by a strong emphasis on speed (Sonnenberg, 1993; Kessler & Chakrabarti, 1996). Such a long-term orientation on speed including for example a distinct willingness to invest extra resources for reducing development and introduction time (Mansfield E. , 1988). In consequence, ICHS need to align the overall strategy and strategically derived decisions consistently on speed (Kessler & Chakrabarti, 1996). This can be done in several ways including the emphasis placed on speed relative to other strategic goals, a firm's incentive system as well as the firm's culture (Kessler & Chakrabarti, 1996, p. 1160). As the first two aspects are covered in the previous chapters already, the following will elaborate on the cultural characteristics.

First, the *culture* of vital ICHS is required to be receptive for enabling collaboration and reducing resistance to external ideas or externally generated technologies (Kessler & Chakrabarti, 1996). This is essential as a network of firms can much faster introduce innovations then firms individually. The personal computer industry is such an example applying external sources of innovations such as operating or application software allowing computer manufacturers to assure a constant stream of innovations (Kessler & Chakrabarti, 1996). While, however, applying external sources is sufficient for faster product development, it is not enough for ICHS as only combining internal and external innovation sources provides the basis for increased learning and know how development allowing recogjnizing, assimilating, and applying external knowledge (Cohen & Levinthal, 1990). 'Thus, greater use of externally sourced ideas and technologies would speed development only if they are used to supplement but not substitute for internal learning' (Kessler & Chakrabarti, 1996, p. 1166). However, for exploiting external knowledge as extensive as possible, firms need to have in-house scientific capabilities (Gambardella, 1992, p. 394). In that line of reasoning, information and communication can only enhance the absorptive capacity of firms by easing external knowledge transmission and integration (Tripsas, 1997; Vinding, 2006).

Moreover, as it is more expensive to produce than to transmit knowledge, innovative firms have a strong incentive to cooperate in order to achieve 'higher R&D investment, better diffusion of results, elimination of wasteful duplication of efforts and access to new markets' (Vinding, 2006, p. 507; D´Aspremont & Jacquemin, 1988). Thus, the innovation process can be seen as feedback loops strongly entangling knowledge-producing and knowledge-using agents within and across a network of firms and users (Vinding, 2006; DeBresson & Amese, 1991; Von Hippel, 1988). Thus, the culture needs to prevent a 'not-invented-here syndrome', standing for R&D department's self-perception to possess a knowledge

monopoly and potentially limiting the absorptive capacity of a firm (Burkart, 1994; Gomory, 1989; Jain & Triandis, 1990). Rather, firms applying ICHS seek partners of complementary, cutting edge knowledge of changing technologies (Meyer C. , 1993).

Second, ICHS firm culture is oriented towards project-related goals emphasizing clear and specific time-based objectives (Kessler & Chakrabarti, 1996, p. 1162). Thus, unambiguously defining and quantifying time-based objectives for new product development projects focuses managers and employees attention on speed (March & Simon, 1958; Takeuchi & Nonaka, 1986; Thamhain & Wilemon, 1987). Similarly, product concepts need to be clear and specific avoiding later corrections in the stages of design, marketing, and production (Cooper & Kleinschmidt, 1987; Thamhain & Wilemon, 1987). Figure 9 provides an overview on ICHS underlying activities, capabilities and resources.

FIGURE 9: OVERVIEW ICHS

	Underlying concept	Activity drivers	Activity system and activities	Core resources and capabilities
Differentiation adv.	1. Continually refine and adapt products perceived by customers as fresher and more reliable and responsive to their needs	- Incommensur-ability - Customer loyalty	I.1. Firm infrastructure (n=6) - Separate the value chain according to product specifc or indifferent inputs - Decompose and reconstruct a firm's internal system and external value chain - Create flat hiearchy structures with autonomously steered, with decentralized decision power equipped, cross-functionally integrated development units - Cross-functional team collaboration - Locate development teams physically close to manufacturing - Establish network of external partners providing complementary competencies or customer-neutral, standard components I.2. HR management (n=3) - Support knowledge and information exchange - Rotate employees across different functions and divisions - Align employees on incremental innovation by for example emphasizing specific roles such as product champions I.3. Technology (n=2) - Apply computer integrated manufacturing - Apply ICT for achieving speed and integration along value chain I.4. Purchasing (n=1) - Apply selective outsourcing of customer neutral, standard components II.1. Research and Development(n=8) - Focus on speed of development process and customer perceived quality - Organize development process with a focus on planning, time evaluation and technology appliance - Focus on continual improvement of product design - Include manufacturing early in product development - Apply customer information in product development - Apply ICT for speeding up product development - Apply preventive speed for increasing overall speed of product introductions - Prototype rapidly II.2. Inbound logistics (n=0) II.3. Operations (n=5) - Focus on flexible manufacturing minimizing lot size, allowing producible layout, and improved scheduling - Continually improve processes - Integrate product development and production through deploying customer information on detailed level of manufacturing operations - Invest long-term in advanced manufacturing and ICT II.4. Outbound logistics II.5. Marketing and sales (n=9) - Establish close customer relationship through identifying new customer needs not yet satisfied - Gain fast feedback from customers through real time market research - Experimentally market new products for generating fast customer feedback - Capture and disseminate information from fast paced product introductions as basis for quality decisions on new products - Continually measure, analyse, and exchange knowledge on customers - Apply competitor information for identifying opportunities for incommensurability - Research focus on future market opportunities in mass markets - Focus on new technologies and technological changes - Apply marketing techniques tailored to fast innovation cycles II.6 Service - Service used for information collection	Operational resources (n=1) and capabilities (n=10) - Sufficient and long-term investment for sustaining the cumulative innovation process until financial returns - Capability to implement and operate ICT for integrating value chain - ICT capability to process high amount of information - Capability to operate a computer integrated manufacturing system - Experimental product development capabilities - Organizational and individual learning based on customer relationship and external knowledge exploitation - Capability to sense and respond to market opportunities - Marketing and sales capability for accessing customers quickly and convincingly - Capability to quickly transform new technologies in products and processes - Capability to recognize, assimilate and apply external knowledge - Combining internal and external sources of innovation for increased learning and know how development Management capabilities (n=10) - Capability to identify component or capability supplements - Capability to balance external and internal innovation through incremental innovation - Knowledge management capability to combine in-house scientific knowledge with external knowledge - Capability to collaborate with external partners providing complementary, cutting edge knowledge on changing technologies - Capability to adopt new technologies and adapt to technological changes - Distinct capabilities in identifying technological, market or competitive uncertainties in generating innovations and allocate resources accordingly - Capability to involve employees and to direct attention and commitment to speed - Planning capability - Provide time-based, project oriented objectives - Capability to build lasting, learning customer relationship based on idea and technology leadership Company culture - Culture of full commitment to speed and quality - Culture to establish internal cooperation - Culture fostering communication, knowledge exchange and learning - Culture fostering customer and employee orientation, and change - Culture enabling collaboration and reducing resistance to external ideas or technologies - Long-term orientation on incremental innovation and speed - Culture focusing external knowledge and information - Orientation towards mass markets
Cost advantage	2. Lower customer cost through applying innovations faster and thus prolonging product life cycle	- Production cost - Transaction cost		
	3. Through incremental innovation shortened development time affects the point in time of completing the development of new products	- Speed - Quality		
	4. Longer sales cycles based on shorter development periods increase production volumes, raise market shares, and allow charging premium prices	- Scale - Reduced opportunity cost		
	5. Faster achieving volume allows coping with initial investments by increasing throughput driving down unit costs	- Speed - Scale		
	6. Earlier detecting failures in the production process and reducing resource efforts otherwise wasted and granting time to implement contingency plans	- Speed - Quality		
	7. Focus its 'in-house capabilities to provide inputs that are specific to the products they manufacture' and simultaneously participate from economies of scale generated by external partners	- Substiution		
	8. Highly utilizing quasi-public goods, indivisible physical goods and institutions necessary for fast development and production	- Scope		

D. SYNTHESIS OF HS TYPES

This research is concerned with identifying consistent HS concepts and discovering the underlying mechanisms necessary to implement and operate them. Fulfilling that task requires a combination of two things: first, theoretically deriving a 'synthesized' model comprising the variety of all different HS types and second, evaluating this model based on empirically collected data from firms applying HS successfully.

This chapter addresses the first task through developing a synthesized model of HS commonalities. In general, HS types show similarities of two different kinds: first, commonalities consistent across principle mechanisms and their specific operationalisation and commonalities in principle mechanisms. In each case, cross-type similarities represent common characteristics and can be interpreted as basic or generic mechanisms of HS such as for example the decomposition and reconstruction of the value chain or the intensive application of ICT. In contrast, type-specific differences signify differences in operationalising a specific HS type such as activities or capabilities in modular product design or delayed assembly of customer specific components. The differentiation between common and specific HS conceptual characteristics and mechanisms is meaningful for several reasons. First, it reveals the degree HS types vary in respect to their concepts and underlying mechanisms. Second, it provides valuable insights in commonalities of HS types allowing identifying the core conceptual components and underlying mechanisms. Third, it acts as a reference point or standard for comparing empirically detected drivers, activities, capabilities and resources. Thus, the model provides the basis for bottom-up reconciling qualitative data through deriving the main HS orientation on activity, capability and resource level. That way, the model acts as a 'HS map' comprising the full scope of activities, capabilities and resources used for comparing with aggregated empirically collected, detailed activities, capabilities and resources. Finally, the synthesized model allows identifying specific HS types by determining each types' unique characteristics.

Analogous to the description of each HS type the structure for developing the synthesized HS model starts with determining commonalities in concepts and activity drivers, followed by discussing common differentiation and cost drivers and ends with synthesizing common activities, capabilities and resources. In the following, the focus is on *common* rather than specific characteristics as the last can be determined by comparing the 'synthesized' with each individual type. Thus, the 'synthesized' model is complemented by type specific characteristics for determining a firm's HS orientation.

Before starting the ‘synthesis, it is worth clarifying that compared to the above, from previous theory deduced or constructed, specific HS types the synthesized model is a generic derivative from individual types representing scientific advancement. Thus, no research exists underpinning this synthesis. Moreover, sources referenced during explaining specific HS types are not repeated for corroborating the synthesized model. Altogether, this leads to only selectively applying references in the following subchapters.

D.1. SYNTHESIS OF COMPETITIVE EFFECTS AND ACTIVITY DRIVERS

D.1.1. SYNTHESIS OF DIFFERENTIATION CONCEPT AND DRIVERS

Comparing the concepts and drivers of different HS types reveal one common characteristic: extensive focus on *customer satisfaction*. In this line of reasoning, HS can also be termed as ‘benefit strategies’, ‘value strategies’ or ‘customer value strategies’ as they create customer value by *meeting customer demands* through fulfilling variety, individualization, quality and innovation needs (Chrisman, Hofer, & Boulton, 1988; Kordupleski, Rust, & Zahorik, 1994; Woodruff, 1997). SQHS, for example, generate customer value through offering a broad portfolio of product variants through combining components within modular product architectures for matching heterogeneous customer preferences. VCHS, in contrast, further extends this variety thinking by customizing certain product functions to individual customer needs. Similarly, QCHS fulfils customer needs in terms of reliability allowing reducing customer uncertainty and risks of operating the product. ICHS is contrasting with the other three types of HS as its orientation towards incommensurability tries to create something incomparable and thus creating new customer needs.

Moreover, all types of HS have in common – although differing on operational level – to *integrate customers* for achieving customer satisfaction. While SQHS integrate customers through allowing modular adaptations, VCHS involves customers in co-designing certain aesthetic or measurement characteristics. Above that, QCHS and ICHS are more forward oriented meaning that QCHS intends to understand customer’s current *and* future consumption purposes and ICHS aims at anticipating future customer needs or opportunities not yet discovered. Overall, customer integration provides the basis for immediate customer feedback often based on for example experimentally marketing products.

However, satisfying customers through meeting customer demands and integrating them is only one side of the coin, the other is the cost of the product or more precisely *total customer cost* including acquisition and operating cost over the product’s complete life cycle. Thus, another commonly shared feature

of HS is reduced customer opportunity cost. Lower customer opportunity cost result from fewer production and transaction cost, and lower cost of capital through reduced investment needs for the customer. While this driver is commonly shared, each HS type, however, shows differences in detail. For example, SQHS apply mix, changeover and modification flexibility for lowering transaction cost and investment needs through substituting only parts or components of the product. This allows avoiding premature product obsolescence and reduces opportunity cost of searching and acquiring new products. In addition, this result in lower production cost through higher volumes produced over for example a assembly line's overall lifecycle. Further, more efficient and effective technologies incorporated through upgrading modular product architectures allows reducing production cost. Above that, modular architectures reduce investment requirements and decreases cost of capital. In contrast, while VCHS customized products or services lower customer opportunity cost of transactions through avoiding after-sales adaptations, QCHS high quality products lower opportunity cost of production through less failures or downturns and thus, lower transaction opportunity cost through prolonged operation periods leading to less frequent product repurchases. Furthermore, prolonged product lifecycles allocate higher initial investments on a longer operating time leading to lowering annual average investments and cost of capital. Contrary to other HS, ICHS focus on new customer demands allowing decreasing opportunity cost of production and transaction as well as investment requirements and cost of capital. Faster providing innovations to customers allow them to lowering production opportunity cost through new, more efficient or more effective applications. Furthermore, transaction cost of customers are reduced by reducing the sales cycle and early introducing new innovations, which customers can utilize for a longer period of time till obsolescence and thus reduce average investment requirements and cost of capital.

In total, customers of HS firms value perceived variety, individuality, reliability or innovativeness, total product life cycle cost *and* customer integration. Thus, firms applying HS are characterized by generating 'high value' for their customers in terms of differentiation and low cost. Figure 10 provides an overview on 'synthetic' differentiation drivers.

Figure 10: Overview synthezised differentiation effects and drivers

Effect	Common drivers	Specific operationalisation of common drivers			
		SQHS	VCHS	QCHS	ICHS
Customer satisfaction	Customer demands	Combine product components for matching heterogeneous customer preferences	Customize certain product functions to individual customer needs	Provide reliable products complying with customer specification	Create new customer needs through incommensurable product
	Customer integration	Customer specific, modular adaptations	Customer co-design of product functions and characteristics	Comply with customer confirmation level and expectations	Anticipate customer needs or opportunities not yet discovered by other competitors
	Total customer cost	Flexibility leads to - Lower production opportunity cost through applying new, more efficient and / or effective technologies - Lower transaction opportunity cost by avoiding complete product obsolescence and lower repurchase frequency - Lower investment needs through substituting only some product components	Customizations lead to - Lower customer opportunity cost of transactions through avoiding after-sales adaptation efforts	High quality and reliability lead to - Lower opportunity cost of production through less failures / downturns - Lower transaction opportunity cost through prolonged product life cycle reducing repurchase frequency - Lower average investment and cost of capital through allocation over prolonged product life cycle	Fast, frequent innovations lead to - Lower production opportunity cost through applying new, more efficient and / or effective technologies - Lower transaction cost through longer utilization periods - Lower average investment needs and cost of capital through longer product life cycle

D.1.2. Synthesis of cost effects and drivers

In general, comparing cost advantages and drivers of HS types reveals direct and indirect cost effects. While direct cost effects vary according to their sources of either economies or learning for each of the HS types, indirect cost effects mainly represent economies of scale and scope.

In general, *indirect cost effects* are driven by differentiation induced volume increases. This affects both economies of scale and economies of scope. However, while scale economies are independent of the HS type, economies of scope vary across the HS types subject to the underlying differentiation mechanism. For example, SQHS customer perceived flexibility is generated through utilizing modular structures. That way, modular components represent a 'quasi-public good', which when repeatedly utilized reduces the cost of each consecutive transaction. In that line of argument, quasi-public goods are for VCHS 'sticky customer' information, for QCHS preventive quality institutions and for ICHS, speed and quality institutions. In general, however, all HS types share the dependence of utilizing 'quasi-public goods' – although different ones – for achieving positive, indirect cost effects.

While indirect effects are necessary for driving down cost, they are not sufficient for realizing HS, as otherwise purely focusing on differentiation would be enough. Quite the contrary, for combining differentiation and cost advantages an underlying consistent concept is required for generating positive differentiation and differentiation induced indirect cost effects as well as *direct cost economies*. Such a concept is for SQHS modularity, for VCHS mass customization, for QCHS quality function deployment, and for ICHS incremental innovation. Accordingly, direct cost effects vary with the underlying HS concept and comprise economies of substitution for SQHS, economies of integration for VCHS, economies of quality for QFD, and economies of speed for incremental innovation. Figure 11 provides an overview on these concept specific as well as common, indirect cost reductions.

Figure 11: Overview synthezised cost decreasing effects and drivers

Effect	Common drivers	Specific operationalisation of common drivers			
		SQHS	VCHS	QCHS	ICHS
Direct cost reductions		*E.o. substitution* through reusing modular product / organization components leading to - Lower set-up cost through component continuation - Increase component production volumes and economies of scale - Buy standard product components from suppliers utilizing external scale economies - Reduce product development time - Less inventory and assembly cost through delayed differentiation - Improve learning through knowledge reuse, transfer and combination - Lower transaction cost through embedded coordination substituting management capacity - Reduced change efforts in case of organizational adaptations - Increased reactivelearning and knowledge on customer demands through product combinations	*E.o. integration* through direct interaction between customer and supplier leading to - Lower development and marketing cost through integrating the customer in product specification and manufacturing - Less cost for acquiring, transferring and using customer information through direct interaction - Reduced set-up and change-over cost in operations through better demand planning - Lower cost for serving and sustaining existing or acquiring new customers through learning on customer needs - Lower cost of inventory, planning, capacity utilization, stability and sales through decoupling the value chain in order specific and neutral parts - Increased reactive learning and knowledge on individual customer demands for certain product functions through product adaptations	*E.o. quality* through product conformity to customer specifications leading to - Higher productivity through avoiding preventable double effort for delayed failure corrections - Lower scrap and rework as well as lower product warranties and liabilities through preventive quality measures - Reduced marketing, sales and service cost for repurchasing of existing or acquiring new customers through increased quality reputation and customer loyalty - Lower product development and manufacturing cost through focusing on customer perceived quality driving product characteristics in design and manufacturing - Reduced manufacturing, logistics, sales and service cost through lower efforts of post-design adaptations, re-planning and reworks - Increased proactive learning and increased customer knowledge on quality specifications of customers through pre-specified conformity levels	*E.o. speed* through shortened development time of new products leading to - Lower opportunity cost of lost sales through quick product introduction - Less time required to achieve e.o. scale level of late followers - Lower development cost through shorter period of time for person-hours and funds spent as well as stronger goal orientation - Reduced production cost through faster receiving feedback and gaining experience as well as purchasing non-innovation relevant, standard parts - Lower marketing and sales cost through less efforts for retaining customers due to innovator's ability to set industry standards and innovative reputation - Increased proactive learning and customer knowledge on future needs of customers through high frequency and time-wise responsiveness
Indirect cost reductions	Differentiation induced volume increases raise *e.o. scale*	Customer perceived *flexibility* leading to - *E.o. scope* through utilizing quasi-public modular architecture	Customer perceived *individualization* leading to - *E.o. scope* through utilizing quasi-public customer information	Customer perceived *quality* leading to: - *E.o. scope* through utilizing quasi-public preventive quality institutions	Customer perceived *innovation* leading to: - *E.o. scope* through utilizing quasi-public speed and quality institutions

However, implementing and running HS concepts is also increasing cost resulting from higher direct cost, higher management complexity, additional risks as well as extended investments.

Similar to cost decreasing effects, cost increases cascade in direct and indirect effects. In both of these categories commonalities exist across HS types. While common direct cost increases result mainly from higher labour cost driven by increased skill requirements, common indirect effects origin from higher management complexity, increased transformational and operational risks and rising capital cost.

For all HS types, better skilled employees are engaged in cross-functional teams working for example on modular architectures *increases direct cost*. Similarly, the complexity of implementing and operating HS rises for example by building up an agile manufacturing system or integrating external partners in the value chain. Analogously, transformational and operational risks grow driven by higher likelihood to fail due to increased complexity or higher impact of failure due to higher investments committed. Moreover, higher investments raise cost of capital due to more funds required for implementing a consistent HS concept.

While the above-mentioned links of cost increasing effects are commonly shared across all types of HS, the underlying mechanism of producing the effects are different for each type. Thus, for example, higher cost for achieving substitution economies result from higher development and coordination efforts or higher search and test costs dependent on modular architectures, while, for example, higher cost for achieving quality economies are explained by cost of operating a preventive quality system or the period of time and effort necessary for building up a quality reputation. Figure 12 provides a detailed overview on common and concept specific cost increasing drivers.

Figure 12: Overview synthezised cost increasing drivers

Effect	Common drivers	Specific operationalisation of common drivers			
		SQHS	VCHS	QCHS	ICHS
Direct cost increases	Labor cost Skill requirements	Higher cost for achieving substitution economies through - Higher development and coordination cost through modular design and potentially over dimensioned modular architectures - Higher search and test costs through increased amount of product components and configurations	Higher cost for achieving variety economies through - Higher development cost through modular design and platform commonality - Higher cost of product variants through smaller lots in production, logistics, and distribution - Higher assembly and distribution cost by postponement and configuration - Higher marketing and service cost by amount of customer interaction required and information processed	Higher cost for achieving quality economies through - Higher cost of operating a preventive quality system - Higher (opportunity) cost through longer period of efforts and delayed realization of benefits through high quality reputation	Higher cost for achieving innovation economies through - Increased 'hidden cost' of speed from more mistakes, heavy usage of resources, workflow disruptions and reduced performance specifications of products - Higher cost of operating a preventive quality system
Indirect cost increases through management complexity	Management complexity	Increased complexity driven by lateral and vertical integration as well as allocation of scarce resources	Increased complexity through broadening firm product and service portfolio and additional requirements in planning and control	Increased complexity through demanding concurrent attention to customers, competitors and cross-functional coordination	Increased complexity through faster product development and balancing concepts of speed and quality
Indirect cost increases	Tranforma-tion and operation risk	Risk driven by development failures in modularity	Risk driven by implementation failure in customization	Risk driven by implementation failure in quality	Risk driven by implementation failure in speed and quality
	Capital cost	Higher initial investments in modular architectures required	Higher initial investments in flexible production systems and sophisticated IT systems	Higher initial investments in preventive quality system	Higher initial investments in flexible production and IT systems

D.2. SYNTHESIS OF ACTIVITIES, CAPABILITIES AND RESOURCES

D.2.1. SYNTHESIS OF HS ACTIVITIES

Synthesizing HS activities requires comparing individual HS activity profiles and identifying commonalities across them. The synthesized model is analogously to the specific HS types based on Porter's value chain concept structured. This concept differentiates between primary activities – directly influencing value generating activities – and support activities – indirectly affecting a firm's value generation by supporting the performance of primary activities (Porter, 1985). Thus, the structure of the synthesized model consists of support activities in firm infrastructure (I.1-FI), human resources (I.2-HR), technology management (I.3-T) and procurement (I.4-P) as well as primary activities in RD (II.1-RD), inbound logistics (II.2-IL), operations (II.3-O), outbound logistics(II.4-OL), MS (II.5-MS), and services (II.6-S).

Furthermore, three types of activities are differentiated. First, common activities determine common activities shared across all HS types, second, specific operationalisation of activities specifying differences in implementing or operating activities of HS types, and last, specific activities only found in one or a few HS types. While a C indicates common activities, an O and an S signifies specific operationalisations and specific activities respectively. This differentiation is applied in the following for capabilities and resources as well.

The *synthesized activities on firm infrastructure* level are decomposing and reconstructing the value chain. In particular, all HS types consistently separate overall value chain activities in activities which are necessarily provided by the firm itself and products and services supplied by external partners. Thus, HS firms are able to focus and concentrate on customer value generating activities, while contracting non-value generating, standard components or services externally. For doing so, however, strong networking with external partners such as suppliers is required. In turn, however, both these activities depend on selecting and integrating the 'right' external partners in purchasing. This shows on a conceptual level, that activities form activity systems, which then can generate reinforcing effects. In that particular case, neither the first activities nor the last one has the stand-alone potential to generating the desired HS effects. Analogously, the firm infrastructure activities of applying flat organizational hierarchies and collaborating in self-managed, cross-functional teams are associated. Moreover, also *common HR activities* across the various HS types exist. First, sharing and reusing of knowledge, which is reinforced by for example flat hierarchies and self-managed, cross-functional teams. Second, educating and training employees frequently achieved through employee rotation reinforcing cross-functional collaboration. Finally, a com-

mon HR practice for all HS is involving employees in decision making or empowering them for decision taking, which is strongly supporting for example self-managed team structures. This obvious importance of HR activities is further aggravated by considering some of the above mentioned synthesized HS firm infrastructure activities such as flat hierarchies, cross-functional collaboration or self-managed teams also directed towards employees. Figure 13 provides an overview on all HS specific activities in firm infrastructure and HR as well as on activities commonly applied across all HS types.

Above that, *technology* activities focusing on sophisticated manufacturing and ICT are cornerstones for implementing and operating all types of HS. These are for SQHS and VCHS specifically manufacturing technologies supporting modular product and process architectures in terms of flexibility and adaptability, for QCHS efficient and high quality and for ICHS computer integrated manufacturing systems. In addition, ICT activities are of major importance for implementing and running HS as the amount of information collected from suppliers, customers and distributers and thus the volume of data analyzed and applied in and across the firm's functions significantly increases. Consequently, ICT is required for coordinating the firm's internal value creation as well as its external value chain partners. As already mentioned above, this requires from a *purchasing* activity point of view to select and integrate the appropriate partners capable of supporting this activity.

Another major activity area showing commonalities across HS types is *RD*. One of these commonalities is to focus activities on architectural or process level rather than on product level. In particular, SQHS and VCHS are focusing on modular architectures and decoupling processes from products. Furthermore, QCHS is emphasizing quality of processes in development or manufacturing, while ICHS is concentrating on specific process aspects of speed and quality. Similar to this, all HS types apply concurrent activities for example in parallelising product development processes or product development and RD processes. Again, this is possible through and reinforced by other activities such as cross-functional collaboration, flat hierarchies, external partner integration or information processing. In that line of reasoning, also the next common RD activities 'continually improve processes' and 'early involve manufacturing in RD' is essential. Furthermore, as already mentioned before, customer information need to be applied in RD for product development and identifying customer perceived core components the firm should focus on. Finally, all types of HS commonly share preventive activities used for improvements or acceleration. For example, SQHS and VCHS create 'overdimensioned' modular platform design allowing for product

variants. Similarly, QCHS apply preventive quality for increasing overall product and process quality and ICHS focus on preventive speed and quality measures for decreasing product introduction time.

In *inbound logistics* no specific and consequently no common activities were theoretically identified. Figure 14 provides a summary of common and specific activities in technology, procurement, RD.

Additionally, common activities exist in *operations* as well. The focus on manufacturing technology and especially on high quality and stable but flexible manufacturing systems is uniform for each HS type. Although, activities in continuous improvement are shared across HS types, different foci distinguish them. While SQHS for example focuses on continuous improvement of work processes through codification and standardization, VCHS stresses activities focused on process capabilities and manufacturing know-how. However, by far the broadest set of activities in terms of activities in continuous improvement is applied in QCHS quality function deployment based on a total quality management orientation. On top of that, as already addressed before, activities integrating product development and manufacturing are evident in each HS type. In *operations logistics* only SQHS and VCHS are following similar activities, however, no overall, common activities can be theoretically identified. Figure 15 provides an overview on common and specific activities of HS in operations and operations logistic.

The various HS type specific MS activities also share some overall commonalities. These are mainly establishing close customer relationship, capturing customer needs and applying ICT for processing of customer information. Beginning with the first, all HS types establish customer relationship through intensely involving or integrating the customer in the value creation process. In combination with preventive activities, all HS types involve them as early as possible without functionally restricting it however. Rather, the 'voice of the customer' is regarded comprehensively in and across all functions of the firm. In turn, this allows HS firms, as mentioned above, to focus their activities on customer perceived, core components, quality standards, or innovation needs. While, however, the amount of customer information required for this activity already signifies the importance of ICT activities necessary, this is further stressed through the need to include additional relevant customer information from for example external partners such as distributers. Moreover, customer information are generated in almost each of the firm's functions and value chain steps which also need to be collected, aggregated, analysed and disseminated across the organization. In consequence, this further stresses the importance of activities in ICT. Figure 16 provides an overview on common and specific marketing, sales and service activities.

Figure 13: HS activities in firm infrastructure and human resources

	Common activities	Specific operationalisation of common activities (O) and type specific activities (S)			
		SQHS	VCHS	QCHS	ICHS
I.1-FI	C: Decompose and reconstruct value chain	O: Partition overall value chain and coordinate internal and external component provision O: Decompose and reconstruct internal processes and structures as well as external value chain	O: Separate the value chain according to customer specific and customer neutral activities O: Couple customer neutral, standard activities loosely and couple activities contributing to customer value tightly	O: Separate the value chain according to functions perceived by customers as important or unimportant O: Decompose and reconstruct a firm's internal system and external value chain	O: Separate the value chain according to product specific or indifferent inputs O: Decompose and reconstruct a firm's internal system and external value chain
	C: Collaborate in self managed teams and flat hierarchies	S: Apply flat hierarchies and self-managed, independent units		S: Apply management with low desire for total control and respect to the abilities of employees	S: Create flat hierarchy structures with autonomously steered, with decentralized decision power equipped, cross-functionally integrated development units
		O: Collaborate in cross-functional teams	O: Cross-functional team collaboration	O: Cross-functional team collaboration	O: Cross-functional team collaboration
			S: Automate links between modules		
		S: Decentralize sales and marketing units			S: Locate development teams physically close to manufacturing
	C: Network with external partners	O: Establish market driven, dynamic partner networks Establish supplier networks for customer neutral components	O: Establish network of suppliers, distributors, and retailers willing and ready to attend to the system's demands	O: Establish collaboration across whole organization and with external partners	O: Establish network of external partners providing complementary competencies or customer-neutral, standard components
		O: Establish retailer network granting access to interconnected information			
	C: Share and reuse knowledge	O: Incentive based reuse and transfer of knowledge, architecture and components	O: Share and reuse market and customer insights	O: Share and reuse knowledge	O: Support knowledge and information exchange
I.2-HR	C: Educate employees		O: Develop employees especially in advanced and new technologies		
		O: Continually retrain, rotate and develop employees	O: Educate and motivate workers	O: Educate and train employees on quality management	O: Rotate employees across different functions and divisions
		O: Empower employees in autonomous, distributed teams	O: Involve employees in refining existing skills and developing manufacturing capabilities	O: Involve and empower employees on quality and continuous improvement	O: Align employees on incremental innovation by for example emphasizing specific roles such as product champions
	C: Involve, motivate and empower employees	O: Involve employees in reconfiguration and learning			

C: Common activity O: Specific operationalisation of common activity S: Specific activity

Figure 14: HS activities in technology, purchasing and RD

	Common activities	Specific operationalisation of common activities (O) and type specific activities (S)			
		SQHS	VCHS	QCHS	ICHS
I.3-T	C: Apply sophisticated manufacturing technology	O: Apply sophisticated manufacturing technology	O: Apply computer technology for flexible manufacturing	O: Apply efficient and high quality manufacturing system	O: Apply computer integrated manufacturing
	C: Apply ICT for coordinating internal system and external value chain	O: Apply ICT for coordinating customer specific and customer neutral value chain activities	O: Apply ICT for analyzing and integrating entire supply chain	O: Apply ICT application along value chain	O: Apply ICT for achieving speed and integration along value chain
I.4-P	C: Select and integrate external partners providing customer neutral, standard components or services	O: Select appropriate vendors for supply of customer neutral, standard components	O: Integrate external supply and distribution partners	O: Integrate external supply and distribution partners	O: Apply selective outsourcing of customer neutral, standard components
II.1-RD		S: Design products modularly	S: Design products modularly		
		S: Reuse product architectures, interfaces, components and structural units	S: Reuse product architectures, interfaces, components and structural units		
	C: Focus on architecture and processes, not produrcts	O: Focus on architectures not products	O: Focus on creating processes decoupled from products	O: Focus on processes rather than products	O: Focus on speed of development process and customer perceived quality
	C: Concurrently plan, develop and engineer	O: Modularity decouples processes for developing new products allowing concurrent product development processes as well as basis for agile manufacturing	O: Concurrent in-house engineering and manufacturing capabilities for aligning RD and manufacturing	O: Establish a concurrent planning and design process	O: Organize development process with a focus on planning, time evaluation and technology appliance
	C: Continually improve products and processes	O: Focus on continual improvement in architecture and component design	O: Focus on continual improvement in architecture and component design	O: Focus on continual improvement of design processes and product design	O: Focus on continual improvement of product design
	C: Early involve manufacturing	O: Include manufacturing early in product development	O: Include manufacturing early in product development	O: Include manufacturing early in product development	O: Include manufacturing early in product development
	C: Apply customer information in RD	O: Apply customer information in product development	O: Apply customer information in product development	O: Include voice of customer in all stages of product development	O: Apply customer information in product development
		O: Apply customer information for identifying core components	O: Apply customer information for customer specific product configurations		O: Apply ICT for speeding up product development
	C: Apply preventive, upfront measures for improvement or acceleration	O: Create architectural platforms for allowing product variants	O: Create architectural platforms for allowing product variants	O: Apply preventive quality for increasing overall product and process quality	O: Apply preventive speed for increasing overall speed of product introductions
		O: Prototype rapidly			O: Prototype rapidly
II.2-IL					

C: Common activity O: Specific operationalisation of common activity S: Specific activity

Figure 15: HS activities in operations and outbound logistics

	Common activities	Specific operationalisation of common activities (O) and type specific activities (S)			
		SQHS	VCHS	QCHS	ICHS
II.3-O		S: Couple technology development on components and decouple on architecture level	S: Design processes modularly		
	C: Focus on manufacturing technology	O: Focus on modular and agile manufacturing structures	O: Focus on automation and standardization in manufacturing	O: Focus on preventive quality in manufacturing	O: Focus on flexible manufacturing minimizing lot size, allowing producible layout, and improved scheduling
	C: Continuously improve operations	O: Continuous improvement of work processes through codification and standardization	O: Continually improve process capabilities and know-how in manufacturing	O: Continually improve operations	O: Continual improvement emphasis on processes
	C: Apply customer information in manufacturing	O: Apply customer information in form of customer required combinations in manufacturing	O: Apply customer information in process development and customer specific manufacturing	O: Apply customer information in form of customer required specifications in manufacturing	O: Apply customer information in form of customer feedback or change requirements in manufacturing
	C: Integrate product development and marketing with production planning and operations	O: Integrate across functions while maintaining excellence within each function	O: Integrate activities of people and support tools		
			O: Integrate marketing, sales and production for production planning	O: Integrate product development and production	O: Integrate product development and production through deploying customer information on detailed level of manufacturing operations
			O: Assemble customer specific components late in production		
	C: Invest long-term	O: Invest long-term in advanced manufacturing technologies and ICT	O: Invest long-term in advanced manufacturing and ICT	O: Invest long-term in preventive quality and ICT	O: Invest long-term in advanced manufacturing and ICT
II.4-OL		S: Assemble components decentral and late in outbound processes	S: Assemble customer specific components late in logistics process		
		S: Apply customer information for delayed assembly	S: Adapt fulfillment process to each particular customer		

C: Common activity O: Specific operationalisation of common activity S: Specific activity

Figure 16: HS activities in MS and services

	Common activities	Specific operationalisation of common activities (O) and type specific activities (S)			
		SQHS	VCHS	QCHS	ICHS
II.5-MS	C: Establish close customer relationship	O: Establish customer relationship through modularly upgrading and extending products	O: Collect and enhance customer information by continuous, direct interaction in product specification	O: Establish close customer proximity through including customer requirements in product specification	O: Establish close customer relationship through identifying new customer needs not yet satisfied
	C: Capture customer needs and focus on customer perceived value	O: Gain fast feedback from customers through real time market research	O: Determine customer required variety real time according to product configurations specified	O: Determine antecendent customer needs	O: Gain fast feedback from customers through real time market research
		O: Focus on customer perceived, core components impacting customer satisfaction	O: Focus on customer perceived, core components impacting customer satisfaction	O: Focus on customer perceived quality standards	O: Focus on new technologies and technological changes offering customer opportunities
	C: Apply ICT to quickly collect, aggregate and analyse customer information as well as disseminate it across functions and teams	O: Apply ICT for receiving fast customer feedback	O: Apply ICT for supporting customer in elicitation and after-sales	O: Apply ICT for collecting and analysing information from existing potential customers and competitors	
		O: Manage knowledge and information flows with other firms and with product markets	O: Aggregate information from suppliers, distributors and retailers	O: Collect and enhance customer information through marketing, sales and service	O: Experimentally market new products for generating fast customer feedback
		O: Capture customer information on modular product configurations demanded	O: Capture information on customer specific product configurations ordered	O: Collect relationship based information on consumption purposes and perceived quality	O: Capture and disseminate information from fast paced product introductions as basis for quality decisions on new products
	C: Continually measure, analyse, and exchange knowledge on customers	O: Continually measure, analyse, and exchange knowledge on customers	O: Continually measure, analyse, and exchange knowledge on customers	O: Continually measure, analyse, and exchange knowledge on customers	O: Continually measure, analyse, and exchange knowledge on customers
	C: Research on competitor and market information	O: Research competitor and market information for identifying uncovered customer needs	O: Research competitor and market information for identifying uncovered customer needs	O: Benchmark (customer perceived) competitor product quality constantly	O: Apply competitor information for identifying opportunities for incommensurability
			S: Excite customers for individualization		
	C: Research with focus on mass markets	O: Market research focus on mass markets	O: Market research focus on latent market niches	O: Market research focus on mass markets	O: Market research focus on future market opportunities in mass markets
			S: Focus and integrate RD and marketing		
			S: Establish trust in elicitation process		S: Apply marketing techniques tailored to fast innovation cycles
II.6-S	C: Service used for information collection	O: Service used for information collection	O: Service used for information collection	O: Service used for information collection	O: Service used for information collection
			O: Establish trust by supporting tools in after sales		

C: Common activity O: Specific operationalisation of common activity S: Specific activity

D.2.2. SYNTHESIZED HS CAPABILITIES AND RESOURCES

Synthesized capabilities are identified through identifying commonalities across the different HS types. The structure for developing the synthesized capabilities model is analogous to the specific HS types and differentiates operative resources and capabilities, management capabilities as well as company culture.

As already indicated by the results of the literature review on HS, resources are of inferior importance for combining competitive advantages. The specific types and thus the synthesized model corroborate this finding as only *one operative resource* – sufficient funds for required investments – is evident. However, this resource is essential for all different HS types for initiating the HS underlying, self-reinforcing effect of 'rising differentiation-volume increase-cost reduction'. Complementing activities for this resource are for example investments in preventive institutions required for modular architectures, flexible manufacturing or ICT systems, or preventive quality.

While only one operative resource is common to all HS types, *four common operative capabilities* are evident. The first is concerned with informational and analytical information processing, which is required for example for RD activities such as receiving and utilizing fast customer feedback on experimental product designs and incorporating it in product development. Another commonality exists on operating stable but flexible, computer integrated manufacturing systems. VCHS, for example, require producing a high amount of product variety at near mass producer's cost with a stable but flexible manufacturing system allowing adapting to changing customer needs. Over time, these external changes generate stable, recognizable patterns of internal manufacturing requirements and thus, allow VCHS to institute *stable, flexible platforms* of process capabilities for meeting frequently changing external needs. Furthermore, this contributes to the third common operational capability, organizational and individual learning by providing a lasting platform on which learning effects can take place. This common platform for learning, however, depends on the type of HS and can be either process or organization architecture in SQHS, stable manufacturing platform or customer information in VCHS, preventive quality institutions in QCHS, or computer integrated manufacturing in ICHS. Thus, while common in general the specific organizational and individual learning capability differs with respect to the HS concept applied. Furthermore, all HS types share the capability of identifying and satisfying customer needs. Consequently, all HS firms are capable of sensing, collecting and analysing customer, competitor and partner information for identifying customer preferences. However, this information needs to be utilized for aligning the internal

operations with these needs. Thus, HS firms have the capability to transfer customer preferences in product development, manufacturing, marketing, sales and services.

In addition, the cross-type comparison disclosed *five common management capabilities*. One of them is the capability to manage internally systems oriented and externally value chain oriented. Both are based on management's systems theoretical understanding of the internal and external value chain. This capability is essential for vital HS as it is for example providing the decision basis for internalizing or externalizing parts of manufacturing or services depending on customer perceived value generated. This in turn requires a process decomposition capability allowing distributing activities within the firm and across a network of partners. This capability interacts for example with the activity of applying customer information for distinguishing core from customer-neutral components. Another management capability is knowledge oriented. In particular, HS firms need to be capable to manage knowledge. While already being of immanent importance from an internal point of view, this becomes even more important with external partners as knowledge needs to be transferred across firm boundaries and distributed within a network of firms. This leads to the next management capability of integrating external partners. This demands HS firms on the one hand to posses a network oriented, structural management capability allowing partner collaboration along the whole value chain. On the other hand, it requires the capability to evaluate, select and integrate these partners into the firm's value creation. Next to this, a capability to identify, evaluate and capture future customer or market opportunities is necessary. This demands HS firms to determine not just the customer's current preferences and requirements but also the future ones. Thus, it is obvious that this capability strongly coincides with the activity to establish a close and intense relationship as basis for deriving future customer needs. The last management capability is focused on employees and especially on educating and sustaining them. For that reason, HS management needs to be capable of involving employees in decision making and encouraging education and training. By this, employee skills and capabilities are best utilized. In addition, management attention is refocused from operational management capabilities to the 'hybrid' capabilities mentioned above.

In contrast to the other capabilities, company culture is common across all types of HS. Thus, all HS share five common characteristics: strong employee commitment to customer satisfaction, collaboration and knowledge exchange, change affinity and customer orientation, long-term and mass-market orientation. First and foremost, a culture of employee commitment is essential for all vital HS. However, committed employees are not an end in itself; rather firms seek to gain broad-based commitment in order to

satisfy customers. This in turn, is depending on the HS concept applied and may lead for SQHS to foster employees to focusing on product and organisational architecture, VCHS to flexible customer solutions, QCHS to quality and ICHS to speed not neglecting quality. Consequently, the culture needs to provide clear employee orientation on *one, single, exclusive* strategic concept. If not, disorientated employees need to be constantly steered and controlled by a firm's management towards contradicting goals finally leading to an inconsistent, management based HS (Fleck, 1994). This 'single focus culture', however, relies on specific activities and capabilities. An activity necessary to achieve such a single-minded focus is for example employee training and education allowing (re-)establishing this focus. Additionally, the cultural focus needs to be supported by the firm's management through providing goal-oriented incentives allowing focusing on one single concept. Furthermore, firm's applying HS are characterised by a common focus on customer orientation and change affinity. While the first is deriving from the firm's strong focus on one HS concept allowing combining two competitive advantages and thus serving customers better then competitors, the second is oriented to being adaptable to external change requirements. Thus, the single-minded focus should not be mistaken as 'stubbornness', rather it is a general orientation providing the basis for adapting to changing customer needs. This way, SQHS modularity allows adapting to customer needs without changing the underlying concept; rather the opposite, constantly following a consistent concept of modularity grants adaptability to customer needs. For doing so, however, a firm's culture needs to foster collaboration and knowledge exchange within the firm and with partners. This is essential for example for aligning on adaptation needs based on external customer requirements across the whole organization. For example, in case of modularity this allows identifying the level of adaptations – on component or on architecture level – necessary. Moreover, HS firm culture needs to emphasize long-term orientation. However, this long-term orientation is not to be confused with inflexibility as long-term, sufficient investments for example in agile manufacturing systems are the basis for HS flexibility. Furthermore, the combination of single-mindedness and long-term orientation provides the basis for generating most of HS type specific economies. Only if, for example, the sole focus on preventive quality is followed for a longer period of time, a consequent utilization of the quality institutions is possible. In case of changing that orientation frequently, high initial investment in that institution will not pay off. The last cultural characteristic shared across all HS types is a focus on mass markets. This can be seen as the logical consequence of applying HS concepts based on achieving significant levels of production volumes for

realizing concept specific as well as scale and scope economies. Figures 17 to 19 provide an overview on HS operative and management capabilities as well as on firm culture.

Figure 17: HS type specific operative resources and capabilities

	Common capabilities	Specific operationalisation of common capabilities (O) and type specific capabilities (S)			
		SQHS	VCHS	QCHS	ICHS
OR	C: Sufficient and long-term investment	O. Sufficient and long-term resources to invest in manufacturing and information and communication technology (ICT)	O: Sufficient and long-term resources to invest in manufacturing and information and communication technology (ICT)	O: Sufficient and long-term investment in preventive quality and ICT	O: Sufficient and long-term investment for sustaining the cumulative innovation process until financial returns
OC		S: Modular design capability	S: Modular design capability		
	C: Capability to implement and operate ICT	O: ICT evaluation and application capability	O: Capability to implement and operate ICT in configuration, manufacturing, planning, order tracking and relationship	O: Capability to implement and run ICT for determining e.g. design or manufacturing specifications	O: Capability to implement and operate ICT for integrating value chain
	C: Capability to process and analyse information	O: ICT capability to process increased information and communication requirements	O: Capability to process high amount of information	O: ICT capabilities allowing to processing high amount of information	O: ICT capability to process high amount of information
	C: Operate stable, but flexible, computer integrated manufacturing	O: Capability to operate an efficient and agile manufacturing system	O: Capability to operate a stable, but flexible, highly standardized and automated manufacturing system	O: Capability to run an efficiently and high quality manufacturing system	O: Capability to operate a computer integrated manufacturing system
		S: Experimental product development capabilities	S: Experimental product development capabilities		S: Experimental product development capabilities
	C: Organizational and individual learning	O: Organizational and individual learning by using, doing and experimenting	O: Organizational and individual learning based on customer relationship	O: Organizational and individual learning based on customer information resulting from operating preventive quality system	O: Organizational and individual learning based on customer relationship and external knowledge exploitation
	C: Capability to sense and respond to customer preferences and align operations accordingly	O: Component oriented customer value analytic capability	O: Capability to identify customer perceived value adding activities	O: Capability to identify, structure and prioritize customer needs captured by marketing, sales and services	
		O: Research capability on customers, competitors and suppliers	O: Capability to sense customer preferences and transfer customer preferences in configurable products	O: Capability to sense customer preferences and transfer customer preferences in quality products	O: Capability to sense and respond to market opportunities
		O: Capability to standardize, automate and codify	O: Capability to manage multitude of product variants in development and manufacturing	O: Capability to include voice of the customer in product development and manufacturing	O: Marketing and sales capability for accessing customers quickly and convincingly
					S: Capability to quickly transform new technologies in products and processes
					S: Capability to recognize, assimilate and apply external knowledge
					S: Combining internal and external sources of innovation for increased learning and know how development

C: Common capabilities O: Specific operationalisation of common capabilities S: Specific capabilities

Figure 18: HS type specific management capabilities

	Common capabilities	Specific operationalisation of common capabilities (O) and type specific capabilities (S)			
		SQHS	VCHS	QCHS	ICHS
MC	C: Capability to manage systems based	O. Capability of identifying change requirements and strategy adoption as well as firm specific adaption of generic concepts	O: Management of value chain stages based on customer neutral or specific activities	O: Management of value chain stages based on customer neutral or specific activities	O: Capability to identify component or capability supplements
		O: Process and function decomposition capability	O: Capability to balance external and internal variety through instituting stable, flexible platforms of processes	O: Capability to balance external and internal quality through instituting preventive quality	O: Capability to balance external and internal innovation through incremental innovation
		O: Business architectural (re-)configuration and transformation capability			
	C: Capability to manage knowledge	O: Capability to transfer knowledge	O: Capability to explicate, aggregate and administer customer knowledge	O: Extensive knowledge management capabilities for reusing existing resources and capabilities	O: Knowledge management capability to combine in-house scientific knowledge with external knowledge
		O: Structural interface specification and alignment capability		O: Integrating customer satisfaction and internal process execution through focusing on perceived customer quality and continuous design and process improvement	
	C: Capability to integrate external partners	O: Internal and external resource combination and assimilation capability			
		O: Network oriented, structural management capability	O: Network management capability across overall value chain	O: Capability to collaborate with external partners along the whole value chain	O: Capability to collaborate with external partners providing complementary, cutting edge knowledge on changing technologies
		O: Partner evaluation, selection and integration management capability			
	C: Capability to identify, evaluate and capture future market opportunities		O: Capability to identify and capture latent market niches		O: Capability to adopt new technologies and adapt to technological changes
		O: Capability to adopt new technologies and adapt to technological changes	O: Capability to adopt new technologies and adapt to technological changes	O: Capability to determine enduring customer requirements	O: Distinct capabilities in identifying technological, market or competitive uncertainties in generating innovations and allocate resources accordingly
		O: Capability to involve employees in decision making and encourage education and training	O: Capability to involve employees in refining existing skills and developing manufacturing capabilities	O: Capability to involve employees in decision making and encourage education and training	O: Capability to involve employees and to direct attention and commitment to speed
	C: Capability to educate and sustain employees	O: Capability to substitute overt management authority by embedded coordination	O: Capability to educate and sustain employees	O: Capability to educate and sustain employees	O: Capability to educate and sustain employees
			S: Forecasting capability	S: Strategic planning capability	S: Planning capability
	C: Provide objectives and incentives for orientation	O: Provide incentives for documenting and sharing knowledge	O: Provide target values for products and processes	O: Provide product and process oriented target values	O: Provide time-based, project oriented objectives
	C: Capability to build long lasting customer relationships	O: Capability to build lasting, learning customer relationship based on modular flexibility	O: Capability to build lasting, learning customer relationship based on individual customer needs	O: Capability to build lasting, learning customer relationship based on product longevity and reliability	O: Capability to build lasting, learning customer relationship based on idea and technology leadership

C: Common capabilities O: Specific operationalisation of common capabilities S: Specific capabilities

Figure 19: HS type specific company culture

	Common capabilities	Specific operationalisation of common capabilities (O) and type specific capabilities (S)			
		SQHS	VCHS	QCHS	ICHS
CC	C: Culture fostering employee commitment to HS concept and customer satisfaction	O: Culture of full commitment to product and organization architecture and customer satisfaction	O: Culture of full commitment to flexibility and customer satisfaction	O: Culture of full commitment to quality and customer satisfaction	O: Culture of full commitment to speed and quality
		O: Culture emphasizing modularity conform behavior of reuse and sharing	O: Culture emphasizing external orientation and information analytics	O: Culture focusing on factual or 'quasi-scientific' decision making	O: Culture focusing on external knowledge and information
	C: Culture fostering customer orientation and change affinity	O: Culture fostering customer and employee orientation and change	O: Culture fostering customer and employee orientation and change	O: Culture allowing employee participation and empowerment and fostering adaptability	O: Culture fostering customer and employee orientation and change
					O: Culture enabling collaboration and reducing resistance to external ideas or technology
	C: Culture fostering collaboration and knowledge exchange	O: Culture fostering interactions through institutionalized organizational mechanisms	O: Culture fostering interactions through institutionalized organizational mechanisms	O: Culture fostering cross-functional and cross-divisional team collaboration as well as external partner integration	O: Culture establishing internal cooperation
		O: Collaboration and exchange fostering culture	O: Culture fostering knowledge creation and distribution across the overall value chain	O: Culture fostering communication and knowledge exchange	O: Culture fostering communication, knowledge exchange and learning
	C: Culture fostering long-term orientation	O: Long-term orientation	O: Long-term orientation	O: Long-term orientation	O: Long-term orientation
	C: Culture focusing on mass markets	O: Orientation towards mass markets	O: Orientation towards mass markets	O: Orientation towards mass markets	O: Orientation towards mass markets

C: Common capabilities O: Specific operationalisation of common capabilities S: Specific capabilities

D.3. SYNTHESIZED HS MODEL

The synthesized HS model shown in figure 20 combines all *common* elements of HS in respect of underlying concepts and activity drivers, activities, capabilities and resources. However, instead of repeating same arguments included in chapters describing specific HS types, this chapter focuses on analysing the generative mechanisms underlying the synthesized model. For this purpose, the synthesized activity system and activities are of particular importance as they allow describing *what is* necessary for implementing and operating HS and for coping with the relevant activity drivers. Thus, the major focus is on describing the set of activities HS apply in common for achieving competitive advantage (Mintzberg, Lample, Quinn, & Goshal, 2003). By this, the general principles of HS implementations can be identified (Sheehan & Foss, 2007). In addition, a focus on activities allows determining the fit within an activity system achieved through consistency, mutual reinforcement, and comprehensive system optimization (Mintzberg, Lample, Quinn, & Goshal, 2003). Furthermore, it allows describing the capabilities and resources deployed by the activities (Ray, Barney, & Muhanna, 2004). Thus, a firm's activity system and its activities are central for explaining the general principles of HS.

Based on the activity drivers, two broad areas of activities can be differentiated: Customer oriented and internally oriented activities. However, it needs to be clarified that despite assigning activities to the one or the other, activities are typically interrelated and thus, the overall activity system is the only appropriate level of analysis. Nonetheless, for describing the major underlying mechanisms this differentiation seems reasonable as it allows depicting subsets of mechanisms.

Customer orientation is primarily concerned with customer satisfaction. Customer satisfaction, in turn, is a result of specific activities requiring identifying the underlying mechanisms. From the synthesized model, two main customer oriented principles derive: First, customer centricity in all activities and second, focus on customer value. Activities supporting the customer centricity are capturing customer needs and continuously involve the customer from initiating product ideas, collecting customer feedback and considering it in all value chain steps, appreciating customer's consumption or application purposes, establishing close customer relationship and supporting customer information processing, analysing and disseminating within and across the firm's boundaries. This means HS firms practice a set of activities or an activity system allowing to centre everything on the customer and the customer's needs.

However, HS firms extend beyond this customer centricity by dedicating its activities on customer value. Or more specifically, HS firms concentrate on only those activities contributing to customer perceived value. Activities supporting this focus on customer value are capturing customer needs, identifying customer perceived important product or service features, decomposing and reconstructing the firm's internal and external value chain, networking with partners, purchasing non-critical, standard components or services from external partners, outsourcing value chain steps, elaborating on external knowledge, and applying ICT for aligning all value chain steps on customer value.

Systems based management allows HS firms partitioning the value chain in activities contributing to customer perceived value components and standard or neutral components. Activities supporting such a systems based orientation are managing the internal system of value creation, selecting and integrating external partners, focusing on modular architectures, and applying ICT for coordinating the internal system as well as the external supply chain. All these activities are strongly interrelated to the above-mentioned activities for achieving customer centricity and customer value focus. Furthermore, internally oriented activities focus on prevention, overdimensioning, flexibility, concurrence, employee empowerment and information processing. Prevention is related to activities for establishing and operating institutions early in the value chain allowing avoiding cost in forthcoming value chain activities. Or put differently, vital HS try to 'do things right in the first place' instead of trying to correct things during the course of the value creation process leading to lowering efficiency and effectiveness in development, manufacturing, marketing, sales and service. Activities related to prevention are for example potentially overdimensioned product or systems architectures, stable but flexible manufacturing systems, or preventive quality or speed systems. Overdimensioning is related to including degrees in freedom for example of modular product designs or flexible manufacturing systems. In that line of reasoning, prevention and *flexibility* somehow collapse as for example overdimensioned modular architectures offer degrees of freedom for adapting certain components according to customer needs while leaving the overall architecture untouched. Thus, counterintuitively, flexibility is facilitated by stability, in this case stable modular architectures. The same mechanism operates for flexible manufacturing platforms or preventive quality and speed institutions. Additionally, flexibility is supported by applying ICT for quickly sensing and responding to adaptation needs. Concurrence refers to the time aspect of activities and is supported by simultaneously performing activities such as development and engineering, or integrating several func-

tions such as planning, developing and engineering. In addition, empowering employees is essential for HS as it frees up management authority needed for example for managing the overall system instead of steering and controlling specific activities. Thus, activities supporting this empowerment are applying flat organizational structures, fostering collaboration in self-managed, cross-functional teams, involving employees in decision making, and continuously educating and training employees. Last, all HS are characterized by information processing driven by collecting, aggregating, analysing and disseminating customer, competitor and partner information. This information is applied for orchestrating activities across the internal and external value chain and aligning employees accordingly. In particular, activities such as real-time market research or information exchange with external distribution partners found the basis for directing the firm's value chain.

In chapter V, empirically collected data from firms applying HS serve as the basis for evaluating this synthesized HS model.

Figure 20: A synthesized model

	Underlying concept	Activity drivers	Common activity system and activities	Common resources and capabilities
Differentiation adv.	Increase sales volume through customer satisfaction	Customer demands Customer involvement Total customer cost	I.1. Firm infrastructure (n=3) - Decompose and reconstruct value chain - Collaborate in self managed teams and flat hierarchies - Network with external partners I.2. HR management (n=3) - Share and reuse knowledge - Educate and motivate employees - Involve and empower employees I.3. Technology (n=2) - Apply sophisticated manufacturing technology - Apply ICT for coordinating internal system and external value chain I.4. Purchasing (n=1) - Apply selective outsourcing of customer neutral, standard, non-specific components II.1. Research and Development (n=6) - Focus on architecture and processes, not products - Concurrently plan, develop and engineer - Continually improve products and processes - Early involve manufacturing - Apply customer information in RD - Apply preventive, upfront measures for improvement or acceleration II.2. Inbound logistics (n=0) II.3. Operations (n=5) - Focus on manufacturing technology - Continuously improve operations - Apply customer information in manufacturing - Integrate product development and marketing with production planning and operations - Invest long-term in manufacturing and ICT II.4. Outbound logistics (n=0) II.5. Marketing and sales (n=6) - Establish close customer relationship - Capture customer needs and focus on perceived customer value - Apply ICT to quickly collect, aggregate and analyse customer information as well as disseminate it across functions and teams - Continually measure, analyse and exchange knowledge on customers - Research competitor and market information - Research with focus on customer needs II.6 Service (n=1) - Service used for information collection	Operational resources (n=1) - Sufficient and long-term investment ***2*** Operational capabilities (n=5) - Capability to implement and operate ICT - Informational and analytical capability to process and analyse information - Capability to operate flexible, computer integrated manufacturing - Organizational and individual learning capability - Capability to sense and respond to customer preferences Management capabilities (n=7) - Capability to manage internally system oriented and externally value chain oriented - Capability to manage, combine and integrate knowledge - Capability to identify, evaluate and capture market opportunities - Capability to educate and sustain employees - Capability to provide objectives and incentives for clear orientation - Capability to build long lasting customer relationships - Capability to integrate external partners Company culture (n=5) - Culture fostering employee commitment to HS concept and customer satisfaction - Culture fostering customer orientation and change affinity - Culture fostering collaboration and knowledge exchange - Culture fostering long-term orientation - Culture focusing on mass markets
Cost decreasing effects	Direct cost reductions through concept specific economies	Economies of : -Substitution - Variety - Quality - Speed		
	Direct cost reductions through utilizing concept specific quasi-public goods	Economies of scope		
	Indirect cost reductions through differentiation induced volume increases	Economies of scale		
Cost increasing effects	Direct cost increases through skill requirements	Labor cost		
	Indirect cost increases through management complexity	Complexity		
	Indirect cost increases through transformational and operational risk	Risk		
	Indirect cost increases through invest requirements	Capital cost		

IV. RESEARCH PHILOSOPHY, METHODS, CONSTRUCT AND DESIGN

This thesis intends to answer the question regarding the underlying mechanisms – namely consistent HS concepts and its underlying activities, capabilities and resources – enabling firms to combine competitive advantages.

This chapter starts with selecting an appropriate philosophy for this research. Therefore, first, research philosophies are identified and evaluated according to fulfilling the research's objective and critical realism is chosen as the philosophical underpinning of this research. Based on that, methods for critical realist research are presented of which a case study approach is extracted as most appropriate. In critical realism, theory development is analogous to designing a research construct explaining the generative mechanisms working in the real, the actual events caused by them and the traces of these events empirically evident. This construct guides subsequent decisions in the development of the research design. The research design of a case study follows a systematic procedure and determines the unit of analysis, case selection, relevant data, data collection and analysis (Johnston, Leach, & Annie, 1999). Furthermore, case studies – like any other research method – are subject to potential researcher bias requiring the quality of the research to be assessed (Hirschman, 1986). Accordingly, this chapter concludes by providing an overview on evaluation criteria in critical realist case research, presenting methods to cope with them and determining the methods applied specific to this research.

A. RESEARCH PHILOSOPHY

Research philosophy determines the assumptions used, the worldview underlying and the theoretical orientation of research work (Saunders, Philip, & Thornhill, 2009). The purpose of this subchapter is to understand the philosophy that underpins the choices and decisions made in taking a specific research position. In this sense, a research position is a specific philosophical stance taken by the researcher (Carson, Gilmore, Perry, & Gronhaug, 2001). It includes a specific research commitment and implies for what, how and why research is carried out (Carson, Gilmore, Perry, & Gronhaug, 2001). Thus, research philosophy's wider and deeper perspective helps researchers to have a clearer purpose of the specific research they are undertaking by setting it within a wider context. In consequence, Johnson and Clark (2006) advice business and management researchers to be aware of the philosophical commitments they make through the choice of their research strategy. This concerns not only the way research is done but also what and how we understand what is investigated (Saunders, Philip, & Thornhill, 2009). Thus, re-

search philosophy contains important assumptions about the way we see the world and therefore need to be made explicit in order to examine, challenge or adapt them (Saunders, Philip, & Thornhill, 2009). In this sense, research paradigms are overall conceptual frameworks or sets 'of linked assumptions about the world which is shared by a community of scientists investigating the world' (Desphande, 1983; Healy & Perry, 2000). Or put differently, 'a paradigm is an overall conceptual framework within which a researcher may work, that is, a paradigm can be regarded as the 'basic belief system or worldview that guides the investigator' (Perry, Riege, & Brown, 1999, p. 16).

Research philosophy contains core assumptions on ontology, epistemology, human nature, and methodology, which are linked to each other (Holden & Lynch, 2004, p. 3). While ontology asks for 'what is reality', epistemology is focused on 'what constitutes acceptable knowledge' and 'what is the relationship between reality and the researcher' (Carson, Gilmore, Perry, & Gronhaug, 2001). In contrast, human nature is concerned with the degree of determinism within the relationship between man and society (Holden & Lynch, 2004). Finally, the appropriate methodology logically follows from the researcher's persuasions on the above made assumptions.

Overall, two general ontological stances exist: objectivism and subjectivism (Holden & Lynch, 2004).

Alternatively, philosophical terms for objectivists are, positivists, experimentalists, traditionalists, or functionalists, or quantitative or scientific approaches (Hussey & Hussey, 1997; Holden & Lynch, 2004). Researchers following an objectivist paradigm 'seek cause and effect laws that are sufficiently generalisable to ensure that knowledge of prior events enables a reasonable prediction of subsequent events' (Noblitt & Hare, 1988). This view assumes an existing reality of social entities external to the mind of social actors, with objectivity achieved through the researcher's independency of that being observed (Adcroft & Willis, 2008; Saunders, Philip, & Thornhill, 2009). Contrary, subjectivists assume that social phenomena are socially constructed and that researchers become an indispensable part of that being observed (Saunders, Philip, & Thornhill, 2009; Adcroft & Willis, 2008). Alternative names of the subjectivist paradigm are humanists and interpretivists, or qualitative or phenomenological approaches (Holden & Lynch, 2004). In this notion, extreme subjectivists posit that reality does not exist outside oneself and thus reality is all imagination.

However, objectivism and subjectivism are not dichotomous opposites. Rather they mark ends of a continuum with varying philosophical positions aligned between them (Holden & Lynch, 2004). Such an

intermediate philosophical stance is realism. While direct realism assumes that the world is accurately portrayed through our senses, critical realism is more sceptical about the sensations we experience and assumes that the images of the things in the real world are not the things directly (Saunders, Philip, & Thornhill, 2009). The key shortcoming of positivism is that its strict view reduces the object of science merely to gather and predict data. This limits research to pure comparisons of gathered and predicted experience with theory. This is due to the conceptualization of strict empiricism, which just considers a theoretical, conceptual and empirical domain, meaning that nothing beyond experience can validly generate knowledge. However, such a narrow research focus makes it impossible to explain unobservable generative mechanisms that generate the empirical experiences. The second positivist shortcoming, based again on domain considerations, is based on the limited research focus of comparing experience with theory. Due to the focal point of comparison, construct, internal and external validity becomes mainly a question of empirical issues (Johnston & Smith, 2010). As a result, construct validity is assumed if the concept and the data for measuring it are consistently related and its consisting measures are distinct from each other. Thus, the assessment of validity is atrophied to statistical validation neglecting issues dealing with meaning (Johnston & Smith, 2010). In strategic management, as a practice-focused discipline, the assessment of construct validity imposes severe problems as most constructs used are socially constructed or experiential. This makes it impossible to match a measure to a behaviour or another observable outcome. In addition, internal and external validity poses challenges for empirists. While the first, is concerned to show that there is a constant conjunction between the empirical events in a closed system observed as a pattern, the second is directed to 'infer that the presumed causal relationship can be generalized to and across alternate measures of the cause and effect and across different types of persons, settings, and times' (Cook & Campbell, 1979; Johnston & Smith, 2010). The key challenge in assessing internal validity is that the evidence of constant conjunction is weak and only similarities between observed and predicted associations can be assessed. However, even if such a similarity is identified, reasoning to suppose that there is a causal relationship between the variables examined is rudimental. Thus, additional evidence – such as for example time series data – is required to prove that the observation is not a chance association (Johnston & Smith, 2010). Similarly, external validity requires making generalizations about the applicability of assumptions to unobserved objects. This, however, requires that the assumptions included in the model are tested empirically or otherwise cannot be validly applied in positivist research. This is reinforced by the limited set of environments available for data gathering in research

projects, leading to only restricted empirical results. However, as a theory's value in strategic management depends on whether it is useful for solving related, but not identical problems, empiricism falls short on 'generalizations about the applicability of assumptions to unobserved objects that is required for a researcher to claim external validity' (Johnston & Smith, 2010). This is especially true for RBV as a theory, which would lose much, if not all of its explanatory power, if its unobservable resources could be observed empirically.

A sub stream of positivism, instrumental positivism, eases that strict interpretation of positivism in response to theories including unobservables. Instrumental positivists admit value to the incorporation of unobservables, however neglect realists' claim of theory's value to knowledge. Value, according to this standpoint, results solely from a theory's capacity to explain empirical reality, not from a theory's ultimate truth or falsity (Nagel, 1979). This way, theories are solely seen as tools, such as a hammer or a saw, used to construct predictions of observable phenomena (Godfrey & Hill, 1995). In turn, instrumentalists' shift the scientific discourse from a theory's truth, which is absurd in their view, as discussing the truth of a hammer, toward the search for adequate explanations. In line with this reasoning, Friedman argued that 'the relevant question to ask about the 'assumption' of a theory is not whether they are descriptively 'realistic', as they never are, but whether they are sufficiently good approximations for the purpose in hand. And this question can be answered only by seeing whether the theory works, which means whether it yields sufficiently accurate predictions.' (Friedman, 1953, p. 15).

This is exactly the difference between views of logical and instrumental positivism. While the first considers research such as RBV as non-scientific and refuses knowledge generated from it, instrumental positivists consider RBV valuable - despite its unobservable and hypothetical character - as a theoretical construct yielding accurate empirical predictions. However, that is the pitfall of instrumental thinking. Instrumentalists assume a variety of theories yielding the same predictions but holding contradictory accounts and evoking different or additional unobservable entities (Godfrey & Hill, 1995). Through this, instrumentalists exclude the potential of deriving normative rules from such theories. Why? As far as unobservables are concerned, they are suspicious about the truth of one theory compared to others and thus, the theory behind empirical predictions remains unconfirmed, which in turn makes it impossible to derive normative rules from it, as it stays unclear which theory among the many is the appropriate basis for normative rules. For these reasons, logical and instrumental positivists negate the scientific justification of strategic management research's capability to improve managerial action. The first, based on in-

cluding unobservables in general and the second, as theories are not able to derive normative rules for advancing management practice.

Critical realism evolved as a response to such epistemological problems and derived from theories such as quantum mechanics, which contains a substantial amount of unobservables (Putnam, 1990). The building blocks of matter on subatomic level (e.g., electrons, neutrinos, quarks) are unobservable in two ways. First, calibration issues of measurement instruments do not permit direct observation (measurement unobservability) and second, subatomic particles are state unobservable meaning that observations will change the state of the particle investigated (Putnam, 1990). Nonetheless valuable knowledge can be generated, by observing the effects produced by the unobservables. Thus, unfeasible observations of unobservables are substituted by the observation of the effects caused by the unobservables (Godfrey & Hill, 1995). Popper refers to this as the common sense approach to knowledge, meaning that if a researcher's prediction based on a theory containing unobservable elements survives repeated attemps of falsifaction, it is justified to act as if the theory is true (Popper, 1972). However, despite acting as if the theory is true, realists never know for sure that the unobservable entities exist. This corresponds with the theory of truth, according to which propositions are true if, and only if, they correspond to actual conditions in the real world (Boyd, 1991a; Horwich, 1990; Tarski, 1935).

Critical realism posits a realist ontology of the world, which is independent of researcher's knowledge, however differs from positivism by holding a fallibilist epistemology in which researcher's knowledge of the world is socially produced (Miller & Tsang, 2010). By this, the objectivist key assumption of applying a natural scientific model to social sciences is neglected as studying the human world is essentially different from the physical world and necessitates a different strategy to studying it. "To be a fallibilist about knowledge, it is necessary to be a realist about things" (Bhaskar, 2008, p. 43). In consequence, nothing in the methods of science guarantees success in arriving at truth because science is a personal and social process (Miller K. D., 2005). Thus, objectivists' claims for indubitable knowledge are rejected by critical realists due to researchers' fallibility and unavoidable reliance on presumptions (Miller & Tsang, 2010). Nonetheless, epistemologically critical realists claim to generate knowledge through testing theories and logically and empirically assessing their merits by an external referent, finally leading to assessing "the veracity or falsity of scientific theories – albeit not definitely" (Miller & Tsang, 2010, S. 144). In last consequence, critical realists understand science as an ongoing process of continually improving the understanding of the mechanisms they study. Critical realists differentiate between transitive and intransitive

objects of knowledge. While, intransitive objects, which are quite independent of us, are things and structures, mechanisms and processes, events and possibilities of the world, transitive objects are subjective and their existence depends on human activity (Bhaskar, 2008, p. 22). Critical realists argue "that there are aspects of social reality which are unknown and unknowable by actors, and which have material influence on their interpretations and their practices. What exists is therefore conceptually, at least, distinct from what can be known." (Weir, Marsh, & Greenwood, 2008). In other words, our perception of what happens, what really exists, which mechanisms are causal for their happening but is unobservable, and what mechanisms cause these events is at the core of critical realism.

In critical realism, theory is developed and tested in three domains: the real, actual, and empirical (Bhaskar, 2008). The real domain includes generative mechanisms, which refer to 'the ways of acting of things' (Bhaskar, 2008). Events in the actual domain occur only if real mechanisms are enabling or preventing change (Miller & Tsang, 2010). However, empirically experiencing all events directly or indirectly is infeasible as some always remain undiscovered. Those that are empirically observed are in the empirical domain, notwithstanding the fact that unobserved events and mechanisms are real as well. However, as critical realism is combining realist ontology, that is, the existence of a world independent of researchers' knowledge of it with a fallibilist epistemology in which researchers' knowledge of the world is socially produced and thus require a need for critically evaluating theories. If an event is realized, it is the conjuncture of all of the mechanisms operating in a situation and this pattern observed is not impacted by countervailing or intervening factors. In this view, reality is stratified with each stratum being unique and showing properties that cannot be explained in terms of mechanisms operating at other levels. This treats emergent properties as dependent upon other levels, however not reducing it to mechanisms operating at those levels. Thus, critical realists seek to test explanations rather than predictions, which is in stark contrast to the positivist claim of identifying rule like laws of cause and effect on the level of events by discovering a relationship between independent and dependent variables (Carter & New, 2004). In turn, critical realists reject objectivist's conflation of levels and reductionism, meaning that the problem is reduced to the smallest elements (Holden & Lynch, 2004; Miller & Tsang, 2010).

Critical realist philosophy requires specific construct, internal and external validity evaluation compared to a positivist posture. In realist terms construct validity is characterized by the fact that empirical traces can be related to actual events under study rather than to – what positivists posit –theoretical ideas (Johnston & Smith, 2010). Thus, construct validity cannot be assessed by statistical analysis but has to be

linked to what is occurring in another ontological domain. However, linking empirical observations with actual events requires discovering the meaning of the data (Johnston & Smith, 2010). Internal validity according to critical realism is tested in controlled environments and is achieved if the occurrence of actual events can be explained by the generative mechanisms purported by theory. Johnston and Smith conclude that testing in critical realist terms is explanation on three levels: First, explaining the mechanism, second, confirming that the mechanism operates as described and third, alternative explanations can be ruled out (Johnston & Smith, 2010). Finally yet importantly, external validity is achieved by assessing if the generative mechanisms working in the controlled environment can be generalized to a broader domain of practice (Johnston & Smith, 2010)

Compared to critical realism, constructivism further continues to subjectivism by negating that a world independent of the researcher exists. Constructivists assume that reality – what we observe – is a social construction of the behaviour of actors in specific circumstances (Mir & Watson, 2001). This leads to a general refutation of the search for true reality, which critical realists try to achieve for example by replicating empirical tests – indicated by the term 'critical'. The key critique constructivists express is that realists are unable to consider all potential linear and non-linear causalities and thus, as a potentially infinite number of causalities exist, realists' search for a replicable reality is infeasible. Constructivists therefore demand, based on the concept of 'overdeterminism', that only a few factors or 'entry points' of interest for the research question in scope can be discovered and thus existing theories can be limited and made more effective in their confined sphere of influence (Resnick & Wolff, 1987; Mir & Watson, 2001). In turn, the research process, especially determining entry points becomes inescapably political (Mir & Watson, 2001). In constructivism, knowledge is generated by researcher and respondent interaction, which leads to a better understanding of the similarities, and differences existing in the constructions of reality both hold (Riege, 2003)

From the above-described research philosophies, critical realism is most appropriate for this research project for several reasons. First, it allows evaluating what Popper called the third, largely autonomous world of abstract things born by the mind of people (Perry, Riege, & Brown, 1999; McGee, 1985). In consequence, abstract questions such as 'what is it about this implementation that works for whom in what circumstances' can be analysed (Dobson, Myles, & Jackson, 2007). This fits the research objective

of this thesis of 'how consistent concepts of HS are established and sustained'; or more precisely, 'which common activities, capabilities and resources do firms need to elaborate for implementing and operating HS'. As however, the generative mechanisms are operating beneath the empirical surface on an actual and real level, other research paradigms such as positivism are not capable of identifying them. This however is mandatory, as the thesis attempts to develop a theory of mechanisms, working in conjunction on various levels of reality, such as the composition of a firm's activity system and activities, or its activity drivers, and its stock of capabilities and resources. Likewise, assumed that these mechanisms exist independent of subjective perceptions of agents, constructivism lacks the explanatory power to explain these phenomena. Second, critical realism corresponds to the level of analysis of key theories, such as the RBV, applied in answering the research question. RBV assumes that competitive advantages result from idiosyncratic, firm specific resource and capability configurations. In this view, a resource's value depends on its inimitability, which in turn is a function of its unobservability. In this vein, also a firm's activity system and its activities are unobservable. Attempting to explore unobservable generative mechanisms working beneath the empirical surface, however, restricts the use of possible epistemologies. Strict positivists neglect a scientific inclusion of unobservables in knowledge generation per se. Contrary, instrumental positivists accept the theoretical use of unobservable variables, but negate the deduction of normative statements for managerial action as several alternative theories can predict the phenomenon observed. Accordingly, in an instrumentalist view a theory's value rests only on its ability to explain empirical reality. Common to both of these positivist philosophical stances is the collapse of assessing and measuring a theory. By doing so, however, the measurement of a theory is equated with its relevance in explanation. This may hold for physical sciences with a low degree of unobservables, but leads to, what Hayek calls 'scientific error' in social sciences characterized by theories incorporating unobservable variables (Hayek, 1989). Following a critical realist stance can avoid this scientific error by breaking up the connection between measurement and relevance through separating the testing of generative mechanisms and the empirical analysis of observable effects created by generative mechanisms (Godfrey & Hill, 1995). Third, while subjectivists' 'attempt to minimize the distance between the researcher and that which is being researched' leads to a deep understanding of a problem in its contextual setting; it, however, obscures the research question for the meaning individuals attach to a given situation (Hussey & Hussey, 1997, p. 49; Easterby-Smith, Thorpe, & Lowe, 1991). In consequence, the search for underlying mechanisms is from a subjectivist stance pointless as causes and effects are 'phenomena engaged in a process of continuous

creation' (Hirschman, 1986). Beyond that, critical realism's 'inherently pluralist and flexible' logic of enquiry allows combining multiple perspectives such as qualitative and quantitative or prospective and retrospective methods. Last but not least, realist epistemology 'engages stakeholders systematically as experienced but nevertheless fallible experts' providing a window to reality, which needs to be documented, formalized, reflected upon and validated within complex, multi-level explanatory models (Dobson, Myles, & Jackson, 2007). For that reasons, the limitations of critical realism of restricted reproducibility, limited generalizability and conclusions remaining fallible, incomplete and extendable are accepted for the above explained benefits (Dobson, Myles, & Jackson, 2007).

B. RESEARCH METHOD

Critical realist research is rare in the field of management and marketing (Riege, 2003). A 2012 online analysis of the most renowned four strategic management journals (Macmillan, 1989; Macmillan, 1991), the academy of management journal, the academy of management review, the administrative science quarterly and the strategic management journal, found only four articles including 'critical realism' or 'critical realist' in its title or abstract. Thereof, three focus on general philosophical considerations and one tests the theory of behavioural assumptions of transaction cost economics (Tsang, 2006).

A cause for critical realism's limited use in strategic management is its objective to uncover deep and unobservable structures of reality typically demanding for qualitative methods (Guba & Lincoln, 1994). Management researcher, however, seem to be reluctant in applying qualitative methods regarded as less rigorous alternatives to well established and broadly applied quantitative methods. From an analysis of PhD dissertations in six fields, Adams and White conclude that there is a strong predisposition for quantitative research and critique such a 'mindless empiricism' for its unjustified elimination of case study dissertations (Adams & White, 1994). Especially as case study analysis is a rigorous and analytical procedure able to produce generalisable results (Downard, Finch, & Ramsay, 2002; Perry, 1998; Yin, 1994). This differs, however, from other disciplines such as geography, economics, organization theory, sociology, international relations or entrepreneurship more accustomed to qualitative methods (Riege, 2003; Adams & White, 1994). Thus, these fields are used for transferring knowledge to the field of strategic management and this research in particular (Mingers, 2000; Dobson, Myles, & Jackson, 2007). Another reason is that theorizing in critical realism is to propose generative mechanisms that explain events and require retroduction as a specific mode of enquiry (Miller & Tsang, 2010). The search for generative mechanisms marks the key difference to induction or deduction as it allows generalizing beyond the em-

pirical occurrence of specific phenomena. While induction tries to generalize from a particular event, deduction is predicting outcomes from a general theory (Saunders, Philip, & Thornhill, 2009), retroduction aims at explaining events by postulating and identifying mechanisms capable of producing them (Miller & Tsang, 2010; Sayer A. , 1992). Thus, retroduction 'involves moving from a conception of some phenomenon of interest to a conception of a different kind of thing (power, mechanism) that could have generated the given phenomenon' (Lawson, 1997, p.236). Identifying and measuring the working mechanisms in certain situations as well as testing for conjunctions of mechanisms as explanations for empirical outcomes characterizes methods used in critical realism (Miller & Tsang, 2010). While critical realism offers researchers to choose relatively free on methods dependent on the nature of the object of study and what he wants to learn about it, it lacks clear guidance for empirical work, especially in respect to qualitative methods (Miller & Tsang, 2010; Danermark, Ekström, Jakobsen, & Karlsson, 2002; Sayer A. , 2000; Downard, Finch, & Ramsay, 2002).

Qualitative methods used in critical realism range from more theory building in-depth and convergent interviews to focus groups over case studies to more theory testing surveys (Healy & Perry, 2000); with an emphasis on theory building in new research areas requiring more understanding before theory testing can be done (Miles & Hueberman, 1994). While the main objective of case studies is theory development and construction, in-depth interviews focus on obtaining detailed information, convergent interviews narrow the research focus, focus groups concentrate on group interaction and surveys provide the basis for quantification (Riege, 2003; Healy & Perry, 2000; Yin, 1994). Qualitative methods also differ in terms of prior theory requirements (Riege, 2003; Yin, 1994). While case studies require medium to high levels of prior theory, interviews or focus groups do not. This is similar for structure; while case studies typically are structured or at least semi-structured and follow a standard procedure; other qualitative methods are more flexible. Additionally, each of the qualitative methods generates different advantages. Whereas case studies and interviews are replicable, convergent interviews have strength through their progressiveness and iterative nature. Focus group's advantages result from synergistic effects in a group setting (Riege, 2003; Yin, 1994).

Of all presented qualitative methods, realism fits especially well with case study research as both assume an external reality independent of the researcher, however requiring the researcher to study the deeper structures of the empirical observation (Tsoukas, 1989). Realism is the preferred paradigm for case

study research, especially if the case study areas are contemporary and pre-paradigmatic (Perry, 1998). This way, case studies allow theory building by comparing and searching for similarities and differences within the collected data (Neuman, 2005). This provides a basis for confirming or disconfirming a theory's elements, its constituting categories and the relationships among them and thus, sharply contrasts to quantitative approaches of testing theory for generalizability to a population (Perry, Riege, & Brown, 1999). Additionally, case studies as flexible design approaches permit theory and data to interact particularly in early stages of the research project (Neuman, 2005). This allows, typically incrementally, changing key parameters of the study during the course of the study and may lead to merge data collection and data analysis phase (Runeson & Höst, 2009). In addition, case studies in critical realism are *instrumental* in trying to understand something else than the case, which is the world beneath the empirical surface. This requires, however, a deep understanding of the investigated phenomena demanding physical and psychological proximity to the phenomenon in order to interpret the respondent's experiences and beliefs in their own terms (Gilmore & Carson, 1996; Perry, Riege, & Brown, 1999). Contrary, *intrinsic* case studies do not comply with critical realist scrutiny, because the centre of attention is the case itself instead of the deeper layers of a stratified reality (Healy & Perry, 2000).

Moreover, Harper assigns case studies a dual character, meaning that cases are characterized by both, 'situational groundedness and theoretical generality' (Harper, 1992). Thus, a case's general category pre-exists a case's identification, despite being expected to contribute knowledge to that general category (Downard, Finch, & Ramsay, 2002). These knowledge contributions can be incremental by adding details or more categorical by challenging the categorical system upon which it was identified (Downard, Finch, & Ramsay, 2002). Thus, even a single case can discover 'unassailable' causal explanation of a phenomenon, which is possible through '*analytical induction'* or *'logical inference'* (Mitchell, 1983; Downard, Finch, & Ramsay, 2002; Znaniecki, 1934; Mitchell, 1983). Last but not least, case studies' inherent pluralist and flexible enquiries are able to consider multiple perspectives such as prospective and retrospective, formative and summative or qualitative and quantitative (Riege, 2003). It can incorporate data from sources such as direct observation, systematic reviews, and private or public archives (Leonard-Barton, 1990). Thus, case studies can include all data potentially relevant for describing the phenomenon in its context (Stone, 1978). Furthermore, case studies can unveil numerous insights on several levels and perspectives of the organization allowing studying multiple mechanisms working in parallel to actualize phenomena (Leonard-Barton, 1990).

In conclusion, this research applies a case study approach for four main reasons. First, it best fits the chosen research paradigm of critical realism and the pre-paradigmatic research question of underlying HS mechanisms not yet thoroughly researched (Leonard-Barton, 1990; Perry, Riege, & Brown, 1999). Second, case studies can be used as instruments in order to understand something else than the case, which is the world beneath the empirical surface. Third, case study approaches are among the most rigorous of all qualitative methods and provide the necessary 'deep' understanding on 'why' and 'how' questions by engaging various stakeholders systematically in order to uncover patterns of reality (Yin, 1994; Campbell, 1975). By this, a case study provides a basis for a deep understanding of the elements, categories and corresponding relationships of HS. These are the underlying real mechanisms of firm activities, resources and capabilities. Third, findings from case studies allow to challenge the categorical system upon which they were identified through analytical induction. Fourth, case studies provide the potential to elaborate on multiple perspectives and data sources allowing studying mechanisms working in parallel for actualizing events.

Research based on case study method requires three things: First, groundedness in theory, second, systematic research design and third, evaluation criteria for controlling validity and reliability (Johnston, Leach, & Annie, 1999). While these requirements apply to realist case research in general, some specifics are required in addition. Therefore, in the following, differences and similarities are described based on an eclectic comparison of various approaches from a range of disciplines. Variances between the approaches in the different fields are minor and caused mainly by emphasising different or special foci. Easton, for example in the field of industrial marketing, focuses on defining the phenomena through determining the boundaries, describing the objects and entities, their structures and causal powers and liabilities, their connectedness and their relations, the specific research context, the structure of causal explanations as well as the operating generative mechanisms (Easton, 2010). On the other hand, Miller and Tsang, as strategic management representatives, concentrate on system characteristics – open versus closed (Miller & Tsang, 2010). In turn, Johnston and Smith, from an information systems research view, stress validity and reliability aspects of critical realist research (Johnston & Smith, 2010). Lawson and Runde, both from the field of economics, concentrate on the explanatory power for assessing theory (Lawson, 1997; Runde, 1998).

Similarities of the different critical realist research approaches exist on various levels: First, the extent, meaning the start and ending points of critical realist research, second, the sequence of steps included in the approach and third, the content included in each of the research steps. It is necessary to state that despite not all approaches are identical – what is neither expected nor required – common characteristics dominate. Overall, the following four steps can be synthesized: 'identify causal mechanisms', 'test presence of the mechanism in the empirical setting', 'test causal effects of mechanisms under controlled circumstances' and 'assure identified mechanisms apply to phenomena of the broader research domain'. Principally, this is in line with Johnston et al.'s requirements of theoretical groundedness, systematic research design and evaluation of validity and reliability (Johnston, Leach, & Annie, 1999). However, as theoretical groundedness assumes a hypothetico-deductive approach this is substituted by designing a research construct explaining the generative mechanisms working in the real and causing events in the actual and empirical domain. Therefore, the approach for this particular research is starting with developing a research construct guiding and informing the research design. While the research *construct* determines inter alia the boundaries of the research including the entities, the research *design* defines the way the research construct is examined, cases and interviews selected and methods and instruments applied. The case study itself consists of data collection and analysis as well as report writing and includes testing the presence and causal effects of generative mechanisms as well as generalizing these mechanisms to a broader research domain. For all these steps validity and reliability needs to be established. Figure 21 summarizes the research approach, which is further detailed in the following.

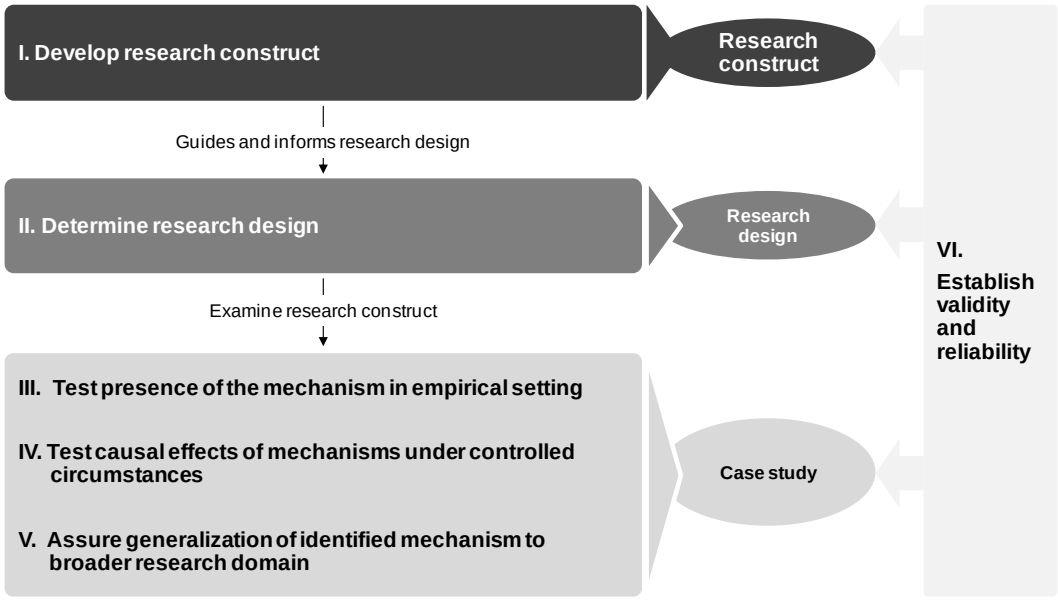


FIGURE 21: CRITICAL REALIST RESEARCH APPROACH

The initial first step is to *theoretically ground the research and identify causal mechanisms*. This step requires interpretive work at the interface of theory and empirical context in order to resolve theoretical ambiguities and derive implications for particular settings (Miller & Tsang, 2010). The goal is to achieve a contextualized specification of the explanatory properties and processes underlying hypothesized causal relations (Runde, 1998). Inferring consequences and effects form mechanisms is done using retroduction (Lawson, 1997). It is essential to select those mechanisms, from the potential amount of complementary or conflicting mechanisms proposed by a theory, which are believed to operate in a particular research setting (Miller & Tsang, 2010). This is done by identifying the underlying activities, capabilities and resources of HS. From this, hypotheses are developed on how the purported generative mechanism will actualize itself and which empirical traces can be observed (Johnston & Smith, 2010). Besides mechanisms, also entities and objects possessing causal powers and liabilities characterize phenomena. Thus our abstractions, meaning particular one-sided components of the concrete object, can cause problems if objects are divided if they are indivisible or conflated if they are separable (Sayer A. , 2000, p. 19). This requires a proper definition of entities and objects in addition to mechanisms. All this is done in the research construct including the boundary and scope definitions of this research.

A second step is to determine research fundamentals such as objectives, data sources, methods of data collection and tools of analysis in *research design*. Accordingly, in the design phase data collection, analysis and report writing is prepared. However, due to the flexible design of case studies these phases frequently conflate.

The empirical section of the case study starts with testing the *presence of the mechanism in the empirical setting* (Miller & Tsang, 2010). This assures that the mechanism is 'causally active' (Runde, 1998). However, as Lawson indicates, "… there can be no guarantee that any effects will be straightforwardly manifest … the aim must be to try and identify conditions … where the effects ought in some way to be in evidence" (Lawson, 1997). This can be done by collecting evidence that the empirical data collected is "generated by, and described in an adequate form (for the purposes of the research), the actual events of interest that operate below the empirical surface" (Johnston & Smith, 2010, S. 43). However, as the actual is larger than the empirical domain, a purely empirical analysis is not feasible, rather requiring a theory-laden, or at least conceptually mediated, determination of meaning (Sayer A. , 2000). Even if it is impractical to directly observe mechanisms, observable effects – its empirical traces – allow inferring its pres-

ence. In this line of argumentation, a mechanism's existence is compelling if many effects can logically attributed to it.

Another step in data collection and analysis is to *test the causal effects of mechanisms under controlled circumstances in a 'natural laboratory'* meaning in isolation of other effects (Miller & Tsang, 2010). In this research the natural laboratory testing theoretical propositions is the focal firm (Godfrey & Hill, 1995). This contrasts sharply to the common pattern in strategic management, typically testing hypothesized relations to dependent variables directly (Miller & Tsang, 2010). Similar to hypothetico-deductive methods, however, empirical data is analyzed in regards to whether the events empirically revealed are in accordance with the events purported by the theorized generative mechanisms (Johnston & Smith, 2010; Lawson, 1997). In order to prove this, explanations need to be deep, meaning that the factors included should not be obscured by other event related factors (Runde, 1998; Downward, Finch, & Ramsay, 2002). This causes a need to be 'sufficient' in regards to the interest of the research (Runde, 1998; Downward, Finch, & Ramsay, 2002). This fourth step requires eliminating alternative possible mechanisms. Finally, the *identified mechanisms in the 'natural laboratory' are tested for applying to phenomena of the broader research domain* (Johnston & Smith, 2010). The 'closed system' assumption of step three is important to create 'the conditions for the effective triggering of casual mechanisms, such an opportunity exists not in social world' (Pawson & Tilley, 1997, p. 150; Healy & Perry, 2000). Therefore, the entire theoretical system is tested and complexity, for example by assuming an open systems character, is added to the evaluative procedure. The goal is to control if the theory's mechanisms are sufficient to explain the outcomes. In case of complex theories this might not be feasible in a single study. In such cases, subsets of mechanisms can be designed that are unbiased by omitted theoretical variables. This, however, requires research settings in which the omitted variables can be assumed to be invariant or irrelevant (Miller & Tsang, 2010). At least, the treatments, the participants and the 'laboratory' environment are required to be good surrogates for the real-world phenomenon (Johnston & Smith, 2010). Accepting that 'minimum requirement' leads to conflate the last two stages of this research as the 'natural laboratory' is the focal firm. However, instead of testing HS models in laboratory and open system conditions, this research tests the underlying HS mechanisms in 'real' firms against specific types of HS as well as against the synthesized, more general model allowing achieving a higher degree of generalizability.

C. RESEARCH CONSTRUCT

The next figure shows the key activities in determining the research construct, which are further detailed in the following (Johnston & Smith, 2010).

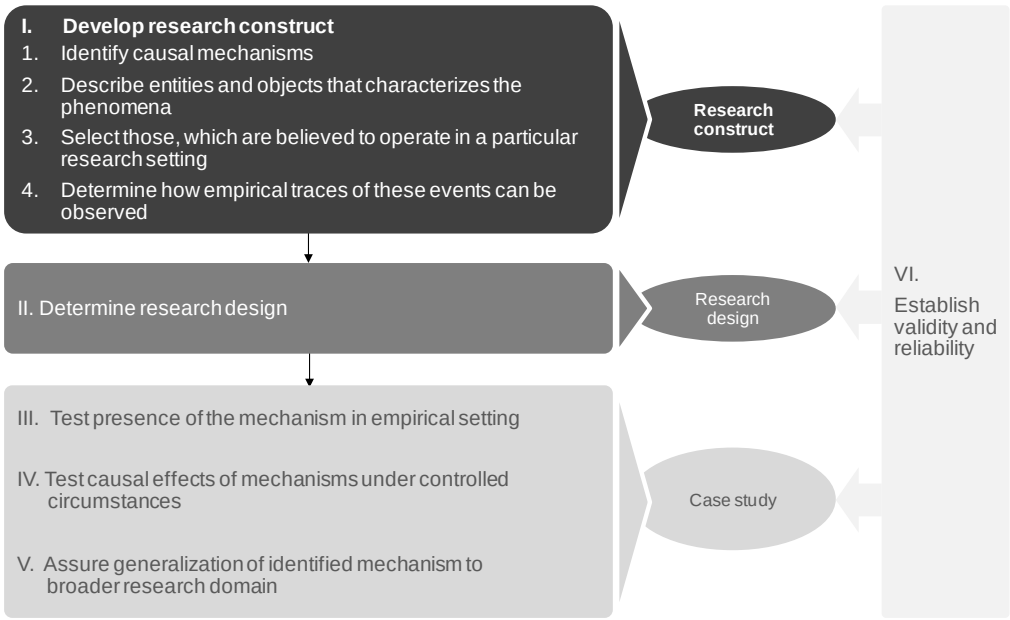


FIGURE 22: RESEARCH KEY ACTIVITIES

Designing a research construct is theory driven. Thus, the ABV takes a central stance in the research construct allowing analysing consistent HS concepts and implementations (Sheehan & Foss, 2007). In analogy to Johnston and Smith the real domain at the centre bottom of figure 23 shows two entities: The industry environment and the firm (Johnston & Smith, 2010). Usually entities are structured with a set of internally related objects and practices (Easton, 2010; Sayer A. , 1992). Thus, industry structure includes a firm's business unit, customers, competitors and partners (Easton, 2010). In this environment, firms are considered real and intransitive as they exist independent of human perceptions of it (Johnston & Smith, 2010). The same holds for the business unit, determining the part of a firm, or in a single business unit firm the firm itself, which takes essential strategic decisions on areas such as product, production and marketing. The business unit comprises a number of other entities, such as departments, people, processes or resources, all conceived real, as they exist independent of human perceptions of them (Easton, 2010). In this research, two entities of a business unit are of certain interest: A firm's activity system and its resource and capability stock. Both assumed real and internally related to each other. The major interest of this research is in discovering consistent concepts and implementations of HS. The relationship between industry environment and the firm, which is characterised by change and adaptability, is external, as the

one is not encompassing the other (Easton, 2010). In this respect, customers are of particular interest as they consider the complete range of competitive products and choose the one offering the highest perceived customer value. Thus, for example, competitive actions are covered by focusing on the customer perspective.

Furthermore, critical realism differentiates necessary from contingent relationships (Sayer A. , 1992). A relationship is necessary if "the object is dependent on its relation to the other", while it is contingent if "it is neither necessary nor impossible that they stand in any particular relation" (Sayer A. , 1992, p. 89). While necessary relations lead to changes of one thing if the other one is adapted, contingent ones may or may not lead to changes. In this line of reasoning, contingent relations are incapable of producing generalizations (Easton, 2010). Nonetheless, for explaining events a combination of both, necessary and contingent relations is required (Easton, 2010). In this thesis, an industry environment cannot exist without firms competing in it and vice versa. This relation is necessary as it derives directly from the nature of the involved bodies and is important for this research as it allows identifying HS underlying generative mechanisms. Furthermore, explaining changes in an industry requires a combination of both, necessary and contingent relations (Easton, 2010). Adequacy, in this context, refers to the impact of firm activities on its competitive environment, which will change independent of a firm adapting its activity system or not. It simply results from external modifications and occurs even if a firm chooses not to adapt its activities in face of environmental changes as effects of continued activities differ in a changed environment (Sayer A. , 1992, p. 140).

As explained before, the focal theoretical point in the purported generative mechanism is *activities*, which engage a firm's owned and controlled resources and capabilities to serve a specific purpose of fulfilling an objective. Thus, *activity systems* are sets of interdependent activities within and across a firm's boundaries (Zott & Amit, 2010, p. 217). Previous research found certain combinations of activities to be more effective than others (Sheehan & Foss, 2007; Allen & Helms, 2006, p. 452). However, activities occur on different levels such as top-level activities of planning, sourcing, manufacturing or delivering or sub-level activities such as manufacturing planning or integrated manufacturing and RD (Davenport, 2005). In terms of strategic implementation, this allows differentiating strategic realizations which are inconsistent across various levels from those seemingly conflicting on higher levels, but are consistent on lower activity levels (Sheehan & Foss, 2007, p. 219). From an ABV perspective, competitive advantage results from "mechanisms through which resources and capabilities get exposed to market

processes where their ultimate value and ability to generate competitive advantage are realized" (Ray, Barney, & Muhanna, 2004, p. 35). Thus, ABV explains how dynamically deploying resources and capabilities generate competitive advantages, while RBV conceptualizes competitive advantage statically by possessing resources and capabilities. Thus, RBV focuses on the prerequisites of competitive advantage or put differently, it elucidates *what are the building blocks* of competitive advantages. In this line of reasoning, resources and capabilities are stocks without having value per se and even can destroy value through additional cost occurring through stocking. Capabilities, on the other side, are converted resources and determine what the potential of the stock of resources is. However, only the actual deployment of the resource and capability through activities generates value. For instance, underemployed labour is a cost-generating stock, which is potentially valuable, if employed to satisfy market demand, but its value is only instantiated if successfully applied in terms of competitive action (Chrisman, Hofer, & Boulton, 1988). Therefore, it is argued from a critical realist stance that on the level of real two generative mechanisms operate firm internally. First, the availability of input – resources and capabilities - necessary for competitive actions explaining the *what* is required for achieving competitive advantage. However, resource transformation is not an end in itself but necessitates a focus on competitive action. Moreover, competitive advantage results from sustainably outperforming the competition or more precisely, from achieving continually higher levels of profit generation, measured as difference between revenues and cost generated by a firm's activity system, than competitors. Consequently, competitive advantage can only be determined relatively to a firm's competition. Thus, the second level is individual or collective activities, bundles of activities or activity systems explaining the *how* competitive advantages are achieved. As *how* and *what* are two sides of the same coin, both need to be aligned consistently. Figure 23 shows both of these internal mechanisms of consistency in the real domain.

In addition to these purely internally driven mechanisms, external ones exist. They work at the interplay of a firm's customers and its activity system. Correspondingly, they are called *activity drivers* and represent 'the underlying source of competitive advantage' (Pearce & Robinson, 2005, p. 104). More specifically, they explain *why* a firm's set of activities is generating more value than a competitor's (Sheehan & Foss, 2007, p. 453). Drivers are used manifold, either in order to manipulate the value chain in terms of cost or differentiation, or in order to improve fit within a firm's activity system (Sheehan & Foss, 2007; Ghemawat, 2006). They are generic and structural in nature, what requires a firm's management to adapt drivers to firm specific needs. Drivers are distinct from resources, as drivers need to be made controllable

by the firm, while resources need to be organized and developed according to the logic inherent in a firm's activity system (Sheehan & Foss, 2007, p. 458). Additionally, drivers are generic, while an activity system is a concrete manifestation of how a firm is doing business. The manifestation occurs on two levels: the individual activity and the collective, overall activity system orchestrating all activities within a firm's internal and external value chain (Allen & Helms, 2006). Despite the unilateral relationship of drivers on collective level, on individual level single activity drivers influence multiple activities and vice versa. In consequence, competitive advantage results from identifying generic activity drivers, interpreting them and firm specifically adapting the activity system and thus triggering the internal mechanisms. Similarly, to internal consistency, external consistency between a firm's market needs and its activities is compulsory for achieving HS. Figure 23 shows this mechanism explaining external consistency or *why HS are achieved*.

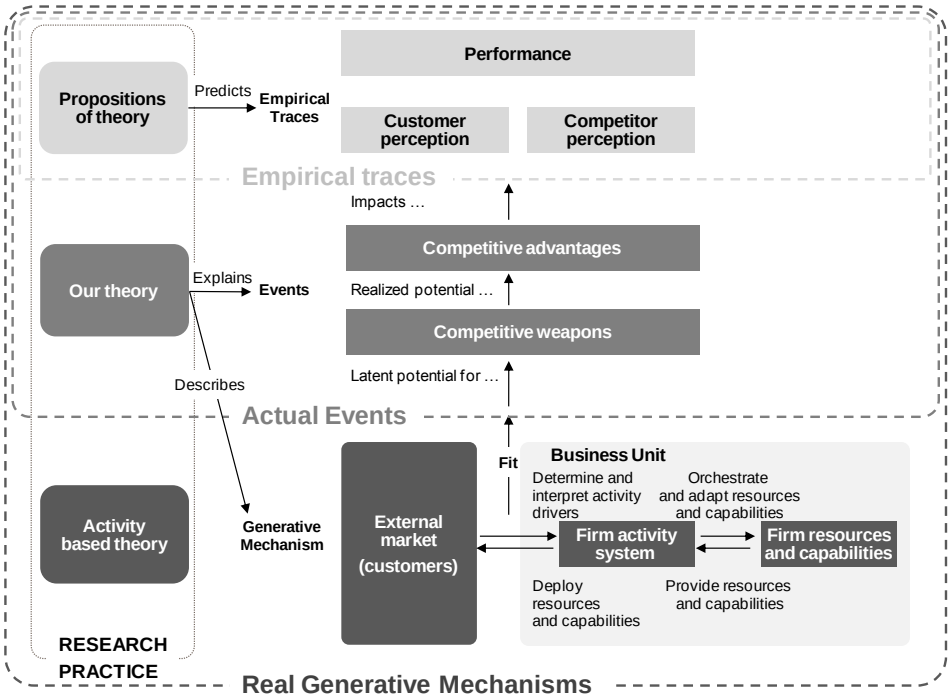


FIGURE 23: RESEARCH CONSTRUCT

Internal as well as external consistency determines the degree of fit between resource and capability deployment and market or more specifically customer needs. Thus, directing a firm's activities and its stock of resources and capabilities to fit generic industry drivers consistently is the task of competitive strategy. More specifically, internal and external *consistency requires a firm's activity system to rebalance* gene*ric drivers with its activities, resources and capabilities*. If a firm's overall mechanism provides dispropor-

tional adaptability the firm suffers – in correspondence to Zajac and Shortell's dynamic fit model – either from 'activity inertia' or from 'excessive activity' (Zajac & Shortell, 1989). In both cases, a firm's resource and capability deployment will not fit market needs leading to inefficient or ineffective use of resources and capabilities.

Mechanisms operating in the real domain generate actual events. Thus, consistent fit or misfit determines a firm's competitive potential. Potential competitive advantages instantiate only if a firm's activity system achieves fit between its deployed resources and its generic activity drivers. Such *potential* competitive advantages or *competitive weapons* are distinct from *actualized competitive advantages* in the sense that while a firm can render the first without realizing the second (Coyne, 1986; Chrisman, Hofer, & Boulton, 1988). An example can illustrate the difference between competitive weapons and advantages. In practice, a firm could achieve a favourable cost position in production - a competitive weapon - through realizing economies of scale - a generic driver - originating from its production facility – a resource - , its production or management capabilities - a capability - and its orchestration and integration in the wider internal or external supply chain – the activity system. Then, a decision *not to* apply the competitive weapon would lead to achieve no competitive advantage. Nonetheless, the firm would ceteris paribus earn a higher profit, but it will gain neither a cost nor a differentiation advantage over its rivals. Contrary, employing its favourable cost position as a competitive weapon for reducing product prices, thus achieving competitive advantage, will provide the firm with a competitive edge over its rivals by attracting for example additional sales. Penrose appraised this difference between the service a resource renders and the resource itself over 50 years ago by pointing out that the one is a resources' latent market potential and the other is the realized market value created through concrete market activities (Penrose, 1959, p. 25). Activity systems of HS firms need to actualize multiple competitive weapons in order to combine competitive advantages. Realized competitive weapons focus either on cost or benefit, or on utility combining both (Chrisman, Hofer, & Boulton, 1988). Thus, the developed HS theory describes the actual occurrence of consistent and simultaneously realized competitive advantages. Figure 24 illustrates this fact in the domain of the actual. In turn, the empirical domain includes observable traces of the actualized competitive advantages in terms of directly measurable performance. Thus, analyzing the empirical level founds the basis for distinguishing competitive advantages from competitive weapons in the actual domain as the first is a concrete manifestation of the second. This is illustrated the empirical domain of figure 23.

D. Research design

The research construct guides and informs the research design or put differently, the specific research design aims at rigorously examining the research construct (Johnston, Leach, & Annie, 1999). For that reason, the case research design needs to find answers for questions such as 'what to achieve', 'what to know', 'and what to study', 'where to seek data' and 'how to collect and analyze data' (Robson, 2002). While the first four questions relate to all case research independent of the research philosophy applied, data collection and analysis need to be adapted specifically to critical realist case research (Miller & Tsang, 2010). Figure 24 shows the required activities, which will be further explained in the following.

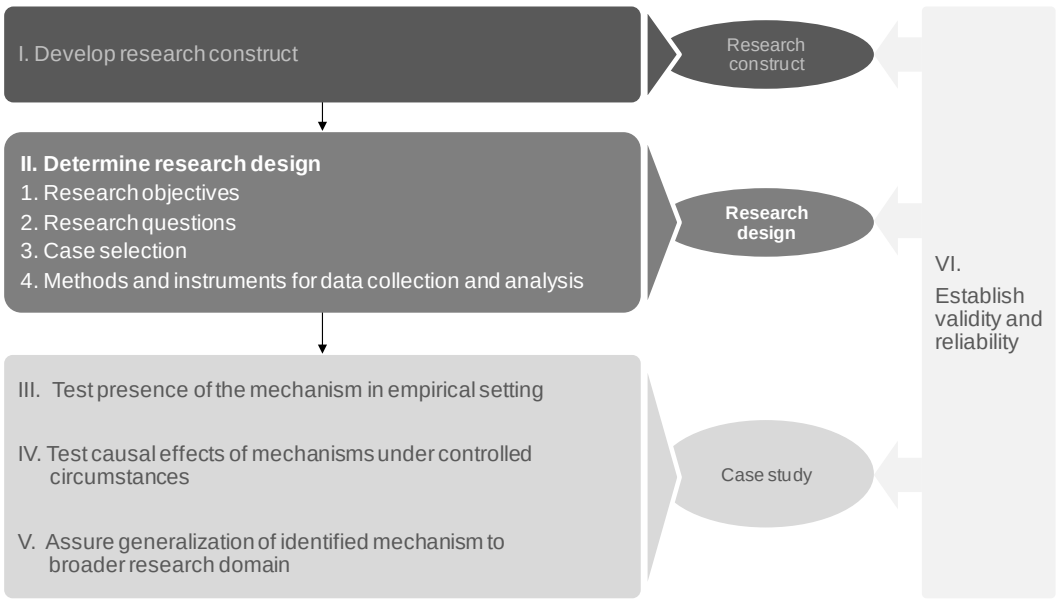


FIGURE 24: RESEARCH DESIGN

D.1. Research objectives and questions

The research objective states what the research expects to achieve, while the set of research questions further refines the objective (Runeson & Höst, 2009). As stated above, this research aims at identifying underlying mechanisms, consistent implementations and common elements of HS.

From this objective the following five research questions derive:

1. Do HS firms apply consistent strategy concepts?
2. Do HS firms consistently implement on activity, capability and resource level?
3. What activities do HS firms apply for achieving external fit with its market demands?
4. What activities do HS firms apply internally for fulfilling these market demands?
5. What resources and capabilities are required for achieving 3 and 4?

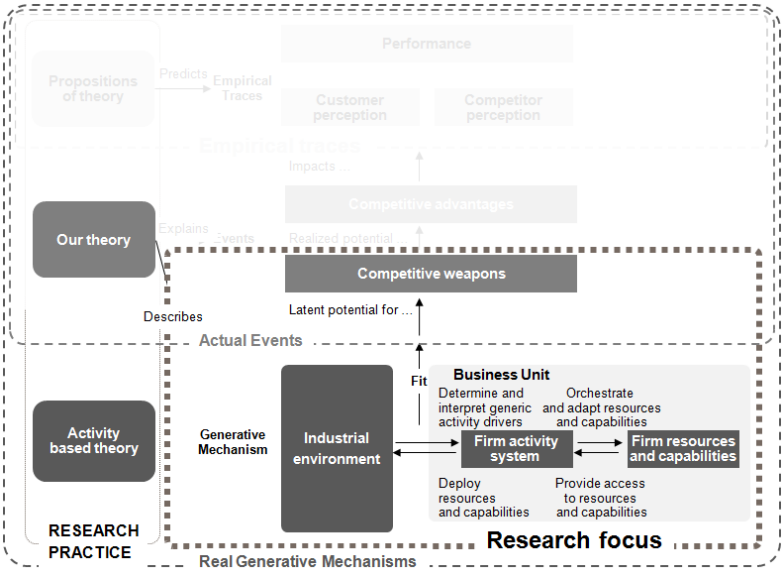
Thereby, the difference of 1 and 2 corresponds to the distinction of intended and emergent strategies (Mintzberg, 1978). Intended strategies are intentionally developed and often implemented accordingly. Nevertheless, consistent concepts are not a prerequisite for consistent implementations as firms may be able to arrange their activities and capabilities consistently without following an intended strategy. The likelihood of success in this case is, however, questionable as no consistent concept guides the development and application of firm activities, capabilities and resources. Thus, it is assumed that 1 and 2 need to be consistently realized.

The difference between question 3 and 4 is one of external and internal focus. While in 3 firm activities are focused on its market or more precisely its customers, in 4 the focus is on aligning activities within a firm's boundaries. Accordingly, activities are distinguished in externally or internally directed, or constitutional if not following an explicit direction. Basis for this differentiation is an activity's main orientation noting that direction is not necessarily exclusive. Resources and capabilities are analogously differentiated, however, considering the activities deploying them in addition (Ray, Barney, & Muhanna, 2004). Thus, in case a resource's and capability's orientation cannot be determined the activity deploying it is used for defining its internal, external or constitutional focus.

As the research construct is used for answering the above described research questions, the scope needs to be clearly determined. This research concentrates on identifying common elements namely activities, capabilities and resources applied for combining competitive weapons. This explains the real building blocks and mechanisms underlying HS and requires to preselect firms by their exceptional performance. Consequently, mechanisms in the empirical and actual domain of reality are excluded as otherwise the argument would be circular. Why? As it would be argued that the underlying mechanisms of a preselected firm are responsible for its success, while however the success of this firm was the criterion for selecting

it in the first place. Or put differently, this research presumes that firms included in this research actualized multiple competitive advantages indicated by their empirically evident performance used for selecting them. Consequently, this research concentrates on ‘what activities, capabilities and resources on the real level provides firms with multiple competitive weapons on the actual’ rather than ‘how firms apply these weapons for actualizing advantages driving performance’. Therefore, this research is neither analysing the extent of competitive advantages on the actual level nor the extent these competitive advantages drive performance on the empirical level. Rather, this thesis derives from the existence of these effects that the predicted mechanisms operate on the actual and real. In summary, this research intends to identify generative mechanisms and common activities, capabilities and resources of HS on the real level.

In particular, the focus is on three distinct real mechanisms allowing generating competitive weapons potentially applicable in competition. First, the internal mechanism of exposing a firm’s resources and capabilities to market processes realizing their value and ability to generate competitive advantage. This explains ‘how resources and capabilities are applied to achieve competitive potential and ‘what are the underlying building blocks used for achieving this potential’. Second, the external mechanism responsible for adapting a firm’s activity system and its stock of capabilities and resources to an industry’s generic activity drivers answering ‘why a firm’s internal mechanisms are generating more value than competitors’. Finally, the (re-)balancing mechanism of identifying adaptation needs and of achieving fit of a firm’s activity system with the industry’s activity drivers. The last mechanism is important only in dynamic situations, as otherwise balancing is irrelevant. However, from a dynamic point of view adaptations are vital allowing adapting internal activities, capabilities and resources to external needs. This, in turn, can explain why some firms fail despite possessing all prerequisites in terms of activities, resources and capabilities for successfully competing in a market. However, this mechanism at least partly overlaps with the previous argument of consistent concepts providing the basis for achieving fit with external market needs. In the same line of vein, two other mechanisms are excluded: First, the application mechanism applying weapons in order to achieve competitive advantages addressing the question of ‘what kind of competitive advantages firms apply in the market field’ and second, the conversion mechanism transforming competitive advantages in empirically measurable financial and non-financial firm performance. Figure 25 illustrates the research focus on real generative mechanisms.



Identifiable mechanism	Description	Explanation
Internal mechanism	Exposing a firm's resources and capabilities to market processes realizing their value and ability to generate competitive weapons	Explains how resources and capabilities are applied to achieve competitive weapons? Answers what describes the building blocks used for achieving competitive potential?
External mechanism	Adapting a firm's activity system and its stock of resources to an industry's generic activity drivers	Determines why a firm's internal mechanisms are generating more value than a competitor's?
Balancing mechanism	Identifying and determining (re-) balancing requirements for achieving fit between a firm's activities and its industry's activity drivers	Determines when the potential of a competitive weapon is actualized?

FIGURE 25: RESEARCH FOCUS ON REAL GENERATIVE MECHANISMS

D.2. CASE DETERMINATION

D.2.1. NUMBER OF CASES

For answering the above stated questions, it is important to identify appropriate cases for analysing. Yin defines a case as being anything, which is a contemporary phenomenon in real-life context (Yin, 1994). In this particular research, a case is the strategic business unit of a firm or a single business unit firm, which is the entity taking strategic decision. However, of interest for this particular research is not the business unit in its entirety, rather it is, as explicated in the research construct, a business unit's activities, capabilities and resources. As a business unit's operations typically are embedded in an industry, the research context is a business unit's competitive environment with a particular emphasize on a firm's customers.

As indicated by the above stated research questions, identifying the underlying mechanisms of HS requires in-depth analysis. This can be achieved either by cross- or intra-industry analysis, ideally combining both analysis types (Godfrey & Hill, 1995). Intra-industry analysis of in-depth strategy orientation,

however, is hard to achieve, as many firms are reluctant to disclose confidential information in intra-industry studies including close competitors. Thus, as information richness is a key criterion for in-depth analysis of generative mechanisms, a cross-industry analysis is applied ((Patton, 1990, p. 181). This is supported by above findings from literature review indicating that in each industry only a limited number of firms has successfully implemented HS. Therefore, it is important to identify these firms within each industry ex ante. In addition, applying such an approach can substitute the intra-industry variation in strategic properties by cross-industry examination (Runeson & Höst, 2009).

There is no ideal number of cases and interviews required in a multiple-case study, rather, "the validity, meaningfulness and insights generated from qualitative inquiry have more to do with the information-richness of the cases selected …" (Patton, 1990, p. 185; Eisenhardt, 1991). Perry determines an accepted range from two to four up to 12 to 15 cases and three to four interviews (Perry, 1998). In this research, interviews are used for direct data collection, while archival analysis of internal and external data is used for summary firm profiles. As the focal point of this research is activities embedded within a firm's overall activity system comprising all functions of a firm, data collection requires to cover different perspectives (Porter, 1996). Thus, the range of interviewees should cover multiple levels and functions of a firm's activities allowing gathering both an intentional management view and an operational perspective on what is strategically important (Mintzberg, 1978). In addition, this can provide broad and deep insights on the phenomenon under investigation.

The form of case study applied is instrumental and confirmatory (Healy & Perry, 2000; Perry, 1998). Instrumental as the case targets to understand something different then the case itself - the generative mechanisms producing actual events leading to superior, empirically measurable performance of HS (Stake, 1995). Confirmatory, as prior theory is used as a source of additional evidence providing the basis for theory advancement (Miles & Hueberman, 1994).

Furthermore, replication logic is applied meaning 'two or more cases should be included within the same study precisely because the investigator predicts that similar results or replications will be found. If, indeed, such replications are found for several cases, confidence in overall results increase. The development of consistent findings, over multiple cases and even multiple studies, can then be considered a very robust finding (Yin, 1994, S. 34). Literal replication is expecting similar results for predictable reasons and is used to understand 'deep' similarities (Yin, 1994). Contrary, theoretical replication is predicting different results for predicted reasons (Yin, 1994). As the focus of this research is on discovering com-

mon underlying mechanisms of HS allowing combining competitive advantages literal replication is applied. Following Patton's case selection principle, within case studies' information richness leads to focusing on literal replication and in turn limits the number of research cases studied (Patton, 1990, p. 181). Consequently, the sample of hybrid competitors included in this study is preselected purposefully and homogeneously (Eisenhardt, 1991; Perry, 1998).

D.2.2. SELECTION OF CASES

For selecting the 'right' cases – meaning firms applying HS – answers to three questions are required. First, what are the key selection criteria, second, what information is required and third, how the required information is collected? For reasons of comparability, a review of the existing literature on HS is the basis for answering all three questions. Figure 26 presents an overview on the results of this review.

Performance measures	Performance Indicator	Amount of usage	Description
Performance evaluation *(n=26)*	External data	52	In general, purely objective (or quasi-objective) performance measures are applied; in 20 empirical papers 11 different performance measures based on external data applied 52 times
	Self-reported data	23	In five empirical papers nine different self-reported performance measures applied 23 times
Performance categories *(n=26)*	Financial performance	26	26 papers applied financial performance; thereof 8 focused purely on financial performance
	Market performance	18	18 of the 26 papers combined financial and market performance; none purely relied on market performance
	Shareholder performance	0	Not applied in HS performance analysis
Financial performance measures *(n=46)*	Return on invest	21	15 papers measured 17 times with external data; two papers measured four times based on self-reporting
	Return on assets	7	Five external and two self-reported measurements
	Revenue / profit	6	Twice measured by external data and four times as self-reporting
	Price	5	Generally measured by external data, either as price-cost margin or as price relatively to competitors
	Cost	5	Generally measured by external data as relative figure of cost compared to competitors
	Return on equity	2	One external and one self-reported measure
Market (growth) performance measures *(n=29)*	Sales growth	10	In general, growth figures averaged 3-10 years; six external and four self-reported information
	Market share	7	Four external (twice relative and once absolute market share gain); three self-reported
	Return on sales	5	Three based on external data and two self-reported
	Market growth	4	Three based on external data and one self-reported
	Employee growth	3	One based on external data and two self-reported

FIGURE 26: OVERVIEW EMPIRICALLY APPLIED PERFORMANCE INDICATORS

Criteria for selecting cases

While in academia a broad consensus exists, that performance is at the heart of the field of strategic management, there is dispute on how performance should be measured (Allen & Helms, 2006; Venkatraman & Ramanujam, 1986). One of the most profound ways of classifying business performance is to shed light on the state of competitive advantage and how it is gained (Day & Wensley, 1988). Thus, performance superiority is the outcome of positional superiority, whereby positional advantage results from relative superiority of a firm's activities and its skills and resources (Day & Wensley, 1988). Apply-

ing this view has several consequences for selecting cases worth researching. First, *sustaining superior profitability* is an indicator of owning a positional advantage. The underlying logic is, if competitive advantage leads to increased performance, firms combining multiple competitive advantages should achieve superior performance (Karnani, 1984; Kim & Lim, 1988). This determines the sine qua non condition of HS. Applying this logic in reverse, however, leads to invalid conclusions, as the highest performing firm in an industry not necessarily needs to apply HS; rather it is possible that a single strategy focus firm outperforms its also only toward one competitive advantage oriented competitors.

Underlying the measurement of business or organizational performance are two concepts with 3 approaches: First, subjective concepts with either a target or a constitutive approach and second, an objective concept with a systems approach. While companies perform well in the target approach by achieving self-set objectives, companies in the constitutive approach perform well - based on the stimulus-contribution theory – if the incentives set by the firm are sufficient to generate intended activities of organizational participants (Etzioni, 1964, p. 8; Bühner, 1977, p. 51; Mansfield, 1986, p. 26; Hall, 1982, p. 286). Contrary, the systems approach as an objective performance measurement approach centres on the relationship between a firm and its environment. Thus, a firm performs well if it sustainably survives by securing its sources of competitive advantage (Miles R. H., 1980, p. 367; Jenner, 1999, p. 238). Thus, the systems approach covers the important interaction between a firm's activity system and its resources and capabilities on the one side and its market on the other hand.

The literature review reveals 26 empirical papers explicitly using performance as the dependent strategy variable. All of them apply either objective or quasi-objective performance concepts. Quasi-objective performance information is eliciting specific objective performance information through self-reporting techniques (Richard, Devinney, Yip, & Johnson, 2009). For reasons of comparability with previous research on HS this research applies a system based approach incorporating objective performance criteria for selecting cases.

Information requirements for identifying HS firms

One way of classifying business performance is to distinguish the three domains of financial, operational or non-financial performance (Venkatraman & Ramanujam, 1986). Financial performance is the most prevalent approach for measuring the strategy-performance link, which might be rooted in the domi-

nance of positivistic research in the field (Richard, Devinney, Yip, & Johnson, 2009). Operational performance, reflected in more recent strategy research, includes indicators in categories such as market-share, new product introduction, marketing effectiveness, leadership, management of people or customer focus leading to financial performance (Venkatraman & Ramanujam, 1986, p. 804; Samson & Terziovski, 1999, S. 396). Non-financial performance is by far the broadest measure and reflects 'the multiple and conflicting nature of organizational goals and the influence of multiple constituencies' (Venkatraman & Ramanujam, 1986, p. 804). This approach, however, faces problems arising from considering multi-perspective and corresponding performance measures. This might be the reason, why most strategy studies favour financial and operational measures either individually or in combination. This corresponds to Richard et al.'s performance dimensions of encompassing financial, market and shareholder performance (Richard, Devinney, Yip, & Johnson, 2009).

While financial performance includes measures such as profits, return on investment, return on assets or return on sales, market performance relates to measures such as sales, market share, and price or cost. Indicators for shareholder return are for example total shareholder return, economic value added or Tobin's q.

The following analysis clusters performance measures as financial if accounting standards have a severe impact on their evaluation and as market measure if this is the case only to a limited extent. More specifically the results of Richard et al.'s factor analysis is used allocating measures such as profit margin, return on assets and return on capital employed to one factor which is referred to in the following as financial performance measures (Richard, Devinney, Yip, & Johnson, 2009). Thus, the following performance measures used in HS literature are assigned to financial performance: 'return on invest', 'return on assets', 'revenue and profit', 'price' and 'cost' as well as 'return on equity'. Despite being financial performance related, 'return on sales' is assigned to market performance as the indicator significantly and strongly loaded in Richard et al.'s factor analysis to the same factor as 'sales growth' (Richard, Devinney, Yip, & Johnson, 2009). Thus, the market performance category includes in this research 'sales growth', 'market share', 'return on sales', 'market growth' as well as 'employee growth'. Figure 27 shows the corresponding performance clusters.

In general, all 26 empirical papers on HS applied financial performance measures, with 8 papers exclusively focusing on it. Thus, the majority of 69% of all papers combined financial and market performance. One reason for combining both figures could be the time horizon of financial performance measures,

which is generally shorter than that of market measures leading to potentially lagging the long-term orientation of a firm's strategy and its underlying activities and capabilities (Rowe & Morrow, 1999; Fisher, 1995). Furthermore, combining financial and market performance can balance distortions occurring from applying accounting standards influencing financial performance and compensating for the retrospective orientation of accounting measures (Jacobson, 1987).

With 15 papers using 17 times 'return on invest' – including its derivatives 'return on invest instability' and 'cash flow return on invest' – 'RoI' is the most often used performance indicator across categories. RoI is measured in 88% of all or in total 15 analyses using external data and only in two cases analysing four self-reported figures. Furthermore, 'RoI' was used as an indicator in papers ranging from 1983 to 2011, making it the longest applied financial performance measure in this analysis (Phillips, Chang, & Buzzel, 1983; Claver-Cortés, Pertusa-Ortega, & Molina-Azorín, 2011). For 'return on assets' this relation decreases to 71% or 5 cases applying external data vis-á-vis 29% or two self-reported measures. The following two performance measures, 'price' and 'cost', are applied each five times and are exclusively measured using external data. This is the main reason for including them in the financial performance category. A combination of both occurred in only three cases (Wright, Kroll, Tu, & Helms, 1991; Zeithaml & Fry, 1984; Phillips, Chang, & Buzzel, 1983). Finally yet importantly, 'return on equity' is applied in only two or 10% of the cases based once on external and once on self-reported figures (Kim & Lim, 1988; Parnell J. , 2011). While in no case 'RoI' is combined with 'RoE', it is combined twice with 'RoA' (Yamin, Gunasekaran, & Mavondo, 1999; Beal & Yasai-Ardekani, 2000). This potentially presumes a substitutional relation between the different return indicators as including one type leads to excluding the other.

In 12 researches 17 market performance indicators were applied based on external data. In the remaining five studies 12 self-reported market performance measures were used. Market performance indicators include the second most applied performance data, which is 'sales growth'. 'Sales growth' was measured in 60% of the cases by external data with the remaining representing quasi-objective self-reported information. Thus, it marks with 34% the top market performance information empirically applied. In the 17 studies applying market performance indicators 'sales growth' was in almost all cases included. The only two exceptions are cases applying 'return on sales' seemingly using it as a substitute (Bowman & Ambrosini, 1997; Acquaah & Yasai-Ardekani, 2008). Considering 'return on sales', accounting individually for 17%, sales oriented indicators total more than half of all market performance indicators (52%). In

24% of all empirical analyses applying market measures ‘market share’ is used. The remaining two indicators ‘profit growth’ and ‘employment growth’ are used in 14% and 10% respectively of all studies applying market performance indicators.

Based on this analysis, this thesis applies a systems approach deploying objective or quasi-objective performance measures. Furthermore, it adopts a combinative approach for measuring financial and market performance for identifying firms applying HS. For reasons of comparability, the most often used financial and market performance indicators are deployed. Thus, for measuring financial performance, ‘RoI’– substituting ‘RoA’ and ‘RoE’ – and revenue and profit are adopted. In turn, ‘sales growth’ and ‘market share’ are selected for measuring market performance.

In addition, as indicated by the term ‘sustained’ a longitudinal perspective is required. The literature review on HS reveals an average period of 3.8 years with a median of 4 years. Analogously, this research exercises a 4 years average period for collecting data on financial and market performance.

Furthermore, measuring positional advantage and correspondingly performance necessitates a relative stance including a firm’s competitive environment. As the review on HS literature reveals, all performance figures applied were related to either a firm’s overall industry or an industry segment. One paper, for example, relates performance figures only to the three largest competitors of the firm (Zeithaml & Fry, 1984; Phillips, Chang, & Buzzel, 1983). Similarly, this work determines performance – data availability assumed – in relation to a firm’s overall industry. Otherwise, if overall industry data cannot be detected, performance related to a firm’s two or three main competitors is considered sufficient as well.

In order to further operationalise and measure business performance Snow and Hambrick differentiate four approaches (Snow & Hambrick, 1980; Nandakumar, Ghobadian, & O'Regan, 2011). First, investigator inference in which the researcher interacts with members of the organization, while simultaneously uses all available external information. Second, self-typing in which senior members of the organization are asked to characterize their strategic orientation. Third, external assessment confirming the self-typing measures by individuals outside the organization. Finally yet importantly, objective indicators based on published data and not influenced by subjective perceptions of internal organizational members or external experts.

The analysis of empirical HS literature revealed that either external available data or self-reported estimations from firm key informants are the basis for objectively measuring performance. Papers published before 2004 exclusively uses external data elaborating in total 11 external measures applied in 15 papers 45 times. Only five more recent papers applied nine different self-reported performance measures 23 times.

Next, firms applying HS are identified and selected through a quantitative industry analysis. This is based on the assumption that HS generate superior profitability. Thus, the initial analysis is based on external primary and secondary data for identifying outperforming competitors in each industry. As however, the number of firms within an industry applying HS is limited – a fact confirmed by the literature review – a cross-industry approach is required for achieving a reasonable number of cases.

INFORMATION COLLECTION AS BASIS FOR SELECTING HS FIRMS

In June 2013, data in Germany, Switzerland and Austria were collected for firms belonging to either stock indices of DAX, MDAX or SMI, or 'hidden champions' (Simon H. , 2012). Hidden champions share three characteristics: First, they are globally among the top three or regionally the top competitor in terms of market share. Second, revenues below 5 billion Euros and third, low public profile compared to larger stock traded companies (Simon H. , 2012). While the first criterion coincide with the key indicators used for identifying hybrid potential, the latter two explain the inclusion of hidden champions next to large stock traded companies.

In total 163 companies composed of 30 DAX, 50 MDAX, 20 SMI firms and 98 hidden champions were included in the overall sample of firms. While data from Bloomberg was used to evaluate hybrid characteristics of stock traded companies, Factiva was used for medium sized firms. Due to the subprime mortgage crisis in the U.S. starting 2007 and its consecutive European economic crises, banks were excluded as hybrid characteristics were most probably not identifiable due to macroeconomic noise in the data. In addition, for most of the hidden champions, data were not or not fully available for all indicators across the four years period covered in this analysis. However, hidden champions fulfil 'per definition' – regionally market dominating or among the global top three in terms of market share – one of the key criteria of HS. Nonetheless, due to the limited information available, for many hidden champions a final decision was not feasible leaving the in- or exclusion on firm's self-assessment during the research's

interview stage. The statistical analysis of applied financial and operational indicators for the overall sample is shown in the following figures 27 and 28.

	Count 'highest RoI performance' (year-to-year comparison)	*Relative RoI performance (average comparison)*	*Count 'highest revenue' (year-to-year comparison)*	*Relative revenue (average comparison)*	*Count 'highest profit' (year-to-year comparison)*	*Relative profit performance (average comparison)*	*Count 'highest sales growth' (year-to-year comparison)*	*Relative sales growth (average comparison)*	*Count market dominance in years (year-to-year comparison)*
Mean	1,029	1,042	1,644	1,600	1,563	1,736	1,108	0,090	1,664
Standard Error	0,140	0,179	0,152	0,155	0,120	0,398	0,099	0,330	0,157
Median	0,000	0,989	1,000	1,170	1,000	1,054	1,000	0,540	1,000
Standard Deviation	1,424	1,813	1,657	1,682	1,313	4,320	1,048	3,427	1,672
Sample Variance	2,029	3,286	2,744	2,828	1,723	18,666	1,097	11,745	2,797
Range	4,000	20,308	4,000	16,400	4,000	44,397	4,000	31,269	4,000
Minimum	0,000	-14,489	0,000	0,063	0,000	-13,987	0,000	-18,704	0,000
Maximum	4,000	5,819	4,000	16,464	4,000	30,410	4,000	12,565	4,000
Count	103,000	103,000	118,000	118,000	119,000	118,000	111,000	108,000	113,000
Confidence Level(95,0%)	0,278	0,354	0,302	0,307	0,238	0,788	0,197	0,654	0,312

FIGURE 27: DESCRIPTIVE STATISTICS – OVERALL SAMPLE

Data was collected for 103 to 118 firms depending on the performance indicator analysed. The majority of data missing is resulting from a lack of data on medium sized hidden champions. Nonetheless, the overall coverage of indicators per firm is ranging from 63 to 73%.

Performance indicators with the highest means are ‘relative revenue’ and ‘relative profit’ (1.6, 1.7). While the median is similar for ‘relative ROI performance’, ‘relative revenue’ and ‘relative performance’ (1.0, 1.2, 1.1), it is remarkably low for ‘relative sales growth’ (0.5). Moreover, the low median of ‘relative sales growth’ is reflected also in an extraordinary low mean of 0.1. Furthermore, ‘relative sales growth’ shows next to ‘profit performance’ (11.7, 18.7) the highest variance in the overall sample, while relative revenue is the least variant indicator (2.8).

	Count 'highest RoI performance'	*Relative RoI performance*	*Count 'highest revenue'*	*Relative revenue*	*Count 'highest profit'*	*Relative profit performance*	*Count 'highest sales growth'*	*Relative sales growth*	*Count market dominance in years*
Count 'highest RoI performance'	1,000								
Relative RoI performance	0,275	1,000							
Count 'highest revenue'	-0,053	-0,120	1,000						
Relative revenue	-0,142	-0,012	0,449	1,000					
Count 'highest profit'	0,310	0,040	0,268	0,197	1,000				
Relative profit performance	0,221	0,089	0,054	0,074	0,278	1,000			
Count 'highest sales growth'	0,141	-0,011	0,007	0,036	0,051	0,153	1,000		
Relative sales growth	-0,192	-0,033	0,001	0,018	-0,067	-0,125	0,018	1,000	
Count market dominance in years	-0,021	-0,112	0,973	0,442	0,275	0,104	0,046	-0,023	1,000

FIGURE 28: CORRELATION ANALYSIS – OVERALL SAMPLE

In addition to descriptive statistics for individual variables, correlation between different variables was analysed. Strong correlation between ‘count market dominance in years’ and ‘count highest revenues’ are caused by the fact that both are calculated based on relative revenue. While however the first is calculated on a yearly comparison of relative revenues compared to a firm’s key competitors, the latter is calculated on an average revenue basis. High correlation factors between ‘market dominance’ and ‘highest revenue’(0.973), ‘market dominance’ and ‘relative revenue’ (0.442) and ‘relative revenue’ and ‘highest revenue’ (0.449) reflect these interdependencies. The remaining variables do not strongly correlate.

In terms of financial and operational indicators 83 firms – 8 DAX, 8 SMI, 10 MDAX firms and 57 hidden champions – signalled hybrid characteristics. A strong signal assumes a firm is achieving in a year-to-year- comparison with its top three competitors over a four years period three or four times higher ROI performance or the highest revenue, profit, or sales. Accordingly, we assume medium signals if a firm outperforms its competitors on these indicators in only one or two of the four years period. If a firm does not achieve top performance in either of these indicators on a yearly comparison, no HS signals are assumed. This corresponds to the interpretation of indicators relating a firm’s performance to the average of the top three competitors over a four years period. In conclusion, a firm is selected if it shows in four or more of the indicators medium or strong signs of HS potential. These indications are further validated during the interview stage of this research. Figure 29 shows the descriptive statistics and the correlation of the selected sample. As we reduced the overall sample by almost half, a special interest of analysis is on the difference between the two samples.

Descriptive statistics of the reduced sample show strongest changes in mean and median of almost all variables. Strongest changes occurred in the mean of ‘relative sales growth’ (from 0.09 to 0.26 or 300% increase), ‘relative profit performance’ (from 1.74 to 3.0 or 74% increase), and ‘highest ROI performance‘ (from 1.03 to 1.78 or 73 % increase). Highest changes in median occurred for ‘market dominance’ (from 1.00 to 3.50 or 250% increase), ‘highest revenue’ (from 1.00 to 3.00 or 200% increase), ‘highest profit’ (from 1.00 to 2.00 or 100%) and ‘relative profit performance’ (from 1.05 to 2.00 or 90%). This is in line with the selection criteria applied to select those firms, that outperform the rest of the firms in a minimum of 4 dimensions. Contrary, mean only slightly improved for ‘count highest sales growth’ (+25%), ‘relative ROI performance’ (+8%) and ‘relative revenue’ (+6%). While however for the second and third variable the median substantially improved (+28%, + 26%), the median for ‘count highest sales

growth' remained unchanged. Compared to this, changes in sample variance are less consistent. While variance decreased for 'relative profit performance', 'relative revenue' and 'relative sales growth' (- 97%, -57%, -55%), it increased for 'relative ROI performance', 'relative profit performance' and 'count highest ROI performance' (+173%, +97%, +36%).

	Count 'highest RoI performance' *(year-to-year comparison)*	*Relative RoI performance* *(average comparison)*	*Count 'highest revenue'* *(year-to-year comparison)*	*Relative revenue* *(average comparison)*	*Count 'highest profit'* *(year-to-year comparison)*	*Relative profit performance* *(average comparison)*	*Count 'highest sales growth'* *(year-to-year comparison)*	*Relative sales growth* *(average comparison)*	*Count market dominance in years* *(year-to-year comparison)*
Mean	1,781	1,123	2,390	1,698	2,159	3,018	1,389	0,258	2,553
Standard Error	0,294	0,529	0,261	0,168	0,208	0,924	0,170	0,400	0,266
Median	1,500	1,267	3,000	1,469	2,000	2,002	1,000	0,673	3,500
Standard Deviation	1,660	2,994	1,671	1,103	1,380	6,058	1,022	2,296	1,639
Sample Variance	2,757	8,965	2,794	1,217	1,904	36,695	1,044	5,271	2,686
Range	4,000	19,008	4,000	5,495	4,000	44,397	3,000	14,123	4,000
Minimum	0,000	-14,489	0,000	0,063	0,000	-13,987	0,000	-10,806	0,000
Maximum	4,000	4,518	4,000	5,558	4,000	30,410	3,000	3,318	4,000
Count	32,000	32,000	41,000	43,000	44,000	43,000	36,000	33,000	38,000
Confidence Level(95,0%)	0,599	1,080	0,528	0,340	0,420	1,864	0,346	0,814	0,539

FIGURE 29: DESCRIPTIVE STATISTICS – SELECTED SAMPLE

Also, the correlation between the variables changed. While the interdependence of 'count market dominance', 'count highest revenue' and 'relative revenue' validates the calculation argument made above, the negative correlation of 'count highest revenue', 'relative revenue', 'count market dominance' and 'relative sales growth' with 'highest ROI performance' intensified concluding that ROI volume and growth are not necessarily leading to improved ROI performance. Rather, the profit situation seems to deteriorate in situations of revenue leadership or growth. This argument receives further support by the negative correlation of 'relative sales growth' with 'relative profit performance'. However, the variables for the sample of firms with hybrid signals are mostly invariant to each other.

	Count 'highest RoI performance'	*Relative RoI performance*	*Count 'highest revenue'*	*Relative revenue*	*Count 'highest profit'*	*Relative profit performance*	*Count 'highest sales growth'*	*Relative sales growth*	*Count market dominance in years*
Count 'highest RoI performance'	1,000								
Relative RoI performance	0,086	1,000							
Count 'highest revenue'	-0,371	-0,223	1,000						
Relative revenue	-0,473	0,033	0,604	1,000					
Count 'highest profit'	0,060	-0,088	0,283	0,333	1,000				
Relative profit performance	0,279	0,126	-0,062	0,023	0,273	1,000			
Count 'highest sales growth'	0,026	-0,130	-0,221	0,086	0,004	0,044	1,000		
Relative sales growth	-0,306	-0,009	0,189	0,057	-0,136	-0,510	-0,242	1,000	
Count market dominance in years	-0,344	-0,206	0,967	0,546	0,237	0,014	-0,255	0,049	1,000

FIGURE 30: CORRELATION ANALYSIS – SELECTED SAMPLE

D.3. CASE STUDY APPROACH, METHODS AND INSTRUMENTS

D.3.1. CASE STUDY APPROACH

Following one of the basic assumptions of this research, the number of companies successfully implementing HS is limited in one industry. Therefore, a cross-industry approach is applied focusing on HS firms identified by their competitive position gained or the profitability achieved rather than for example by the domain applied or geography covered (Runeson & Höst, 2009). Based on empirical data from company internal and external sources potential HS candidates are identified. The identified firms are invited for research participation by sending an invitation letter to the CEO.

The inclusion of data from multiple sources establishes construct validity and provides a basis for analytical generalization. Analytical generalization generalizes from a 'particular set of results to a broader theory' (Yin, 1994). This contrasts sharply with statistical generalization, which uses a population to identify generalizations or regularities in empirical studies. Typically, from the set of firms identified, the ones promising highest information richness – meaning most worthy of studying – are selected for the case study (Patton, 1990, p. 181; Perry, 1998, p. 793). However, in this research no discrimination according to information richness is made as the amount of HS firms is limited and consequently the set of firms participating is expected to be low. Therefore, further limiting the amount of cases according to information richness is not reasonable.

For conducting the interview, a protocol – as a kind of 'play writing' – is developed (Perry, 1998). According to the critical realist paradigm applied in this thesis, the interview protocol is closely aligned to the underlying research construct. This assures congruence between research issues and features of the study design.

The next step in the case study is to test the presence of the mechanism in the empirical setting. This is of immanent importance, as several mechanisms exist and it otherwise would remain unclear, if the purported mechanisms account for the phenomenon or if another mechanism generates the observable effects. In consequence, failing to test the presence of activity based mechanisms in the empirical setting can lead to a failure of understanding the process giving rise to hybrid competitive strategies and thus, ultimately missing the research objective. Alternative mechanisms to ABV can range from population ecology and natural selection, managerial choice and organizational behaviour to RBV. Thus, identifying the generative mechanisms in the empirical setting "is an effective way of assessing competing theories of

the same phenomenon" (Miller & Tsang, 2010). In this research, two ways provide evidence that the mechanism is present in the empirical setting. First, as the mechanism of interest in this research is not directly observable, its presence is tested by analyzing the collateral implications of the mechanism (Miller & Tsang, 2010). Thus, the mechanism is assumed present the more observable effects are attributable to the mechanism. In this research, this depends on the strength of financial and market performance, which is assumed strong if the mechanism exists. Another way of creating evidence is to reveal people's reasons, which can operate as causes for change (Bhaskar, 1998). In this case, retroduction offers a mean to create an image of reality by seeing interviewees providing their perceptions as 'windows on to reality' granting an image of reality (Perry, Riege, & Brown, 1999). Furthermore, the thesis' focus on HS commonalities from interviews across multiple firms provides support of the mechanisms presence. As a prerequisite assumption, however, this requires interviewees to truthfully disclose their reasons and researchers to project their own intentions onto the studied subjects; thus, allowing inferring and evaluating the subjects' espoused reasons by drawing heuristically upon our self-understanding for insights into others' unobservable intentions (Miller & Tsang, 2010). The basis for this hermeneutical act is our common humanity and experience rather than objectivity (Gadamer, 2002; Miller & Tsang, 2010). In conclusion, a generative real mechanism is assumed to be evidently present if the empirically observable results as well as the underlying commonalities are in line with the preliminary theory.

As, however, empirical evidence is included in this research for initially selecting firms by objective performance indicators the sine qua non condition of HS is fulfilled. Thus, the empirically observable facts, such as high market share or high profitability, provide evidence for consistent HS mechanisms to be existent. Consequently, for avoiding self-referencing arguments the existence of mechanisms is assumed as otherwise, the actual event of combining multiple competitive advantages leading to superior firm performance are used for selecting the firm *and* providing evidence that the actual events causing the selection criteria are operative. For that reason and in line with retroduction, the empirical evidence of the first is used to assume the existence of the other. On the other hand, further examination is required on the level of real generative mechanisms. This research focuses on the disclosure of common mechanisms causing the occurrence of actual events such as combining competitive advantages, and thus driving empirically observable facts such as superior performance. Of particular importance in distinguishing real mechanisms from actual events is the interplay of drivers, activities, capabilities and resources in the real domain and competitive weapons in the actual domain. As theorized in the research construct, actualiza-

tion of competitive weapons, an event, is caused by real generative mechanisms on the level of firm activities, resources and capabilities. In this notion, competitive weapons are a firm's competitive potential, which is only actualized if firm activities match external requirements and can be executed based on the availability of resources and capabilities. Thus, the case study approach centres on the relationship of a firm's real mechanisms and its competitive potential, but excludes the event of actualizing competitive advantages and empirical performance superiority. Again, this is due to otherwise self-referencing problems as firms in this sample were selected for outstanding performance achieved through competitive advantages. Or put differently, this research focuses on the question, what are the generative mechanisms firms apply for actualizing potential competitive weapons in order to combine competitive advantages assuming that they indeed had actualized this potential demonstrated by past superior performance. Therefore, only the first necessitates further investigation.

Furthermore, in data collection it is essential to establish researcher unbiased evidence and information richness by providing the basis for thick case description. Therefore, firm external and internal information are collected in a case study database. External information consists of data such as industry analyses, market and product information, as well as firm external reporting. This information is used twofold. First, it informs the preparation of the interviews by providing relevant background information. Second, it allows building up a rich case study database. In addition, internal information is collected in a two-step, semi-structured appreciative interview approach including predetermined, broad and open-ended questions for generating rich data and identifying key elements and the subsequent laddering for determining their relations.

As already mentioned before, the next two steps of 'test the causal effects of the mechanisms under controlled circumstances in a natural laboratory' and 'test if the mechanisms identified in the natural laboratory apply to phenomena of the broader research domain' conflate as the natural laboratory for this research is the focal firm participating. Rather, both steps are substituted by testing the synthesized HS model in the natural laboratory.

Typically, the causal effects of mechanisms under controlled circumstances are tested using experiments or quasi-experiments to help isolating causal effects of binary or more complex subsets of relations (Miller & Tsang, 2010). Alternatively, behavioural simulations are applied to mimic naturally occurring

organizational settings. For this research, it is argued that due to the importance of generic activity drivers on a firm's activity system experiments and simulations are inapplicable as lacking situational context. Rather, each case is regarded a natural laboratory in which specific propositions are already tested and retroduction can be applied (Godfrey & Hill, 1995). For that reason, firms are often sampled to cover contrasting cases providing evidence from natural experiments (Miller & Tsang, 2010). This research differs in this respect by intentionally selecting cases based on HS indications. Thus, the selection criterion is similarity rather than variation, and cases are not covering the range of strategic variations and performance differences within an industry but explain commonalities among firms applying HS in different industries. This way, no pathological or extreme cases can be identified approximating isolated testing in experiments (Danermark, Ekström, Jakobsen, & Karlsson, 2002). On the other side, this provides the basis for 'real world experiments' allowing evaluating in-depth strategic similarities and covers the interests of this research sufficiently in terms of deep explanations (Runde, 1998; Downward, Finch, & Ramsay, 2002).

Furthermore, despite conflation of testing presence in laboratory and in open systems settings, it is essential to test auxiliary hypotheses. According to the Duhem-Quine thesis a test system is always constituted by a principal hypothesis *and* its associated auxiliary hypothesis (Duhem, 1954; Quine, 1961). Auxiliary hypotheses can be either core or peripheral with core assumptions indicating major impacts on the mechanism under investigation and peripheral referring to just minor implications. Thus, a principal hypothesis can never be tested alone and thus, stressing the importance of a theory's boundary definition. In this thesis, the limits of the theory are clearly determined by the interplay of a firm and its market or respectively its customers. Particularly, the firm-market intersection is mainly determined by activity drivers, which in turn define the major auxiliary hypothesis of this research. This is due to the fact that activity drivers describe the prerequisites for HS mechanisms to be effective. Or more precisely, activity drivers trigger the external mechanism in form of activities, capabilities and resources operating at the interface of firms and its customers. For example, in markets characterized by standard quality products, in which customers are primarily concerned with cost, HS are all but required and efficient. Contrary, in markets dominated by customers requiring both low cost and superior product differentiation, HS can outperform single focused strategies.

D.3.2. PROCEDURES ESTABLISHING VALIDITY AND RELIABILITY

Assessing qualitative methods, such as case studies, requires quantitative research criteria of validity – namely construct, internal and external validity – and reliability (Johnston & Smith, 2010). In general, validity assesses if the research is measuring what it intends to measure, while reliability is concerned about if the results are consistent. For achieving an accurate and precise research result, meaning measuring the right measures in a consistent way, both criteria need to be established

In positivistic research, *construct validity* assesses if the empirically collected data is related to the theoretical construct being researched (Riege, 2003). As case study research is often criticized for being subjective, the key requirement to establish construct validity is to take operative measures to resist subjective judgement during research design, data collection and analysis (Riege, 2003). *Internal validity* controls in quantitative research for cause-and-effect relationships (Riege, 2003). Applied to case studies, this requires not just to identify the key differences and similarities of data collected but also to determine the significant components and mechanisms responsible for producing the phenomena under research (Riege, 2003). *External validity* strives towards establishing generalizability above the scope and boundaries of the research setting. Thus, in case study research analytical not statistical generalization is essential.

Reliability, which is primarily concerned with the precision of results, requires case study research to demonstrate repeatability. This however is often obscured by the nature of case study research conducted by different researchers focusing on real-life events in specific configurations (Riege, 2003).

While these quantitative criteria are potentially useful assessing qualitative research, they are, however, not sufficient. Critical realist case study research requires additional, specifically designed criteria. However, only few scholarly contributions had elaborated such criteria allowing differentiating two forms for determining additional criteria (Healy & Perry, 2000). First, *transforming* validity and reliability criteria rooted in quantitative research and second *complementing* the quantitative methods with ‘corresponding’ criteria (Healy & Perry, 2000; Riege, 2003).

By transforming validity and reliability criteria to qualitative criteria Healy and Perry, determine six evaluation tests: Ontological appropriateness, contingent validity, epistemology, methodological trustworthiness, analytical generalization and construct validity (Healy & Perry, 2000). Following Healy and Perry, ontological appropriateness is concerned with the research topic covering complex social

phenomena. Contingent validity deals with the open systems character of underlying mechanisms working in the social sphere. Methods applied are literal and theoretical replication, in-depth questions, focus on 'why' issues and context description of the cases. Furthermore, realist epistemology assumes a value-aware position, accepting a real world although it is only improperly apprehensible, meaning that observing reality from multiple angles will open the window to a more or less unobscured reality. In order to gather such a shape of reality, triangulation from for example multiple participants, sources, and methods is required. This includes for example using broad questions before addressing probe questions, researcher's self-describing and assessing his own values as well as peer reviews of published reports. Methodological trustworthiness means that the research can be audited. For that reason, a case study database needs to be set-up, relevant quotations and matrices summarizing data need to be included in the report and procedures for case selection and interviews need to be described. Analytical generalization, which is primarily used for theory building, is the qualitative correspondent to external validity, assuring that the phenomena is applicable to the broader research domain. High generalizability is achieved by identifying the research issues before data collection and formulating an interview protocol that will provide data for confirming or disconfirming the theory. Finally, construct validity evaluates if the research is sufficiently measuring information about the theoretical construct. Methods applied to control for construct validity are use of prior theory and case study data base as well as triangulation. For an extensive discussion on transformed criteria see Healy and Perry (Healy & Perry, 2000).

Another form of deriving evaluation criteria for critical realist case research is complementing quantitative validity and reliability criteria by 'corresponding' design tests (Riege, 2003). Accordingly, on basis of 'quantitative' validity and reliability tests corresponding 'qualitative' tests are developed. This leads to four qualitative criteria of confirmability, credibility, transferability and dependability (Yin, 1994; Guba & Lincoln, 1994; Miles & Hueberman, 1994; Denzin & Lincoln, 1994). This establishes an additive relationship to quantitative tests. Confirmability is analogous to construct validity and assures that the interpretation of data is done in a logical and objective manner. For construct validity, Riege suggests the application of methods such as using multiple sources of evidence establishing a chain of evidence and having key informants review a draft case study report (Riege, 2003; Yin, 1994). For the corresponding qualitative confirmability test, a confirmability audit for examining data, findings, interpretations and recommendations is proposed. Methods assuring internal validity in qualitative research

are cross case pattern matching, explanation-building, and ensuring systematic relationship between internal coherence of findings and concepts. Credibility as the corresponding criterion for internal validity, is achieved through methods such as triangulation, interviewee and peer reviews, determination of researcher's assumptions, worldview and theoretical orientation as well as researcher's self-monitoring (Riege, 2003). The last validity check regards generalization. External validity and its corresponding transferability test aim both at showing similar or different results on similar or different respondents or organizations. Applied methods for assuring external validity are multiple case replication, scope and boundary definition allowing analytical generalization and comparing evidence with extant literature (Riege, 2003). Assuring transferability requires methods such as pre-determining questions in interview protocol, thick case description, case study database and specific procedures for coding and analysis. Last but not least, reliability and its qualitative complement dependability, refer to whether the research inquiry can be replicated, based on the assumption that the same methods are applied. Methods for achieving reliability are fully exploiting available theoretical foundation, congruence of research issues and features of study design, developed and refined case study protocol, multiple researchers, detailed recording of observations and actions, recording and storing data in case study database and peer review and examination. Correspondingly, dependability's set of methods include dependability audits for examining and documenting the process of inquiry as well as a clarification of researcher's theoretical position and biases. For an extensive discussion on the above described corresponding criteria see Riege (Riege, 2003).

Figure 31 provides a summary of evaluation criteria and methods along the generic research steps of research design, data collection, data analysis and researcher's diary and reporting writing.

Step	Validity criteria Construct validity (incl. transformed and corresponding criteria)	Internal validity (incl. transformed and corresponding criteria)	External validity (incl. transformed and corresponding criteria)	Reliability criteria Reliability (incl. transformed and corresponding criteria)
1. Research design	Use of prior theory	Researcher's assumptions, worldview, theoretical orientation Focus on 'why'' issues	Use replication logic in multiple-case studies Define scope and boundaries of reasonable analytical generalisation for the research Use of predetermined questions with broad questions before addressing probe questions Use of in-depth questions	Give full account to theories and ideas Clarify researcher's theoretical position and biases Assure congruence between research issues and features of study design Describe procedures like case selection and interview procedures Develop and refine case study protocol Dependability audit (examine and document the process of inquiry)
2. Data collection	Use multiple sources of evidence Establish chain of evidence Confirmability audit	Triangulation Researcher's self-monitoring Context information	Thick description (develop case study database)	Use multiple researchers Record observations and actions as concrete as possible Record data, mechanically develop case study database
3. Data analysis	Confirmability audit	Do with-in case analysis, then cross-pattern matching Do explanation building Assure that internal coherence of findings and concepts are systematically related Triangulation Peer debriefing Researcher's self-monitoring	Cross-case analysis Compare evidence with extant literature Specific procedures for coding and analysis	Use peer review and examination
4. Researcher's diary & report writing	Key informants review draft case study reports	Participant checks Peer reviews of published reports Context description of the cases		Include relevant quotations and matrices summarizing data

FIGURE 31: OVERVIEW ON CRITERIA ESTABLISHING QUALITY IN QUALITATIVE RESEARCH

Based on this analysis, this research includes several activities establishing validity and reliability. Figure 32 provides an overview on methods applied.

Initial to the research enquiry is evaluating if critical realism is applicable to the nature of the research questions. This answer provides the selected research philosophy including the researcher's assumptions, worldview and theoretical orientation. In this respect, the 'why' character of the research question strongly indicates the appropriateness of critical realism. Both, explicating researcher's assumptions and the 'why' character of the research question establish internal validity. In addition, the appreciative inquiry method allow determining the most important 'elements' of HS before the laddering technique elaborates on the 'why' by linking these elements. Furthermore, clarifying the researcher's theoretical position provides reliability of the research results.

The research construct describes the research's scope and boundaries and provides the foundation for analytical generalization and thus external validity. In addition, using prior theory as further evidence triangulates on external validity (Perry, 1998). The research construct contains the research objects and entities, their structures, the events of outcomes investigated and their emergence as well as their relations and the relevant circumstances affecting the event (Easton, 2010). Moreover, the research construct in-

cludes the initial theory for this research based on prior theory. This establishes internal validity. In addition, peer reviews are used to adapt the initial research construct, hence establishing construct and internal validity.

In research design, the use of prior theory is a source of additional evidence and founds the basis for further theory advancement (Miles & Hueberman, 1994). Furthermore, extensively reviewing literature – as in this thesis – increases generalizability through giving full account to theories. By this, existing knowledge is leveraged, theoretical level raised, construct definitions sharpened, and external reality triangulated. In addition, it comprehensively establishes validity and reliability (Eisenhardt, 1989; Riege, 2003; Perry, 1998).

Step	Activity	Reason
Research construct	Development of an a priori research construct comprising prior theory	Construct validity
	Theoretical orientation and researcher's assumptions	Internal validity
Research design	Use of prior theory, peer review and interviews for triangulation of research design	Internal validity
	Multiple-case study across industries	External validity
	Literal replication	External validity
	Description of purposeful selection of firms	Reliability
	Explicate detailed description of methods and procedures for clarifying researcher's theoretical position and biases	Reliability
Data collection	Traceable inferences from data to research questions and existing theory	Construct validity
	Use of sufficient citations and cross checks	Construct validity
	Use of multiple data sources and data for triangulation	Construct validity
	Retention of data for inspection by auditor allowing a confirmability audit	Construct validity
	Participant, data source and data triangulation	Internal validity
	Data collection procedure documented and externally reviewed	Internal validity
	Use predetermined, broad questions before addressing probe questions	External validity
	Semi-structured interview approach including theory derived, detailed probe questions	External validity
	Include internal and external background information for context description	Internal validity
	Develop a case study database as basis for a thick description available for external audit	External validity
	Document process of inquiry for external examination	Reliability
	Record interviews mechanically	Reliability
Data analysis	Outside review of logical and unprejudiced inference as part of confirmability audit	Construct validity
	Multiple data analysis methods for triangulation	Internal validity
	Cross-case pattern matching	Internal validity
	Compare empirical data with predicted theoretical patterns in a pattern-matching strategy	Internal validity
	Document process of analysis for external examination	Reliability
	Compare with conflicting and similar literature	External validity
	Review and examination of draft case study reports by peers	Reliability
Report writing	Peer and participant review of published reports	Internal validity
	Context description of cases	Internal validity
	Include relevant quotations and matrices summarizing data	Reliability

FIGURE 32: ACTIVITIES ESTABLISHING VALIDITY AND RELIABILITY IN THIS THESIS

Providing explicit descriptions of methods and procedures in research design enables repetition and increases the reliability of research results. The use of multiple case studies across different industries enhances external validity, however, prevents theoretical replication. Nonetheless, this limitation is accepted due to the trade-off between either concentrating on a specific industry allowing comparing several strat-

egy types with each other or focusing on a specific strategy type across several industries. Thus, external validity is established by purposefully selecting cases allowing literal replication and ensuring that information was obtained from appropriate, information-rich sources (Easton, 2010; Healy & Perry, 2000). Presenting the research design before entering the field for data collection and analysis is essential for reliability because it assures congruence of the research and the study features through peer reviews allowing identifying adaptation needs.

As case studies are flexible design studies key parameters of the study can change during the course of the study (Runeson & Höst, 2009). The conduct of these iterations is incremental and causes the data collection and data analysis to merge (Runeson & Höst, 2009). Nonetheless, each of these steps is discussed separately in the following. First, data collection's main target is creating the basis for traceable inferences from data to research questions and existing theory. This inference provides construct validity. According to critical realism, identifying real generative mechanisms requires capturing multiple perspectives. Thus, triangulation is critical for realist case research. For that reason, this particular research uses triangulation by including multiple data sources, data and participants. Data sources used are company internal and external. Data collected include financial and non-financial as well as quantitative and qualitative information. Further, triangulation is achieved by including multiple participants from different hierarchical firm levels and functions. To mitigate researcher bias, thick case descriptions are provided complying with Mintzberg's claim that 'we uncover all kinds of relationships in our hard data, but it is only through the use of this soft data that we are able to explain them' (Mintzberg, 1979). For a thick description firm external and internal information are collected in a case study database. External information consists of data such as industry analyses, market or product information. This information allows building up a rich case study database, which can be audited externally, thus providing internal and external validity. This procedure establishes validity in several ways. Construct validity through triangulation protecting against researcher bias, internal validity through providing comprehensive context information necessary for establishing a chain of evidence and external validity through thick case study description (Peräkylä, 1997). Internal information is collected in interviews with predetermined, broad and open-ended questions establishing internal validity by offering insights into the causal mechanisms operating in the respective case. In a two-step interview approach starting with appreciative interviews followed by laddering questions, the first part is used to identify interviewee's construct elements, while the second part with its 'why' questions establishes relationships between these elements. As the predetermined

questions act as a guide it ensures that the researcher is asking same key questions in every interview. Due to the romantic interview perspective applied in this research, the interviewer takes an active role in stimulating and activating the interviewee's creative potential. However, without carefully balancing that stimulation, this may increase researcher bias (Perry, 1998). Despite this fact, external validity can be achieved in appreciative inquiry by a non-judgemental interviewer only asking follow-up questions to gain clarity (Troxel, 2002).

In addition, detailed verbatim interview transcripts found the basis for developing a chain of evidence. For that reason, interviews are recorded electronically and are captured in detail for establishing reliability. Moreover, supplying sufficient citations and cross checks of particular sources of evidence extend the chain of evidence (Hirschman, 1986). Finally, data storage and procedural documentation is driving reliability, construct and internal validity of the research results. For that reason, research data is retained for inspection and a confirmability audit is conducted as well as the data collection procedures are documented and reviewed as part of researcher's self-monitoring.

Furthermore, the use of multiple cases in this research allows cross-case analysis enhancing external validity essential for literal replication and rigorous analysis (Perry, 1998). Moreover, this research applies a pattern matching strategy. While, however, pattern matching is typically done in a hypothetico-deductive way, this research uses pattern matching by comparing empirical data with predicted theoretical outcomes of the synthesized HS model developed. This provides internal validity (Perry, 1998). In addition, thick context descriptions allow understanding cause-effect relations across cases and provide the basis for evaluating the research result's generalizability. Additionally, sufficient citations and cross checks establish construct validity. Comparing research results with conflicting and similar literature is increasing external validity. All processes are documented for external review, thus, allowing research repetition. Finally, peer review and examination of research results support reliability of research results.

In report writing, it is essential to provide a chain of evidence for the research's audience. Thus, it is mandatory to provide a thick description of the cases, including relevant quotations and matrices summarizing data, for establishing reliability. Finally, internal and external validity is established through peer review of published reports

D.3.3. Interview methods and instruments

A. Explanatory, semi-structured interviews

Critical realist research approaches – as applied in this thesis – try to explain the conception of some kind of phenomenon such as performance or competitive advantage by another phenomenon such as specific firm activities (Bhaskar, 2008; Lawson, 1997). In order to achieve this, neither induction nor deduction can be applied; rather a different approach – retroduction – is necessary (Bhaskar, 1998). Retroduction is primarily used for theory building and typically presupposes a smaller set of cases for which more details are collected and analyzed (Yin, 1994). Furthermore, contrary to the 'traditional' approaches of induction and deduction, which are using statistical generalization by contrasting results from a population to a general theory, retroduction generalizes analytically by comparing 'a particular set of results to a broader theory' (Yin, 1994). Thus, a general theory is determined if some evidence is found that supports the theory, however, without necessarily proving it definitively (Firestone, 1993). This accentuates the 'preparadigmatic' stance of critical realist case studies towards developing a theory rather than testing and verifying it and corresponds to this research's objective aiming at confirming or disconfirming elements and their causal relations for achieving HS. Consequently, this case study is 'confirmatory' or 'explanatory' in nature (Perry, Riege, & Brown, 1999; Saunders, Philip, & Thornhill, 2009). As opposed to purely exploratory, inductive approaches, this requires the inclusion of prior theory and the use of *one* interview protocol for all cases facilitating cross-case analysis (Perry, Riege, & Brown, 1999).

In this case study, a two-step qualitative interview approach for generating rich data is applied. In order to identify the appropriate interview methods and instruments for this research endeavour, it is necessary to first determine which interview perspective to use: a neopositivist, romantic, or localist perspective (Alvesson, 2003). Neopositivists' view interviews as instruments able to elicit knowledge from interviewees seen as vessel-of-answers (Holstein & Gubrium, 1995). Thus, neopositivist interviews avoid research bias through applying interview protocols explicitly outlining questions. Also, they assume competent and truth telling interviewees unambiguously understanding researcher's questions and interviewers reciprocally understanding interviewees responses (Schultze & Avital, 2011). While neopositivists assume that facts elicited by the interviewee allow discovering reality, romantics consider interviews as a site for human interaction to explore the inner world of meaning and feeling of the interviewee (Gubrium & Holstein, 2002). While neopositivists are critiqued for not considering the

complex social situation of an interview, romantics are critiqued for their approach's sensitivity towards idiosyncrasies of the interview situation (Alvesson, 2003). Localists, instead, consider the interview itself as the object of inquiry assuming that within the local interview scene situated and morally adequate accounts are produced (Schultze & Avital, 2011). Thus, localists emphasize contextual factors of the interview and personal factors of the interviewee. Consequently, localists do not accept interviewees as knowledgeable experts like neopositivists and refute the possibility of capturing reality (Kvale, 2008).

While each of the three perspectives has its challenges, all have merits as well. Alvesson recommends for that reason a pragmatic approach of reflexivity, which is sceptical on interview material as reliable information but not completely condemning it (Alvesson, 2003). Rather, the instrumental view can be enhanced by critically interpreting the situation and considering the social scene the interview is taking place as well as the interviewee's constitution and the nature of language (Alvesson, 2003; Schultze & Avital, 2011).

In this thesis, a romantic stance is combined with pragmatic reflexivity. While interviewees are in a neopositivist tradition seen as vessels-of-knowledge, the predominant romantic stance considers them co-researchers, whose interpretive capabilities need to be activated and stimulated (Holstein & Gubrium, 1995).

As the purpose of this research is explanatory, a non-standardised, face-to-face, semi-structured, and open-ended interview approach is chosen. Non-standardised as the focus is on 'qualitative research' and semi-structured, as the interview will be guided by a list of questions, however, these may vary according to the specific organisational context in the individual firm (King, 2004; Saunders, Philip, & Thornhill, 2009). Moreover, semi-structured interviews allow probing and thus gaining richer data from respondents, which is essential in qualitative research.

Collecting and analysing interview data on a firm's underlying mechanisms is challenging as only traces in the empirical domain are observable, while the real and actual is not directly observable (Bhaskar, 2008). Thus, the first challenge originates from the question on who is providing data on a firm' strategy. One possibility to investigate the 'deeper levels of reality' is to reveal people's reasons, which can operate as causes for change (Bhaskar, 1998). The critical realist approach providing this opportunity is 'retroduction'. It is an enquiry mode aiming at explaining events by postulating and identifying mecha-

nisms capable of producing them. (Miller & Tsang, 2010; Sayer A. , 1992). Thus, retroduction "involves moving from a conception of some phenomenon of interest to a conception of a different kind of thing (power, mechanism) that could have generated the given phenomenon" (Lawson, 1997, p.236). Identifying and measuring working mechanisms in certain situation as well as testing for conjunctions of mechanisms as explanations for empirical outcomes characterizes this mode of enquiry (Miller & Tsang, 2010). In interviews, retroduction requires interviewees truthfully disclosing their reasons as well as researchers projecting their own intentions onto the studied subjects. Only then, it is possible to infer and evaluate the subjects' espoused reasons by drawing heuristically upon our self-understanding for insights into others' unobservable intentions (Miller & Tsang, 2010). The basis for this hermeneutical act is our common humanity and shared experiences rather than objectivity (Gadamer, 2002; Miller & Tsang, 2010). In consequence, each organization member provides a perspective on the real and actual domains of his or her reality. Furthermore, involving multiple members of the organization allows triangulating reality from a critical realist point of view (Bhaskar, 2008).

Typically, however, the critical realist domains of the actual and real are inaccessible by simply asking for it; rather the use of creative methods and instruments is required (Prahalad & Bettis, 1986). Thus, the second challenge is to achieve insights into these deeper layers of the organization. One possibility is to access the cognitive world of the members of an organization (Calori, Johnson, & Sarnin, 1994). In this sense, strategies are considered abstractly as reflections of the values and the cognitive bases of its powerful actors (Hambrick & Mason, 1984; Mintzberg, 1987). Thus, applicable methods and tools need to allow accessing the cognition of managers and employees (Calori, Johnson, & Sarnin, 1994). As there is no agreed terminology on the construct of managerial cognition, the terms 'mental maps', 'frames or references', 'mindsets', 'cognitive base', 'beliefs', 'schemata', 'cognitive structures', and 'cognitive maps' are used synonymously (Walsh & Fahey, 1986).

B. Interview methods

Interviews are conducted in two steps in a multi-method approach combining appreciative inquiry and laddering.

Method 1: Appreciative inquiry

Appreciative inquiry (AI) allows discovering 'the elements and factors in an organization that enabled it to achieve success in the past' by seeking the best in 'what is' (Troxel, 2002, p. 1; Michael, 2005, S. 223). AI can enable a collective imagination of 'what might be' (Michael, 2005, S. 223). As a tool developed for organizational change, it is rooted in social sciences and based on the heliotropic principle stating that firms are growing towards positive images similarly to plants growing towards sources of light (Cooperrider, 1990; Postma, 1998). Consequently, AI's basic assumption is that organizations operate out of an image or a mental model of itself, the world and the future and each firm has something that can be appreciated in the current and pursued in the future (Troxel, 2002). As a tool, AI is particularly valuable for identifying sustainable designs as it allows exploring what made an organization vital and how to prosper in the future (Schultze & Avital, 2011). The interview is 'appreciative' by seeking to identify a firm's achievements rather than its problems or weaknesses and it is an 'inquiry' as it relies on organizational members and their 'work life' stories as primary sources of information (Cooperrider, 1990; Troxel, 2002). Consequently, AI facilitates this research's objective to isolate, magnify, and document the "life-giving forces", which are a firm's activities, capabilities and resources making the existence of the organization possible (Troxel, 2002). AI is based on a process of affirmation or better an 'organizational theory of affirmation' requiring the researcher to affirm and thereby illuminate the factors and forces involved in a firm (Kolb, 1984; Cooperrider, 1990).

Four principles are constitutional for AI (Troxel, 2002): First, appreciation as a starting point from which to work on (Elliot, 1999). Second, application follows a pragmatic approach leading to new understandings and validation in action. Third, provocation assuming that each organization is an open-ended indeterminate system, which is capable of becoming more of what it is and of learning how to actively take part in guiding its future. Fourth, collaboration, in which organizational members are being treated as co-researchers in identifying the life-giving forces of an organization. Typically AI starts with appreciating what a company has achieved (Michael, 2005). This phase discovers highlights such as an individual's peak moments or memories of extraordinary achievement in its work life and, thus, allows extract-

ing the building blocks of an organization's success. Based on the identified building blocks the phases of 'dreaming-designing-destiny' start, in which 'what might be' is envisioned and developed. As the objective of this research is to 'discover' the underlying generative mechanisms in firms already achieved HS the envisioning aspect of AI is not required for yielding the aimed research results (Michael, 2005).

One frequent critique at AI is its blindness in respect of covering negative aspects of organizations. However, AI can be a promising starting point, as is the case in this thesis, from which to work on in example for identifying a firm's core resource, capabilities and activities (Elliot, 1999). However, while research findings resulting from AI run danger to be partial, AI practitioners argue, that this is a deliberate choice depending on the research project and results intended (Liebling, Price, & Elliott, 1999). Anyway, AI owns the potential for creating a dynamic making people speak freely about their experiences and yielding a more nuanced and deeper understanding of the positive and the negative factors in organizations (Michael, 2005).

In order to appreciate the best of 'what is', questions in the interview need to address what worked well in the past. Based on the four main research objectives, open-ended interview questions adresses all elements of the research construct. In the following, a chain linking interview questions to the research construct is developed.

The interview is structured in five categories – (1) personal factors, (2) industry environment and generic drivers, (3) competitive weapons and advantages, (4) resources and capabilities, and (5) activities. The following describes the questions of each of these categories and its link to the research construct. Analysing the research construct will then allow answering the research questions.

Entry questions are on an interviewee's favourite memory of working in the organization as well as the part of the organization he is most proud of. By this, typically, affirmation is brought early into the conversation and the interviewee has a chance to identify her or his personal highlight in respect to the firm. This also acts as a strong indicator on a firm's strength as the interviewee, not the researcher guides this question, and thus, it is not directed towards the underlying research construct.

The next questions cover the underlying mechanisms operating in the different domains of reality described in the research construct. As discussed in 'research construct', *activities* are actualizing competitive potential in form of competitive weapons through internal and external mechanisms (Sheehan &

Foss, 2007). First, the internal mechanism of exposing a firm's resources and capabilities to market processes allows realizing their value and ability to generate competitive advantage (Ray, Barney, & Muhanna, 2004). This explains the *how* and *what* of combining competitive advantages. The how explains the way resources and capabilities are applied to achieve competitive advantage and the what describes the building blocks used for achieving competitive advantage. Second, activities are externally directed to an industry's generic activity drivers and require a firm to adapt its activity system and its stock of capabilities and resources. In addition, it is necessary to align external and internal mechanisms requiring a consistent concept for orchestrating both in parallel. This is different to the external mechanism as it identifies the needs, but is not adapting the activity system accordingly. Furthermore, it provides the momentum to change but does not explain how to adapt a firm's activity system, which is provided by the consistent strategy concept a firm applies. Such a concept, however, does not constitute a mechanism but rather an orientation for a firm's management and its employees.

Two questions address the second category of 'industry environment and generic industry drivers'. First, 'from what circumstances and success factors in your industry is your organization benefiting more than your competitors?' and second, 'how is your organization achieving to better handle these circumstances and success factors than your competitors? '. While the first question points to an industry's main characteristics in terms of, for example, industry dynamic or rivalry among competitors, the second question focuses on an interviewee's perceptions of how the firm benefits from theses industry conditions. This way, an industry's key generic activity drivers such as economies of scale in RD or brand image can be identified.

The third category 'competitive weapons' focuses on a firm's competitive potential originating from a firm's core activities, resources and capabilities. This is *what* customers attract to the firm's products and services and *what* the firm allows beating competition. The corresponding questions are 'what do you think attracts your clients to your organization and your organization's products and services?' and 'can you tell me your favourite story about how you have beaten your competitors?'. Category 4 'resources and capabilities' is a first step in the *how* a firm achieves this competitive potential and addresses questions such as 'what do you think is at the heart of your organization's success' and 'what resources and capabilities are especially important in making you more successful than your competitors'. By this, the core resources and capabilities important for a firm's success can be identified. The final category of 'activities' is separated in two parts: a static and a dynamic perspective. While the first tries to identify

'what specific strengths a firm has in deploying and adapting its resources and capabilities', the second is directed towards a more dynamic view and elicits what enables a firm internally to meet changing industry requirements'. The first question marks the second step in determining *how* a firm achieves competitive potential, while the second question specifies *when* a competitive potential is actualized and thus explores a firm's balancing activities. Figure 33 provides an overview on the 10 questions used in the AI part of the interviews.

Interview perspective	**Interview method**	**Interview category**	**Interview questions for AI** (n=10)
Romantic/ Reflexive	**Appreciative Inquiry**	**Personal factors** (*n=2)*	• What's your favourite memory of working here? • What part of your organization are you most proud of?
Romantic/ Reflexive	**Appreciative Inquiry**	**Industry environment and generic drivers** *(n=2)*	• In each industry certain critical success factors exist. What are the critical success factors in your industry? • How is your organization achieving to better handle these success factors than your competitors?
Romantic/ Reflexive	**Appreciative Inquiry**	**Competitive advantage and weapons** (*n=3)*	• What do you think attracts your clients to your organization and your organization's products/services? • Can you tell me your favourite story about how you have beaten your competitors? • What do you think is at the heart of your organization's success?
Romantic/ Reflexive	**Appreciative Inquiry**	**Resources and capabilities***(n=2)*	• What resources are especially important in making you more successful than your competitors? • What capabilities allow you to outperform your competitors?
Romantic/ Reflexive	**Appreciative Inquiry**	**Activities** *(n=1)*	• What are the activities enabling you to successfully compete in the industry?

FIGURE 33: INTERVIEW QUESTIONS FOR APPRECIATIVE INQUIRY

The face-to-face AI results in a set of activities, resources and capabilities, which are being captured by the interviewer during the interview on index cards. After completing the ten AI questions the respondent is asked to validate, adapt or categorize, if necessary, the presented index cards. In case of changes, the interviewer adds new, or adapts or subsumes existing index cards. While, however, it is of great importance to determine the vital elements allowing achieving HS, AI fails to establish links between them. Thus, AI needs to be supplemented by another technique able to relate elements to each other. Both views together create the basis for identifying the real generative mechanisms underlying consistent HS implementations.

METHOD 2: LADDERING

Laddering is a methodology potentially fruitful for identifying relationships between elements and real generative mechanisms. It is a marketing methodology applied to identify consumers' underlying values through a 'micro approach' focusing from customer perspective on linkages between a product's attrib-

utes, consequences resulting from these attributes, and personal values reinforcing these consequences (Gutman & Reynolds, 1979; Reynolds & Gutman, 1984). Rooted in means-end theory, laddering specifies the rationale why consequences are important (Gutman, 1982). The cognitive levels of abstraction in means-end theory are attributes (At), consequences (C), and values (V), which are linked together in networks, or ladders and can serve as a basis for distinguishing between and among products in a given product class (Reynolds & Gutman, 1988). An example ladder distinguishing snack chips could start with an product attribute 'flavoured chips' leading to another attribute 'strong taste' resulting to several consequences such as 'eat less', 'don't get fat' and 'better figure' triggered by the personal value of 'self-esteem' (Reynolds & Gutman, 1988). Such means-end ladders are achieved by allowing respondents to think critically about connections between the product's attributes and a person's motivation (Reynolds & Gutman, 1988). Thus, laddering is a powerful one-to-one interviewing technique using series of direct probes of 'why is that important to you?" allowing accessing multiple layers of meaning associated with interviewees' life world (Schultze & Avital, 2011). The resulting cognitive map often in the specific form of a 'hierarchical value map' represents the linkages between the three levels of abstraction (AtCV). As a kind of predecessor for laddering, the expectancy-value-theory (EVT) assumes that consumers select products according to certain consequences resulting from a product's attributes (Rosenberg, 1956; Reynolds & Gutman, 1988). This distinguishes EVT from laddering as the initial starting point is not a product's attributes, but consumer action. Through these actions, namely buying behaviour, the consumer learns what consequences a product can generate. These consequences are then associated with product's attributes. Thus, while laddering has product attributes, consequences and personal values (AtCV) as levels of abstraction, EVT abstracts from consumer action to consequences to product attributes (AcCAt).

The last fits particularly well to this thesis' research construct as it considers a firm's activities, capabilities and resources responsible for generating events, namely competitive potential and competitive advantage. Competitive advantages (cost, quality, innovation, variety, speed) in turn lead to higher customer appreciation and consequently, to relatively higher firm profits. By repeatedly applying activities, capabilities and resources, managers and employees learn to associate certain elements with consequences and market results. Eventually, understanding the relationship between EVTs abstraction levels (AcCAt) is the basis for conceiving a firm's underlying mechanisms, what is the objective of this thesis. Thus, laddering in general but EVT in particular are fitting this research's approach well in several ways: First, its multi-layered reality across actions, consequences, and attributes corresponds to the critical realist

perspective applied in this research. Thus, it allows identifying what generative mechanisms are actualizing HS events. However, the original laddering technique starting with the question of 'what are the underlying personal values of consumers' is substituted by AI specifying the elements of AcCAt. Correspondingly, laddering's original question of 'why are certain product attributes important for generating specific consequences fulfilling consumer values' needs to be adapted in the second part of the interview to a more EVT oriented question of 'why are certain firm activities, resources, and capabilities important to generate competitive consequences allowing achieving outstanding customer value ?'.

Based on the set of activities, resources and capabilities noted by the interviewer on index cards during the face-to-face AI, the interviewee will be asked to validate, adapt or categorize, if necessary, the presented set of index cards. In case of changes, the interviewer adapts the index cards and sorts them according to the hierarchical order provided by the interviewee. The corresponding prioritization criteria are derived from a resource's potential to generate sustainable economic rent through its value, limited strategic substitutability and inimitability as well as its scarceness. (Dierickx & Cool, 1989; Barney J. B., 1991; Teece, Pisano, & Shuen, 1997). Drawing on this ranking, the laddering process starts with the index cards ranking highest in terms of strategic importance by asking the interviewee why this activity, capability and resource is important for the firm. This allows eliciting on the one side, the distinctions between the elements identified and on the other side, depicting the major links constituting generative mechanisms.

D.3.2. Case study analysis methods and tools

Analysis methods and tools vary according to the two-step interview approach. While the results of the AI part are represented by the answers provided by the interviewees on the above stated ten questions, results from laddering are hierarchical maps relating the elements captured on index cards.

In total, data from 12 interviews were gathered summing up to 252 pages of interview transcripts. Additionally, 11 pages of firm profiles comprising primary and secondary firm data were collected. Altogether, over 110,000 words on data were analysed.

Analysing such amounts of data is challenging and requires 'sifting through the data, filtering out the significant information, identifying patterns, and constructing a framework for communicating the essence' (DeNardo & Levers, 2002; Patton, 1990). As no 'recipe' exists for guiding this data transforma-

tion, this is for many researchers the most complicated step in the overall research process (Patton, 1990; Leech & Qnwuegbuzie, 2011). For completing the task two often combined general approaches exist – manual or computer assisted approaches (Welsh, 2002; Mason J. , 1996). However, in recent years more qualitative researchers apply Computer-Assisted Qualitative Data Analysis Software (CAQDAS) for data analysis as it eases and speeds up the tasks of manual analysis (Ulin, Robinson, & Tolley, 2005; DeNardo & Levers, 2002; Patton, 1990; Leech & Qnwuegbuzie, 2011). Additionally, CAQDAS facilitates views on data through managing data more efficiently and provides transparency and rigour to qualitative research (Bandara, 2006; Miles & Hueberman, 1994; Kelle, 1997a; Kelle, 1997b; Welsh, 2002; Kirk & Miller, 1986; Richards & Richards, 1994). However, CAQDAS has also risks of directing the research, distancing the researcher from the data, or homogenising research methods (Seidel, 1991; Barry, 1998; Hinchliffe, Crang, Reiner, & Hudson, 1997). Nonetheless, CAQDAS supports validity and reliability of qualitative research.

Many social scientists lack knowledge and expertise in evaluating and selecting CAQDAS. Therefore, researchers often need to rely on pragmatic selection criteria such as available software packages, accessible trainings, research colleagues' recommendations, or sufficient user-friendliness of the software (Welsh, 2002). Consequently, not the 'best' software program needs to be selected, but the one satisfying the researcher's level of comfort of applying CAQDAS for specific research (Miles & Hueberman, 1994; DeNardo & Levers, 2002; Taylor & Bogdan, 1984). For this research, NVivo 10.0 from QSR is applied for reasons such as its popularity, its ease of learning, its availability and knowledge accessibility at the institution this research took place as well as its sufficiently satisfying the research's needs of organizing, searching, coding and categorizing data (Richards & Morse, 2002; DeNardo & Levers, 2002; Smith & Hesse-Biber, 1996; Welsh, 2002).

In general, four general steps are typically required in data analysis: data collection and transcription, code development from data and assignment of textual-represented data, code translation into categorical themes, and sorting collected material to categories (Berg, 2001; DeNardo & Levers, 2002). Coding in this context means tagging 'major themes and the sections of text in which those themes reside' permitting 'the identification and recording of units of meaning, called 'nodes'' (DeNardo & Levers, 2002, p. 4; Kelle, 1997a; Weir, Marsh, & Greenwood, 2008, p. 225). Coding is not differing between manual or computer-aided approaches, however, CAQDAS can ease this task and provide new perspectives and

insights compared to manual approaches (Patton, 1990; Kelle, 1997a). Categories can represent a diversity of abstract ideas, concepts or even people identified through cross-code analysis. In this research, a code can be a specific activity such as 'involve and empower employees' residing in a top-node or category such as 'activities in HR management'.

This thesis' critical realist approach aims at specific objectives and thus requires a certain set of activities compared to the standard approach. For that reason, first, the main objectives of the data analysis approach are briefly explained, before the steps of preparing and analysing the data is described.

The first *objective* of the data analysis approach is documenting empirical results of AI, laddering and firm profiles. While this is rather preparatory in nature, this research stage aims additionally at identifying constituting elements and the underlying mechanisms of HS. Additionally, the critical realist stance and particularly its explanatory nature require a specific analysis approach.

While following the first step - collecting data and transforming it into text - of the standard approach, the second varies as data collected are not used for developing codes. Rather the opposite, the second step codes data to predetermined elements of the synthesized HS model. This approach fits well with case studies' character of 'situational groundedness *and* theoretical generality' (Harper, 1992; Downard, Finch, & Ramsay, 2002). While these two steps focus on data preparation, the next focuses on analysis. The first *analysis* step is to map textual-represented data to predetermined codes on two hierarchical levels. While top-nodes are categories of either activity drivers, activities, capabilities or resources, sub-nodes or nodes are more specific representations. Additionally, top-nodes act as pools of data otherwise unassigned. This allows identifying new elements and categories not yet included in the synthesized HS model through allocating empirical data to top-nodes in case no assignment to an existing sub-node is possible. The newly identified elements then lead to adapt the theoretically derived HS model. A *fifth* step assures that empirical data coded to each node is coherent and belongs to the assigned category. A similar approach for identifying success factors and measures for process modelling is used by Bandara (Bandara, 2006). In a sixth manual step, laddering results are applied for determining the relational importance of elements.

According to the above explained analysis approach, NVivo is used in several ways. First, transcripts of *AI, laddering and summary firm profiles* are stored in NVivo. Following that for each of the a priori determined categories and elements of the synthesized theoretical HS model nodes are created in NVivo.

For general categories, as for example ‘management capabilities’ or ‘company culture’, tree-nodes or top-nodes are established (Leech & Qnwuegbuzie, 2011). Elements such as ‘capability to establish close customer relationship’ represent subsets of categories and are set-up as sub-nodes (Leech & Qnwuegbuzie, 2011). Based on this NVivo structure, empirical data such as interview text or ladder elements are coded to sub-nodes or top-nodes. If top-node codings lead to adapting the theoretical model on a sub-node level previously coded data was re-evaluated and recoded accordingly. This allows evaluating the theoretically derived model’s integrity (Bandara, 2006). Finally, text and ladder elements coded to top-nodes and sub-nodes are evaluated on consistency and internal coherence.

Overall, the computer-assisted data analysis results in an empirically revised, synthesized model representing the basis for identifying elements and determining their relational importance. For this, a two step approach is applied. The first step analyzes each ladder element allowing determining the most important underlying concepts, activity drivers, activities, capabilities and resources, while the second is focused on analysing relationships between the model’s elements. Consequently, the first analysis is focusing on ladder element analysis (LEA) while the second is centring on relationships in ladder analysis (LA). In combination, both allow evaluating the real underlying HS predicted in the research construct. Figure 34 provides a summary of the data analysis objectives and approach.

Objective	Empirical data	Data analysis method	Data analysis step	Description
I. Document empirical results	• Appreciative interview • Laddering	Manual	1. Collect data and transform into text	• Transcribe interviews and document laddering results
II. Identify HS elements	• Appreciative interview • Laddering	Computer-assisted by NVivo	2. Create nodes structure in NVivo	• Create nodes tree based on a priori determined categories and elements
			3. Map data to a priori model in NVivo	• Code text and ladder elements to relevant nodes
			4. Adapt nodes in Nvivo	• If potential new elements are identified new nodes are created • Recode previously mapped data based on new nodes structure
			5. Analyse nodes coding In NVivo	• Analyse data coded to each node assuring appropriate affiliation and internal coherence • Analyse data coded to each node in terms of subcategories existent
III. Determine ladder relationships	• Laddering	Manual	6. Compare relationships in laddering results with research construct	• Analyse relationships of external and internal mechanisms

FIGURE 34: DATA ANALYSIS OBJECTIVES AND APPROACH

D.3.3. LIMITATIONS OF CASE STUDY RESEARCH, METHODS AND HOW THEY WERE HANDLED

The chosen approach limits the research's findings mainly by applying case study and using AI and laddering methods.

Case study approaches face two general weaknesses: developing overly complex and deriving narrow, idiosyncratic theory (Eisenhardt, 1989). The first results from high data quantity generated, while the second refers to case study's inductive character limiting generalizability of results from a specific case to a broader basis (Eisenhardt, 1989).

For dealing with the first weakness, this research applies mitigation measures in data collection, documentation and analysis. For instance, in data collection laddering allows condensing interview content, while in documentation all raw data grouped by informant are recorded electronically, coded with standard codes and assigned to theoretically derived categories altogether reducing data complexity, establishing a chain of evidence and shaping overall themes and categories (McLachlin, 1997; Miles & Hueberman, 1994). Furthermore, generalization is ensured through validating case study results to theoretical propositions and not statistical populations, thus enabling analytical instead of statistical generalization (Yin, 1989, p.21). Moreover, both general limitations address case study's validity and reliability warranted by measures such as replication logic across multiple cases, cross-case data analysis, and extensive literature comparison.

Additionally, a specific limitation of case studies is recurrent trade-offs by case selection bias (George & Bennett, 2005). While quantitative case study research is strongly affected by this bias as otherwise the strength of relationships between independent and dependent variables is underestimated, qualitative research is less vulnerable to 'selection bias' (George & Bennett, 2005). For certain purposes, qualitative researchers can even apply dependent variables for example for identifying 'potential causal paths and variables leading to the dependent variable of interest' (George & Bennett, 2005, p. 23; Collier & Mahoney, 1996). As this research selected cases based on the dependent variable 'firm performance', scrutiny in determining selection criteria and methods were essential.

Despite these limitations, however, case study research is able to examine causal mechanisms as well as to model and assess complex causal relationships leading to accepting the approach for this research (George & Bennett, 2005, p. 21).

Appreciative inquiry is mainly critiqued for its emphasis on the positive running danger of preventing constructive criticism, invalidating negative experiences and not considering weaknesses, problems or failures (Patton, 2003; Golembiewski, 2000; Egan & Lancaster, 2005; Bushe, 2011; Miller, Fitzgerald, Murrell, Preston, & Ambekar, 2005; Pratt, 2002). In this line of reasoning, critique manifests on 'AI's habit of decontextualized polarization, with positive and negative treated as having intrinsic meaning, instead of acknowledging that what is positive for some may be negative for others, goes to the heart of the matter (Bushe, 2011, p. 10; Oliver C. , 2005). In this respect, AI proponents counter that determining the negative indicates also the positive and thus, find ample evidence of AI research revealing negative thoughts and feelings (Bushe, 2011; Bright D. S., Powley, Fry, & Barrett, 2011). Furthermore, AI researchers argue that positing a polar position complies with and thus, unleashes the full generative potential of human nature (Johnson P. , 2011).

Also the laddering interview technique is criticised in several instances. Among the most important are data collection procedures, different levels of abstraction, analysis efforts, difficulty to conclude from data to strategy to executional design and implications, validity in terms of interviewer interferences in raw data collection and in content analysis, simplicity restricting the scope and depth of answers and problems with pre-definitions of cut-off levels. A brief description of each of the limitations of this research as well as measures applied to mitigate them is provided in the following.

First, data collection through repetitive questions can indicate issues and thus, produce desired responses from interviewees (Woodruff & Gardial, 1996). Additionally, repeating asking 'why' questions can result in respondent's exhaustion or resistance (Veludo-de-Oliveira, Ikeda, & Campomar, 2006). For that reason, this research's interviews start with informing interviewees on the specifics of the laddering technique. Another limitation of this technique is that respondents 'argue rationally' for justifying their behaviour or concealing not knowing the response (Botschen, Thelen, & Pieters, 1999; Reynolds & Gutman, 1984).

Second, different levels of abstraction ranging from elements such as activities, capabilities and resources in the real domains to performance indicators in the empirical domain can lead to respondents having difficulties in understanding the concepts (Veludo-de-Oliveira, Ikeda, & Campomar, 2006). For

that reason, interviews explain before the laddering part of the interview the most important elements of activities, capabilities and resources.

Third, interviewer interference in content analysis can result in validity issues. However, this is required by 'the sheer magnitude of tedious work an analyst must perform to complete an analysis' and the 'difficulty bridging from data to strategy to executional design and implications' (Gengler & Reynolds, 1995, p. 19). In data analysis, interviewer bias can result from coding the elements in order to reconstruct the meaning respondents assigned to it (Grunert & Grunert, 1995). This is especially critical for constructing ladder chains applying data coded by only one interviewer (Veludo-de-Oliveira, Ikeda, & Campomar, 2006). Furthermore, content analysis is criticised for element selection and grouping according to a subjective process leading to potentially excluding other relevant variables (Lin, 2002). For mitigating this limitation of research bias, all interviews are recorded electronically and are transcribed allowing reappraising the laddering results. In addition, following Grunert and Grunert's recommendation computer-aided content analysis tools and methods are applied (Grunert & Grunert, 1995).

Fourth, the simplification of mechanisms across different elements and categories 'can restrict the scope and depth of answers, which could not really reflect the real thoughts from respondents' (Veludo-de-Oliveira, Ikeda, & Campomar, 2006, p. 638). In consequence, the interviews in this research are separated in two distinct, consecutive steps of first, AI granting rich responses and second, laddering structuring the responses.

Fifth and last, analysing and interpreting data in laddering generates difficulties in predetermining cut-off levels limiting the range of interpretations (Lin, 2002). This is of particular importance in respect to the amount of data resulting from AI and laddering interviews (Gengler & Reynolds, 1995). Responding to this limitation, absolute and relative cut-off levels are determined for identifying relevant data in ladder element and ladder analysis.

V. EMPIRICAL ANALYSIS

Critical realist research approaches – as applied in this thesis – try to explain the conception of some kind of phenomenon (e.g. performance, competitive advantage) by another phenomenon generating that phenomenon (e.g. firms having unique and valuable research capabilities or perform specific activities) (Bhaskar, 2008; Lawson, 1997). In order to achieve this, retroduction is used for theory building. Typically, this presupposes a smaller set of cases for which more details are collected and analyzed (Yin, 1994). Furthermore, contrary to the 'traditional' approaches of induction and deduction, which are using statistical generalization by contrasting results from a population to a general theory, retroduction generalizes analytically by comparing 'a particular set of results to a broader theory' (Yin, 1994). Thus, a general theory is determined if some evidence is found that supports the theory, however, without necessarily proving it definitively (Firestone, 1993). Moreover, this research's 'confirmatory' or 'explanatory' nature requires the inclusion of prior theory and the use of *one* interview protocol for all cases facilitating cross-case analysis (Perry, Riege, & Brown, 1999; Saunders, Philip, & Thornhill, 2009). However, due to the confirmatory nature, the number of cases covered is limited marking this research's results as a 'starting point' for further statistical generalization. Furthermore, this approach, demands in-depth analyses for understanding underlying mechanisms at the real and actual level driving empirical results. Typically, this is achieved by gaining deep understanding of the phenomena and interpreting the respondent's experiences and beliefs in their own terms, (Perry, Riege, & Brown, 1999). This also restricts the number of cases included as it requires a physical and psychological proximity to the phenomenon under investigation in order to determine previously unknown relationships 'expected to emerge from case studies leading to a rethinking of the phenomenon being studied' (Stake R. , 1994). Last but not least, the fact that only a few firms in each industry successfully conduct HS, further limits the number of cases applicable in this research.

Nevertheless, in this critical realist case study certain mitigation measures are taken for improving generalizability. First, the use of prior theory for determining the research construct and for triangulating empirical results (Healy & Perry, 2000). Second, by defining research issues before collecting the data and formulating the interview protocol will provide evidence for confirming or disconfirming the theory (Riege, 2003). Third, literal replication across multiple cases expecting similar results for predictable reasons (Yin, 1994). Fourth, by analytical generalization through replication of multiple cases

and definition of research scope and boundaries before entering empirical work (Riege, 2003). Fifth and last, by capturing the perceived reality of multiple participants providing several 'windows on to reality' allowing triangulating a picture of reality (Perry, Riege, & Brown, 1999).

A. Participating firms

5 of the selected 83 firms positively responded to the request for research participation sent by postal mail mid of 2013. The invitation letter shown in Appendix 3.1 comprised two pages with the first page including a brief introduction of the research project and the second providing a reply template for participation.

The first introductory page briefly explained the research endeavour and stated the effort required for interviews with senior managers or executives. In order to increase willingness for participation it also described the value of participation – namely summary provision of results, optional presentation or workshop on detailed results, as well as invitation to a final presentation of the overall results. Moreover, on the first page detailed contact information for feedback via mail, fax or email was provided. For this, a reference to the feedback template on page 2 was made. This template comprised all information for scheduling the interviews such as the name of the firm participating, a central key contact person to contact for scheduling meetings as well as names of potential interview partners on senior or executive management level.

In response to this request, five firms agreed to participate resulting in 12 interviews executed from November 2013 to January 2014. All interview partners were either senior managers or executives with functional, business unit or cross-business unit responsibility. As hierarchies and job titles differed between the participating firms, senior managers were assumed having functional responsibility, while executives having a business unit or even cross-business unit responsibility. According to this definition, interviews with seven executives – with six having single business unit and one having cross-unit responsibility – and five senior managers took place.

As described in more detail below, all firms operate in an industry environment characterized by technology orientation driven by intensive RD, high product quality and branding. In addition, all firms are among the price leaders in their respective industries. Thus, it is assumed that neither the industry – despite varying – is a differentiator for a firm's activities, capabilities and resources, nor its customer segments. Of the five firms, only two firms operate in pure business-to-business segments, one is solely

focussed on the business-to-consumer segment and two serve both customer segments. Nonetheless, the impact of industry or customer segments is controlled by applying a firm-level analysis.

A brief description of each participating firm is provided in Appendix 4. As firms are granted confidentiality, descriptions are anonymised.

B. Empirically revised synthesized HS model

This chapter evaluates and, if necessary, adapts the theoretically derived, synthesised HS model based on empirical data resulting from interviews, laddering and firm profiles. Therefore, first, adaptation needs resulting from coding empirical data to the theorized model are explained, before second, an empirically revised HS model is developed.

Adapting the theoretically derived synthesized HS model is data driven and aims at evaluating the HS model's top-nodes and sub-nodes. Assigning empirical data to nodes will either support or refute the theoretical model elements leading to one of three potential consequences. First, supporting a node leads to sustaining the element. Second, not confirming a node results in suspending the node, and last, determining data directing to new, not yet theoretically identified elements leads to expanding the model.

B.1. Adaptation needs from top-node coding

Many interviewees, for example, determined 'brand' as an operational resource important for firm success. As, however, no sub-node for 'brand' exists in the theoretically derived model a new sub-node needs to be introduced. For testing this necessity, a two-step test is applied. First, top-nodes pooling empirical data not directly assigned to sub-nodes are reviewed in terms of commonalities, and in case a consistent and common patterns appear, second, a new sub-node is introduced. Otherwise, top-node codings either are reassigned to existing sub-nodes or are excluded at all, if representing anecdotal evidence.

In particular, empirical data was coded to the following top-nodes: 'Operational Resources', 'Management Capabilities', 'Human Resource Management', 'Research and Development', 'Outbound Logistics', 'Marketing and Sales', and 'Service'. The respective codings assigned to each of these top-

nodes are discussed briefly in the following. Based on this discussion, amendments to the theoretical HS model are determined.

The following analysis uses data on two different levels: first, the level of an individual interview and second, an aggregation of interviews on firm level. This ensures that specifics of firms with multiple participants are not distorting the empirical results and analysis.

1. Operational resources

Data from 24 sources is coded 47 times to category '1. Operational Resource'. In particular, 11 interviewees stated topics not directly assignable to the top-node's single sub-node 'sufficient and long-term investment'. Furthermore, data coded to the top-node includes 18 ladder elements of 11 different interviewees from five firms.

By firm, brand topics are most often mentioned comprising four firms and five different interviewees, while by interviewee motivated and skilled employees is ranked top with eight participants from three different firms. Additionally, three interviewees from three different firms consider intellectual property and patents an operational resource. As mentioned above already, for avoiding overweighting firm specifics by considering purely the amount of interviewees, the starting point for identifying model adaptations is the firm level. The discussion starts with brand.

As interviewees from four firms emphasized the importance of brand as an operational resource, it is regarded an important commonality. In particular, several interviewees emphasized the importance of brand as the most valuable firm resource by stating for example 'our strong brand is probably the most expensive and biggest resource', 'brand is our biggest resource' or 'brand is clearly a particular strength of our firm'. This is underpinned by external data included in the firm profiles confirming the importance of brand for several firms. Consequently, the common sub-node 'brand' is added in NVivo to the top-node of 'Operational Resources' and the above mentioned brand related codes are reassigned accordingly. In turn, nine ladder elements of nine interviewees from three firms are reassigned.

Moreover, seven interviewees from three firms allude topics on employees such as motivated and highly technically, functionally and socially qualified employees as an essential operational resource. In one firm, even two interviewees consider this the most important resource. One interviewee even

linked its global market leadership to a proportionally higher amount of engineers in RD. Furthermore, in two cases interviewees linked employee skills to the firm's location in Central Europe - namely Germany and Switzerland - granting access to highly qualified employees. Consequently, employee skills and capabilities are considered important operational resources and thus, a sub-node is added analogously to 'brand' to the top-node ‘operational resources’. The corresponding data including five ladder elements is reassigned to this new sub-node.

Moreover, 3 participants, each from different firms, mentioned intellectual property as well as patents as operational resources. An especially sensible definition of one of the interviewees points to a broad understanding of innovation, which is important for both RD as well as MS: 'Our intellectual property consists of technical as well as application oriented know-how. This is certainly one of our biggest resources we possess. In principle, we were trend-setter in LED applications, which pays off today'. However, one interviewee contrasts, despite stressing the importance of patents, that other activities or capabilities such as the firm’s culture and employee’s know-how are even more important in protecting intellectual property than patents, which can be bypassed or even imitated. In this line of argument and contrary to brand and employee skills, intellectual property seems less commonly shared across participating firms. Furthermore, only one ladder includes innovation and patents. Thus, intellectual property and patents are not considered a commonality across firms and are consequently excluded.

In summary, operational resources are extended by two common resources: strong brand and motivated and highly qualified employees. Accordingly, data is recoded and 14 ladder elements are adapted.

2. Management capabilities

Data from 8 sources is coded 20 times to top-node '9. Management Capabilities' from which one common theme appeared by five interviewees from five different firms: a pragmatic execution capability. However, interviewees stress different aspects of this capability. For instance, one interviewee described the firm's management as pragmatic and activity oriented combining analytical and planning elements. This interviewee stated that “somehow it could be described as 'operative management with a strategic orientation' enabling the firm to quickly implement or stop activities”. Another interviewee

mentions a similar aspect in terms of the firm's strategy: "while strategy is just one side of the coin, the other side of our success is consequent execution". In addition, the interviewee argued that the firm is strong in executing long-term strategies instead of having revolving discussions on it. According to interviewees, two benefits result from this kind of management behaviour: low levels of politics and – more or less caused by it - a low degree of idle power and fast decisions. While the first allows the firms to convert more of its power into customer and market perceived actions, the second allows firms to react faster to changing requirements. Moreover, one interviewee focused on management's direct communication skills for intensely interacting with employees in headquarters and subsidiaries. Furthermore, one interviewee focused on the firm's capability to change, necessitating the firm's management to identify and evaluate both, the change necessity and the degree of change required. The interviewee emphasized the firm's history of constant change as evidence for this management capability. In this line of reasoning, another interviewee stressed 'growth', which is a particular driver of change, as a firm specific management capability. Based on broad firm representation and despite a relatively low interviewee representation of approximately 42%, a new sub-node 'pragmatic execution capability' is added to 'management capabilities'. Accordingly, corresponding data is recoded and four ladder elements are adapted.

Furthermore, two interviewees mentioned one additional management capability each: resistance and direct communication. However, due to low firm and interviewee representation both are seen as anecdotal evidence and are consequently excluded.

3. HR management

The top node '27. HR Management' was coded ten times from eight different sources. While three of the codings are oriented towards the firm's strong performance orientation and thus, can be reallocated to '14. Capability to provide objectives and incentives for clear orientation', two other statements are directed to management development and thus, can be reallocated to '29. Educate and motivate employees'.

The remaining five top-node codings – 2 interviews and 3 ladder elements – from three participants highlight topics such as 'employee attractiveness' or 'employer branding', 'talent recruiting' and more specifically 'employee recommendation based recruiting'. In a certain sense, this is expanding the

above explained importance of the resource of 'motivated and highly qualified employees' as it allows both, to select from a broader pool of talent and to increase the fit of applicants with the firm's requirements. Consequently, this activity is strongly intertwined with the resource of employees as it allows generating this resource on the one side and using the resource for activities on the other side. Thus, the sub-node of 'attract talents / develop employer branding' is added to the top-node, however, for different reasons than the ones applied for 'operational resources' and 'management capabilities'. While the before mentioned amendments are driven by empirical evidence *on the resource or capability itself*, the inclusion of the sub node 'attract talents / develop employer reputation' is *mainly argued by its importance* for another element – namely the operational resource 'motivated and highly qualified employees'. Accordingly, the corresponding codings are adapted.

4. Research and development

Data of seven interviewees from four different firms are coded to top-node '36. Research and Development'. All data either centre on innovation capability in general or specifically on customer perceived innovation emphasizing only different foci. Correspondingly, one interviewee stated that "our products are technologically at least equivalent to our competitors or being more precise we are at least two to three years ahead of competition. Nonetheless, this technological advantage should, however, always translate into a benefit for the customer, which proves to be the real difficulty." While in the interviews, 4 participants from 3 different firms referred to this more general definition of innovation including internal as well as external product innovations, two referred to the customer perceived side of innovation. Surprisingly, none of the ladders include the later perspective meaning 5 ladder elements of four different firms are solely focused on innovation capabilities in general. As most of the firms and almost 60% of the interviewees raised a general capability *with* a particular focus on customer value a new node 'Capability to innovate and generate customer perceived value' combining both was required. This and the rather operational nature of the capability leads to adding a new sub-node to 'Operational capabilities'.

5. Outbound logistics

Two different managers from one firm mentioned a specific outbound logistics activity: late assembly for customizing products to customer specific needs. Due to limited empirical evidence and a rather

specific nature of this topic, the corresponding coding is suspended as a commonality but represents a specific activity of SQHS and VCHS.

6. Marketing and sales

Overall, eleven interviewees covering all firms mentioned 26 times data from 18 different sources, which were assigned to ’51. Marketing and Sales’. Thereof, the majority of codings result from ladders (n=15) with the remaining representing interview data. Central themes are threefold: first, achieve strong brand position by matching the firm’s values with customer’s perceived value, second, focus on customer advisory and third, product lifecycle management based on product platforms.

Nine interviewees comprising all five firms raised themes such as ‘excellent image on all different levels of marketing’, ‘for example our trade exhibitions create a customer experience conveying all of our values’, or ‘we position ourselves in all media very positively. I think that contributes to our excellent image’. These topics are raised in 10 ladder elements providing a broad empirical evidence leading to add the sub-node ‘strongly position and align brand with customer perceived values’.

Moreover, five interviewees from three different firms mention the second aspect of ‘customer advisory’. This topic is intertwined with innovations generating customer perceived valued and thus, necessitating strong customer advisory as all firms’ products combine two characteristics: complexity and innovation. Consequently, customers trying to apply complex *and* innovative products in areas such as laser manufacturing, cleaning, motion picture cameras and lights, glass processing, or medical treatment demanding strong and comprehensive advise guaranteeing the most efficient and effective use of the firms’ products. In summary, combining advisory focus and technical and application know-how relevant in RD leads to a slightly higher support of 7 interviewees from 4 firms. Regardless of this somewhat increased empirical support, however, key reason for incorporating the additional sub-note ‘focus on enabling customers in product use’ is its interdependence with the above determined new operational capability ‘to innovate and generate customer perceived value’.

Moreover, one interviewee raised product lifecycle management based on modular product platforms in two ladder elements. As this is rather SQHS and VCHS specific than common across HS types a corresponding coding is suspended.

7. Service

Data of seven interviewees is coded 28 times from 12 different sources to the top-node ’58. Service’. From the ten interviewees of four firms two common themes appeared: First, service is applied to ensure or to quickly restore usability of the firms’ products and second, establish close customer relationship.

Seven interviewees from three firms mention topics on ‘applying service to ensure or quickly restore product usability’ in eleven ladder elements. All of them state service itself – such as service quality, service capability, and high service and customer orientation – as important for reaching this goal. The only firm, not explicitly pointing out that topic is firm four, which is offering customer service in all its locations in more than 60 countries as well as from more than 36,000 dealers in more than 160 countries. Thus, also for this firm, despite not explicitly mentioning it, this aspect seems important. The reason for this is that customers of all firms share a common characteristic: customers depend strongly on the firm’s products for generating income or providing relieve for health problems. An exception to this is the fourth firm’s consumer jewellery business. Thus, fast and quality service for restoring product usability – in terms of unexpected down-times – is of immanent importance for the firms’ customers. Second and even more important for customers than resolving product difficulties is, however, to receive high quality products avoiding inefficient idle and maintenance time at all. This more product oriented aspect leading to higher satisfaction with the firm’s products by lowering the total amount of service required is raised by three interviewees from two firms. This empirical evidence leads to adding the new sub-node ‘apply service to ensure or quickly restore product usability’.

Moreover, four interviewees from three firms point out geographical proximity to customers as an essential activity. One interviewee specifically cited a customer appreciating that “the firm cares of me, wherever I am.” Thus, this practice allows establishing a close customer relationship providing the basis for collecting customer information. As this sub-node already exists, but mentioned topics such as ‘feedback on what customers require’, ‘information on pretested devices from service’ or ‘collection of moods and opinions on our product’s quality’ are mainly focusing on establishing close customer proximity, it is suggested to combine both sub-nodes to ‘establish close customer relationship’ including ‘information collection’ and ‘customer proximity’. Correspondingly, the former sub-node 59 is renamed and ladders including geographical proximity are recoded.

8. Underlying concept and activity drivers

As all interviewees explicated in either interviews or ladders to realize high product prices in their markets a new sub-node ‘N9. High product price’ is included. However, this amendment is of less importance as product prices were – at least implicitly – included in the performance criterion used for selecting participating firms. Nonetheless, for providing an exhaustive view on HS elements this adaptation is made.

Next, adaptation needs resulting from testing empirical support and consistency of sub-node codings are discussed.

B.2. Adaptation Needs from sub-node coding

Each of the sub-nodes is analysed in three steps. The first step is testing coding consistency and commonality. In case of inconsistent or non-common codings the respective text sections or ladder elements are either reassigned to other sub-nodes or excluded as anecdotal evidence. The second step further deepens the analysis in terms of evaluating theoretical sub-nodes by empirical data resulting in retaining sub-nodes in cases of three or more firms, or six or more interviewees are raising the element in interviews or ladder elements. In certain cases, elements are also retained as strong interdependence to or from other sub-nodes exists providing indirect support to the element. This is the case for one activity, namely ’47. Apply customer information in RD’, which is only mentioned by one firm and two interviewees. However, all firms and 75% of all interviewees state ‘52. Establish close relationships’ and ‘53. Capture customer needs and focus on perceived customer value‘ as essential activities required to be included in product design. Thus, the activity is sustained in the model based on the indirect nature of its relationship with other nodes. While following the same logic, the argument for retaining the underlying activity drivers of economies of modularity, integration, quality and speed is different. Instead of interdependence most interviewees apparently not recognize these concepts and thus, empirical support is rather low. However, as for example economies of integration depend on modular product platforms providing the basis for mass customization, the conceptual basis is used to empirically underpin HS cost drivers. In all other cases, sub-nodes are eliminated from the empirically evaluated synthesized model.

The following figures 35 to 44 present a detailed overview on adaptations made resulting from sub-node analysis. The consequent adaptations from both top-node and sub-node analyses allow revising the theoretical model shown in figure 45.

FIGURE 35: SUB-NODE ANALYSIS ON RESOURCES AND CAPABILITIES (1 OF 2)

Resource / Capability	Empirical support				Excerpt of quotes and ladder elements / conclusion	Implication
	Firms	Interviews	Ladder elements	Ladders		
2: Sufficient and long-term investment	5	8	8	8	• "No number oriented strategy… rather we say, if we do what we do – and we do it well - revenue and profit result as a logical consequence" • "Based on our market leadership and our high profitability and contribution margin we have the power to invest particularly in innovations" • "… long-term investment behaviour focused on sales and service for getting closer to customer" • "The firm has a particular strength in terms of earnings and financial resources resulting mainly from its profitable growth in the past. Earnings are mainly retained within the firm as the family-owners are strongly committed to the firm's development" • Independent owner families or far-sighted shareholders foster long-term orientation instead of short-term profit maximization. • Average age of 91 years of participating firms	Retain resource
4. Capability to implement and operate ICT	0	0	0	0	• -	Remove element
5. Informational and analytical capability to process and analyse information	1	1	0	0	• Importance of rather general communication capability	Remove element
6. Capability to operate flexible, computer integrated manufacturing	4	6	13	8	• Highly automated, flexible, lean and proprietary production system and expertise; applying 'fractal production units' or 'small, mobile production units" • "The production assets we possess are less important than the system we operate allowing to flexibly produce a high variety of products" • "We were the first in the industry applying flow-assembly, even if we produce only eleven machines a year"	Retain capability
7. Organizational and individual learning capability	4	5	7	6	• Firms characterized by 'dynamic and fast learning', 'flexible and learning', 'able to learn' or 'able to adapt' and 'create own expertise'.	Retain capability
8. Capability to sense and respond to customer preferences and align operations accordingly	3	6	3	3	• "Anything but trivial to sort out the relevant information from the multitude of customer feedback received for deriving action" • "We discuss with selected customers on planned innovations" • "Thinking from the user" and thus, "achieving higher initial fit"	Retain capability

FIGURE 36: SUB-NODE ANALYSIS ON RESOURCES AND CAPABILITIES (2 OF 2)

Resource / Capability	Empirical support				Excerpt of quotes and ladder elements / conclusion	Implication
	Firms	Interviews	Ladder elements	Ladder		
10. Capability to manage system based	4	5	6	8	• "Strong capability in managing our global and regional strategies" • "We know on which processes to focus at"	Retain capability
11. Capability to manage, combine and integrate knowledge	0	0	0	0		Remove element
12. Capability to identify, evaluate and capture market opportunities	5	6	11	11	• "Strong innovation capability even extended during financial crisis" • "Fast and adequate reactions" • "Clear market segmentation"	Retain capability
13. Capability to educate and sustain employees	5	9	11	7	• "You are either employed for one or two years or you stay for ever as you can see that you can change something in the industry" • "Our employees are consistently better trained and educated than our competitor's" • "Many development opportunities", "we recruit our managers from within the firm"	Retain capability
14. Capability to provide objectives and incentives for clear orientation	3	6	10	7	• "Performance orientation", "production with performance objectives", "monitoring production efficiency" • "Management focus on one business with one specific business model" • Acknowledge and reward performance	Retain capability
15. Capability to build long lasting customer relationships	2	2	1	3	• "Develop long-term customer relationship" • Low empirical support for this rather general capability results from assigning higher emphasis on activities establishing customer relationship such as collecting and applying customer information in development or manufacturing, or enabling customers in applying the firms products in marketing and sales • General capability not as important as activities establishing relationship	Remove capability
16. Capability to integrate external partners	2	4	4	4	• "High proportion of parts supplied by external partners" • Close collaboration with 'external research institutions' and 'suppliers' • Only two firms supporting this capability	Remove capability

FIGURE 37: SUB-NODE ANALYSIS ON CULTURAL ELEMENTS

Culture	Empirical support				Excerpt of quotes and ladder elements / conclusion	Implication
	Firms	Interviews	Ladder elements	Ladder		
18. Culture fostering employee commitment to HS concept and customer satisfaction	4	11	13	12	• "Commitment of employees across all hierarchy levels" • "Alignment of forces" in " search for best solution for customers" • "Best quality as firm culture", "enthusiasm of employees for products and industry"	Retain cultural element
19. Culture fostering customer orientation and change affinity	4	7	6	5	• "We are highly dynamic, which makes it so interesting working here as you are permanently faced with new challenges" • "This is one of our secrets of success, we always extended our competencies" • "Reinvented ourselves several times"	Retain cultural element
20. Culture fostering collaboration and knowledge exchange	5	12	21	14	• "I am proud of how people treat each other within the firm" • "The collaborative, 'playing as a team' and future oriented spirit in our firm" • "All pulling in the same direction"	Retain cultural element
21. Culture fostering long-term orientation	4	8	8	5	• "Stability of the firm", "job security" and "long-term orientation" • "We are especially strong in implementing a long-term strategy" • "We [the management] try to convey our enthusiasm to our employees. We want to take all employees along on our journey"	Retain cultural element
22. Culture focusing on mass markets	2	2	2	3	• "We developed after our IPO from a niche, differentiation strategy in Europe to a comprehensive global player" • Limited empirical evidence suggests mass market orientation of minor importance	Remove cultural element

Figure 38: Sub-node analysis on activities (1 of 4)

Activities	Empirical support				Excerpt of quotes and ladder elements / conclusion	Implication
	Firms	Interviews	Ladder elements	Ladder		
24. Decompose and reconstruct value chain	4	7	9	10	• "We run a very interesting production network allowing us to specializing single plants on specific tasks" • "We will not produce in Asia. 90% of material is from Europe. All is assembled here … the combination of brand, quality perception and our cost structure allows us good profits" • "We are completely autonomous as we cover the complete value chain, thus we don't need to tell anybody what to do as we can do it ourselves" • 'Focus on essential platform components' and 'mass production of components' in less expensive Asian plants	Retain activity
25. Collaborate in self managed teams and flat hierarchies	3	7	6	6	• 'Breaking with Taylorism and fostering work in autonomous groups' • 'Flat hierarchies', 'flat management culture and direct communication' • "An advantage of all our expert know-how is that we have very flat hierarchies enabling everybody to discuss with everybody else. One disadvantage, however, is that this flat hierarchy combined with our low fluctuation is to retain employees who want to make career. This is the challenge"	Retain activity
26. Network with external partners	1	1	0	0	• Only one participant emphasized collaboration with external research partners	Remove activity
28. Share and reuse knowledge	0	0	0	0	• -	Remove activity
29. Educate and motivate employees	3	5	3	3	• "We are a firm which pays relative to competitors higher wages on lower levels and on average lower wages on management level" • "I don't know if you know that we invented working time accounts in Germany" • 'Motivated, capable employees with a high degree of education', 'development opportunities within the firm' and 'offer working time models'	Retain activity
30. Involve and empower employees	3	6	6	7	• "Chance to take over topics, which do not belong to your functional responsibility" • 'Involve and empower employees', 'employees participate in decision making process of the firm', 'management creates room for development'	Retain activity
32. Apply sophisticated manufacturing technology	3	5	7	4	• 'Technology push', 'technology vision', 'capability to develop technologies', 'proprietary development', 'additive manufacturing in mass customization' • We apply mass customization of products meaning that customers order a standard product which we customize to his specific needs by adding customized components. Practically, we use mass production or mass produced components for our custom solution"	Retain activity

Figure 39: Sub-node analysis on activities (2 of 4)

Activities	Empirical support				Excerpt of quotes and ladder elements / conclusion	Implication
	Firms	Interviews	Ladder elements	Ladder		
33. Apply ICT for coordinating internal system and external value chain	0	0	0	0	• -	Remove activity
35. Apply selective outsourcing of customer neutral, standard, non-specific components	2	4	3	1	• "The big struggle is about the digital core [the micro processor]" • "Some parts we purchase or licence from external partners" • Only two firms supporting this capability	Remove activity
37. Focus on architecture and processes, not products	5	11	19	20	• "Indeed it was a kind of process development, however, we didn't call it that way as it sounds not very 'sexy' – actually, I think this wasn't available at all at that time" • "We have enough patience to let processes develop and grow" • 'Highly sophisticated innovation process management', 'process development', 'process and processing expertise', 'process platform', 'modular architecture', 'assembly platform', 'product architecture'	Retain activity
38. Concurrently plan, develop and engineer	0	0	0	0	• -	Remove activity
39. Continually improve operations	5	10	10	9	• "We apply lean management practices in all business functions, not just manufacturing" • "It is this kind of Swabian self-critique and modesty. We are not celebrating ourselves as the greatest, rather we seek to get an understanding of how to further improve" • 'Cross-functional change function for process and product changes', 'evolutionary projects for processes and materials', 'continuous product improvement'	Retain activity
40. Early involve manufacturing	1	1	1	1	• "[Manufacturing] is represented and possesses an equal voting right in product development"	Remove activity
41. Apply customer information in R&D	5	8	9	8	• "We collaborated closely with acousticians in order to understand what they do and what they need … we are still very strong in doing so by having people from marketing and development close working together with our clients" • 'Test new products with selected customers', 'customer testing during development phase', 'product development close to customer', 'joint product development with customers'	Retain activity

Figure 40: Sub-node analysis of activities (3 of 4)

Activities	Empirical support				Excerpt of quotes and ladder elements / conclusion	Implication
	Firms	Interviews	Ladder elements	Ladder		
42. Apply preventive, upfront measures for improvement or acceleration	2	3	3	5	• "Absolutely clearly, if a product suffers from overall quality and performance deficiencies, it will never be a success. In order to avoid that, it has to be properly developed" • 'Preventive stress test in process development', 'early development in science and technology for pre-validation of customer value', 'quality of R&D driver for market success'	Remove activity
43. Inbound logistics	1	1	0	0	• Anecdotal evidence on advantages in purchasing and selecting material due to market volume	Remove activity
45. Focus on manufacturing technology	5	9	8	10	• "I think we achieved to use many processes in series production five to ten years before competitors" • 'Manufacturing systematic', 'process related differentiation', 'synchronous production', 'modular production structure', 'pioneer in production technologies'	Retain activity
46. Continuously improve operations	4	8	5	3	• "No firm of this size can properly operate if it is not improving its processes and enhancing its structures" • 'Innovative technological leaps', 'continuous improvement capability'	Retain activity
47. Apply customer information in manufacturing	1	2	3	2	• 'In-ear customization in country subsidiaries', 'digitally cast ear canal for ergonomically fitting to customer specifics', 'acoustician can adapt devices to specific customer needs' • Strong indirect relationship with 52./53. requiring 47. for including customer information in product design; thus, retaining the sub-node	Retain activity
48. Integrate product development and marketing with production planning and operations	3	5	5	3	• "Manufacturing Engineering … took over task from R&D to transfer products into manufacturing and develop manufacturing processes together with designers. This is, at least what I hear, something competitors didn't solve that elegantly" • 'Manufacturing involved in product development', 'integration of product and process development', 'manufacturing engineering', 'design and processes are mutually dependent on each other'	Retain activity
49. Invest long-term in manufacturing and ICT	1	1	1	1	• Only one participant stating 'production assets' • Anecdotal evidence	Remove activity

Figure 41: Sub-node analysis of activities (4 of 4)

Activities	Empirical support				Excerpt of quotes and ladder elements / conclusion	Implication
	Firms	Interviews	Ladder elements	Ladder		
52. Establish close customer relationship	5	9	24	16	• "For the future an obvious success factor is to intensify customer oriented collaboration and to further integrate into customer's processes and procedures" • „Our customers want to provide feedback. They want to contribute their knowledge, which is a wonderful treasure, a source of advantage in the market" • 'Customer proximity to customer', 'personal customer contact across all hierarchy levels', 'long-term customer relationship', 'international sales competence', 'stronger customer orientation through own retail business'	Retain activity
53. Capture customer needs and focus on perceived customer value	5	12	23	19	• "The topics of proximity to markets and customers as well as understanding the products practical use is extremely important. … Thus, explaining the customer how to apply the products but as well understanding how customers apply them" • "This has nothing to do with technical innovation - it is just a flexible tube. However, it is consequently thought from the customer who uses our machine and thus they are convinced by the additional value to pay a price premium" • 'Details of customer perception', 'understanding market needs of retailers and customers', 'customer in focus', 'highest product quality', 'customer perceived innovation capability', 'joint customer benefit identification', 'marketing from customer value', 'understanding customer needs'	Retain activity
54. Apply ICT to quickly collect, aggregate and analyse customer information as well as disseminate it across functions and teams	2	3	2	1	• "Market pull and market push … here is again our systematic approach important as we have internal systems – not just IT but also business processes – established allowing us to bringing together both" • 'Systematically collect customer and sales information', 'Apply additional tools in sales' • Only three interviewees of two firms	Remove activity
55. Continually measure, analyse and exchange knowledge on customers	0	0	0	0	• -	Remove activity
56. Research competitor and market information	2	3	0	1	• "There are also much smaller competitors we benchmark" • "We check what the competitors do as they sometimes have also good ideas" • "Marketing observes the market and position our products accordingly"	Remove activity
57. Market research with focus on customer needs	0	0	0	0	• -	Remove activity

Figure 42: Sub-node analysis of underlying concept and activities (1 of 3)

Activities	Empirical support				Excerpt of quotes and ladder elements / conclusion	Implication
	Firms	Interviews	Ladder elements	Ladder		
60. Increase sales volume through customer satisfaction	5	10	24	48	• „We produce a relative high volume, actually this volume is for our market enormous even if it is compared to the global photo market relatively small. I think, however, that we really have a totally different pricing structure. We can charge up 30% sometimes even up to 50% premium compared to our competitors" • "In sales we sometimes call our distribution partners also customers … the distribution partner is typically satisfied when our products achieve higher end customer satisfaction in both the initial adaptation process as well as during the whole product lifecycle" • 'High demand', 'higher market share in our relevant markets', 'higher volume', 'benefit leadership', 'high scales', 'high customer satisfaction', 'best product for the customer', 'user satisfaction', 'market leadership in terms of volume', 'dominate our markets'	Retain underlying concept
61. Meet customer demands	5	12	48	39	• "Innovation is essential. If you look at the last 120 years it becomes clear that … all began with innovation and it is the central recurring theme since then" • "… cost leadership … this is not our focus, rather we concentrate on a benefit leadership. The customer and the application are central. The customer is buying our products because of our brand, but the brand signals our customers an extraordinary user friendliness" • 'Product quality', 'innovation', 'technology leadership', 'user friendliness', 'durability', 'highly efficient and effective products', 'higher customer value', 'flexibility and productivity', 'product reliability', 'customer specific adaptation', 'longevity of our products'	Retain activity driver
62. Customer involvement	3	3	2	5	• "It's obvious for the future that we need to intensify customer collaboration allowing us to integrate into the customers processes" • 'Customer involvement', 'involve customers'	Retain activity driver
63. Total customer cost	4	11	21	18	• "Everybody who starts a business with our machines, I would say 95% of all customers, are not falling flat on their face. If yes, I assume it wasn't the fault of our machines but rather the customer's management failure" • "Rental firms strongly consider 'return on invest' meaning that in case they pay 30% or higher prices for our products, than reliability and durability of our products need to be higher and service necessities correspondingly lower. An American colleague once told me, we are producing 'battle ships'" • 'Total return on invest higher', 'best picture at best cost', 'economic efficiency', 'lower cost for customers', 'lower total cost', 'low downtimes and product failures', 'tool for earning money', 'high value retention', 'long-run profits', 'low degree of rework', 'efficiency with acoustician'	Retain activity driver

Figure 43: Sub-node analysis of underlying concept and activities 2 of 3)

Activities	Empirical support				Excerpt of quotes and ladder elements / conclusion	Implication
	Firms	Interviews	Ladder elements	Ladder		
65. Economies of substitution -Explicit mentioning	1	1	0	0	• "Till the turn of the millennium we exclusively focused on high-end products. Then we got into trouble as many other firms as well. As a consequence our management decided to extend the range of our portfolio to lower price segments. … As we acquired another firm, we took another groundbreaking decision for saving development cost and thus, focused on product platforms allowing to saving development cost. We used to say 'same kitchen different restaurant'"	Remove driver; specific indicator for SQHS
-Non-explicit mentioning	0	0	0	0	• 'Modular production architecture', 'flexibility and adaptability of devices', 'assembly in country sales organisations', 'mass customizing of products in sales', 'process platform', 'focus on specific product components', 'assembly platform', 'platform strategy', 'adaptability to customer needs'	
66. Economies of variety -Explicit mentioning	1	4	4	14	• "… the plant is producing standard components, which can then be customized from a variety of three earpieces, sixteen colours and an earmold. The earmold is necessary in each case, it just differs if it is specific to the customer or is simply standard"	Retain activity driver
-Non-explicit mentioning	2	4	32	6	• 'Modular production architecture', 'flexibility and adaptability of devices', 'assembly in country sales organisations', 'mass customizing of products in sales', 'process platform', 'focus on specific product components', 'assembly platform', 'platform strategy', 'adaptability to customer needs	
67. Economies of quality -Explicit mentioning	3	4	3	7	• "Our employees in manufacturing are more critical than necessary. However, this is an enormous potential we posses, which we should not risk damaging" • „We achieved high levels of quality in production"	Retain activity driver
-Non-explicit mentioning	5	12	69	10	• 'Improve customers in their respective context', 'pre-tests with customers on new product introductions (win-win)', 'we discuss product innovations with selected customers', 'extreme lean management philosophy', 'understanding our customers', 'more information on our customers', 'close collaboration with our customers'	
68. Economies of speed -Explicit mentioning	2	4	2	2	• "I think that our profitability is significantly higher than our competitors'. Or put differently, on the one side we have significantly higher R&D expenditures of 6.5-9.5% compared to our competitors' 3%. This 3.5-6.5% are economically speaking additional cost. Thus, our costs are relatively higher than our competitors"	Retain activity driver
-Non-explicit mentioning	5	8	22	2	• 'Technological vision', 'innovation/patents', 'innovation capability', 'continuous improvement', 'technological leader', 'focus on innovation', 'speed', 'innovation process', 'innovation management', 'customer perceived innovation', 'fast product introductions'	

Figure 44: Sub-node analysis of underlying concept and activities (3 of 3)

Activities	Empirical support				Excerpt of quotes and ladder elements / conclusion	Implication
	Firms	Interviews	Ladder elements	Ladder		
70. Economies of scope						
-Explicit mentioning	0	0	0	0	• No direct mentioning; concept probably unknown by interviewees	Retain activity driver
-Non-explicit mentioning	4	9	9	27	• Neither in interviews nor ladders directly mentioned, however, e.o. scope result from high market shares indicated by 9 interviews from 4 firms in 9 ladder elements	
72. Economies of scale						Retain activity driver
-Explicit mentioning	2	2	3	1	• "I think that … we are still very, very good in terms of economy of scales" • "Globalisation – as said – in three dimensions: distribution, value chain, full product portfolio. All that belongs to each other or is interdependent, but has the effect that our market share increased from 6-7% to up to 25%. And behind market share are production numbers and production numbers lead to economies of scale"	
-Non-explicit mentioning	4	9	9	27	• In addition and same as for e.o. scope, e.o. scale result from high market shares indicated by 9 interviews from 4 firms in 9 ladder elements	
73. Labour cost	0	0	0	0		Remove activity driver
74. Complexity	2	2	3	1	• "One of our biggest challenges is to assure our flexibility and speed while our growth inevitably requires group-like structures" • 'Complexity through modular production', 'comprehensive product portfolio', 'higher cost'	Remove activity driver
75. Risk	0	0	0	0		Remove activity driver
76. Capital cost	0	0	0	0		Remove activity driver

C. Analysis of empirically revised synthesized HS model

In this chapter, the new model is first structurally analysed before a detailed analysis on ladder elements and ladders allows identifying key elements and relations required for successfully establishing HS. Thus, first a general understanding of the essential building blocks is attained before second, the importance of individual elements as well as their relationships are analysed.

In this line of reasoning, ladder elements (LE) represent the constituent parts of ladders and enable to determine the most important common activities, capabilities or resources of HS. Contrary, elements in ladder analysis (LA) are restricted as redundant ladder elements in one ladder are considered only once. Consequently, elements of LA are a subset of elements considered in LEA. Furthermore, all subsequent analyses are restricted to elements included in the revised model shown in figure 45.

C.1. Structural analysis

C.1.1 Operational resources

Major changes of operational resources result from a strong empirical emphasize on the intangible resource ‘brand’ as well as the human resource ‘employee motivation and qualification’. Thereby, the resource brand is strongly linked with the activity of ‘positioning and aligning brand with customer perceived value’. In this line of reasoning, the firm’s brand is representing important firm and product values such as best quality, innovation, or variety sought and perceived by customers.

Further, the human resource of ‘motivated and qualified employees’ is dependent on a firm’s HR management activities such as ‘educating and motivating employees’ and ‘involving and empowering employees’. Furthermore, it relates to the HR activity of ‘attracting talents and developing employer reputation’ underpinning activities’ characteristic to not only deploy but also shape the development of resources.

FIGURE 45: EMPIRICALLY REVISED SYNTHESIZED HS MODEL

	Underlying concept	Activity drivers	Common activity system and activities	Common resources and capabilities
Differentiation.	High product price N9 – explicit 1N9 – indirect Increase sales volume through customer satisfaction 60 – explicit 160 – indirect	Customer demands 61 – explicit 161 – indirect Customer involvement 62 – explicit 162 – indirect 63. Total customer cost	I.1. Firm infrastructure 24. Decompose and reconstruct value chain 25. Collaborate in self managed teams and flat hierarchies I.2. HR management N4. Attract talents and develop employer reputation 29. Educate and motivate employees 30. Involve and empower employees I.3. Technology 32. Apply sophisticated manufacturing technology II.1. Research and Development 37. Focus on architecture and processes, not products 39. Continually improve products and processes 41. Apply customer information in RD II.3. Operations 45. Focus on manufacturing technology 46. Continuously improve operations 47. Apply customer information in manufacturing 48. Integrate product development and marketing with production planning and operations II.5. Marketing and sales N6. Position and align brand with customer perceived value N7. Focus on enabling customers in applying products 52. Establish close customer relationship 53. Capture customer needs and focus on perceived customer value II.6 Service N8. Apply service to ensure or quickly restore product usability 59. Establish close customer relationship	Operational resources N1. Strong brand *N1* N2. Motivated and highly qualified employees 2. Sufficient and long-term investment Operational capabilities N5. Capability to innovate and generate customer perceived value 6. Capability to operate flexible, computer integrated manufacturing 7. Organizational and individual learning capability 8. Capability to sense and respond to customer preferences Management capabilities N3. Capability to pragmatically execute 10. Capability to manage system based 12. Capability to identify, evaluate and capture market opportunities 13. Capability to educate and sustain employees 14. Capability to provide objectives and incentives for clear orientation Company culture 18. Culture fostering employee commitment to HS concept and customer satisfaction 19. Culture fostering customer orientation and change affinity 20. Culture fostering collaboration and knowledge exchange 21. Culture fostering long-term orientation
Cost decreasing effects	Direct cost reductions through concept specific economies Direct cost reductions through utilizing concept specific quasi-public goods Indirect cost reductions through differentiation induced volume increases	Economies of - Variety 66 – explicit 166 – indirect - Quality 67 – explicit 167 – indirect - Speed 68 – explicit 168 – indirect Economies of scope 70 – explicit 170 – indirect Economies of scale 72 – explicit 172 - indirect		

C.1.2. Operational capabilities

Two types of modifications resulted from the empirical data: first, establishing the new capability 'innovate and generate customer perceived value' and second, removing the capabilities 'to implement and operate ICT' as well as the 'informational and analytical capability to process and analyse information'.

The new capability is directed towards innovation, however, with a specific focus on generating customer perceived value. This extensive customer orientation is apparent in most categories besides operational resources, firm infrastructure, HR management and technology. In consequence, consistent customer focus across the firm's value chain seems to be central for successful HS firms. In particular, this is underpinned by a management capability 'to identify, evaluate and capture market opportunities' and a firm culture emphasizing 'customer orientation and change affinity'. Furthermore, 'applying customer information' in RD as well as operations activities, or MS activities 'focusing on enabling customers in using the products', 'establishing close customer relationships for collecting information and feedback', and 'capturing customer needs with focus on customer perceived value' support this customer orientation. Even the firm's services have a major focus on 'building close customer relationships' and to increase customer value by 'applying service to ensure or quickly restore product usability'. Thus, one interviewee stated as a central cornerstone of their HS 'to put yourself in the shoes of the customer and consider their point of view'.

Both not empirically supported capabilities are related to information and communication. The lack of empirical support of ICT is consistent across activities as no theorized ICT activities were sustained and no additional capabilities or activities are mentioned. Consequently, related activities such as 'apply ICT for coordinating internal system and external value chain', 'invest long-term in ICT' and 'apply ICT to quickly collect, aggregate and analyse customer information as well as disseminate it across functions and teams' were removed.

C.1.3. Management capabilities

The new capability 'to pragmatically execute' is also linked to the central theme 'customer focus' as most interviewees relate this capability to dedicating more of the firm's power to customer perceived value, accelerate decisions and speed up execution.

The capability ‘to manage, combine and integrate knowledge’ did not receive empirical support. This is in line with a lack of support for the HR activity of ‘sharing and reusing knowledge’ as well as the knowledge oriented activities in MS of ‘continually measure, analyse and exchange knowledge on customers’, ‘research competitor and market information’ and ‘research with focus on customer needs’. Nevertheless, firms consider collaboration and knowledge exchange important – as indicated by the empirical support for ‘culture fostering collaboration and knowledge exchange – even if not as a specific capability. Consequently, it seems that HS firms are less concerned about the capability to manage customer and market data from primary and secondary sources than to establish a culture focusing on customer orientation and activities for collecting specific customer information in terms of their products, services and innovations. As no empirical support is provided for the capability ‘to build long lasting customer relationships’, however, this is less considered a capability than an cultural characteristic underpinned by specific customer oriented activities. Indeed, specific activities in RD and operations such as ‘applying customer information’, or in MS and service such as ‘establish close customer relationship’ or ‘capture customer needs’ are emphasized.

In addition, empirical responses lead to exclude the capability ‘to integrate external partners’. Likewise, the activity in firm infrastructure of ‘network with external partners’ and the activity in purchasing ‘applying selective outsourcing of customer neutral, standard, non-specific components’ were excluded, altogether indicating that neither the capability nor the activity are common elements required for realizing HS.

One management capability empirically supported by focussing on particular, customer value generating activities as well as orchestrating the overall value chain across geographies is ‘to manage system based’. This is strongly related to the firm infrastructure activity of ‘decomposing and reconstructing value chain’ as well as the RD activity of ‘focusing on architectures and processes’. Furthermore, a link exists to the manufacturing related capability ‘to operate flexible, computer integrated manufacturing’, the manufacturing activity of ‘focus on manufacturing technology’ and a technology related activity of ‘apply sophisticated manufacturing technology’. Altogether, this emphasizes the importance of a firm’s capabilities and activities in orchestrating its value chain and correspondingly developing modular processes, particularly in manufacturing and product architecture. Thus, customer needs predetermined by MS and service can finally be fulfilled.

Further, support is provided for the capability ‘to identify, evaluate and capture market opportunities’ already mentioned in context with customer centricity. However, interviewees stressed the additional aspect of reacting – appropriately and quickly – on opportunities and change requirements. Another retained capability is ‘to educate and sustain employees’ closely related to the HR management practices of educating, motivating, involving and empowering employees. Additionally, this leads to further strengthening the importance of the operational resource of employees’ motivation and qualification.

Somehow loosely linked to resources, capabilities and activities on ‘employees’ is the next capability ‘to provide objectives and incentives for clear orientation’ as this provides incentives and awards performance. Thus, interviewees state ‘performance orientation’, ‘performance objectives’, ‘monitoring’ and ‘management focus’ as essential capabilities.

C.1.4. Company culture

Of all theoretically derived categories cultural characteristics received most empirical support. The only exception was the cultural element ‘focusing on mass markets’. A possible explanation could be that the firm’s mass market orientation is so obvious – as indicated by the evident market share leadership of the firms, that interviewees not explicitly raising that point. Consequently, only one interviewee mentioned that topic in context of adapting their strategy from a pure differentiation to a mass market orientation.

The remaining empirically supported characteristics support the already above explicated employee and customer orientation. Furthermore, a collaborative company culture is explicated leading to emphasize employee orientation. Moreover, the firms’ culture is characterised by a long-term orientation granting on the one hand security for employees and providing on the other hand a basis for long-term developments of products and markets. Thus, the firms actions are rather long-term, customer oriented than short-term profit oriented. One interviewee stated that they are rather focussing on relationships than on quarterly financial reports. For all but one firm private ownership provides the basis for this long-term orientation.

C.1.5. Firm infrastructure

Two activities are empirically evident: first, ‘decompose and reconstruct value chain’ and second, ‘collaborate in self-managed teams and flat hierarchies’. While the first, as already mentioned above, is

related to a firm's value chain evaluation and manufacturing capabilities and activities, the second is linked to the firms' HR management supporting employee motivation, involvement and empowerment.

C.1.6. TECHNOLOGY

As already explicated above, while retaining the activity 'apply sophisticated manufacturing technology' essential for fulfilling customer needs, the activity 'apply ICT for coordinating internal system and external value chain' is removed due to lack of empirical support.

C.1.7. PURCHASING

No support is provided for 'applying selective outsourcing of customer neutral, standard, non-specific components'. This is less than expected as the value chain capability as well as architecture activities receive empirical support. One possible explanation is based on the non-differentiating nature of externally supplied standard, non-specific components perceived by interviewees as common not worth to specifically mention it.

C.1.8. RESEARCH AND DEVELOPMENT

Only two of six activities in RD – 'concurrently plan, develop and engineer' and 'early involve manufacturing'– lack empirical support. Low support of both activities could be caused by overlapping with the manufacturing activity of 'integrate product development and marketing with production planning and operations'. Consequently, removing the activities is less an exclusion than a structural revision of the theoretically derived model.

Activities supported by empirical data are 'focus on architecture and processes', which is assigned to both realize customer needs and lower cost. Connected with this activity are two of the remaining three RD activities 'apply customer information in RD' and 'continually improve products and processes'. Both are based on modular principles applied in product and process development allowing testing new products or even to jointly developing them with customers. The last remaining activity 'apply preventive, upfront measures for improvement or acceleration' is oriented to fulfilling customer needs. This activity is related to the two manufacturing activities 'continuously improve operations' and 'integrate product development and marketing with production planning and operations' as both are directed to quality of the fulfilment process.

C.1.9. Operations

All theoretically derived activities in operations receive empirical support. Thereby, ‘focussing on manufacturing technology’ aims at providing the necessary flexibility for ‘applying customer information in manufacturing’ indicating that both are directed to fulfil customer needs. As already stated in RD, the remaining two activities in operations relate to achieving high levels of process and product quality. Accordingly, one interviewee explained that “manufacturing engineering … took over the task from RD to transfer products into manufacturing and develop manufacturing processes together with designers” as design and processes are mutually dependent on each other and influence quality.

C.1.10 Marketing and sales

Four of the six originally included activities are not empirically supported. As explained above, all exclusions relate to either ICT or to knowledge management. The remaining two empirically evident activities ‘establish close customer relationship’ and ‘capture customer needs and focus on perceived customer value’ are linked to customer centricity. In addition, two new activities ‘position and align brand with customer perceived value’ and ‘focus on enabling customers in applying products’ appeared. The first, however, is an activity seeking to locate the brand’s value proposition close to customers’ expectations and thus is oriented to customer centricity. Contrary, the second is focusing on enabling the customer in using the firm’s products and services and thus, extending the firms’ capabilities and activities in fulfilling customers’ needs.

C.1.11. Service

Similar to the above mentioned MS activity ‘focus on enabling customers in applying products’ the new activity ‘apply service to ensure or quickly restore product usability’ is directed to fulfill customer needs. Thus, HS firms are considering quality neither in terms of products nor in terms of services but consider all value chain steps relevant for increasing customers’ total value.

Furthermore, the new service activity ‘establish close customer relationship’ consisting of two distinct parts ‘information collection’ and ‘customer proximity’ evolved from the data. This new activity is evidently linked to customer centricity further strengthening the importance of this construct for achieving HS.

In summary, the structural analysis of the empirically revised model reveals three distinct building blocks of HS. First, *customer centricity* focusing on considering the firms' structure, processes, products and services from a customer perspective gained through customer intimacy established by close relationships and intense customer involvement. This is documented by a wide range of firm capabilities and activities focusing on customers and ranging from operational resources and capabilities, management capabilities, cultural characteristics to activities in nearly all value chain steps. The second building block is a comprehensive *employee orientation* focusing on educating and motivating employees through specific capabilities allowing familiarizing with employees, specific HR management activities such as employee education, involvement or empowerment, or specific firm infrastructure activities such as self-managed teams and flat hierarchies. Third, keeping the firms' promises made through its brand and its quality, innovation or variety reputation or put differently, *fulfilling customers needs*. This last building block falls into two parts. First, the foundation for flexibly designing and manufacturing products based on modular principles and a strong value chain orientation and second, enabling the customer in using the product to realize its full benefit.

Before concluding this subchapter, a brief analysis of the empirical support of the underlying concept and activity drivers is required. All theoretically derived conceptual elements and activity drivers received empirical support besides the category of 'cost increasing effects'. Potential causes could be the research approach focusing on the achievements rather than the failures, cost and shortcomings within the firms or interviewees not considering the negative cost due to HS concepts' immanent compensation resulting in a positive net result. Due to lack of empirical support these effects are excluded. In contrast, due to empirical support the additional conceptual element 'high product prices' is completing the HS model.

The next subchapter provides a detailed analysis on first, the importance and second, the relationships of activities, capabilities and resources of HS. In the ladder element analysis (LEA), all elements are considered for determining the overall importance, while in ladder analysis (LA) redundancies are eliminated and only elements included and related to each other in ladders are focused. Overall, the revised model comprises 602 or 95% of a total 631 LEA elements and thus, represents empirical data well.

C.2. Analysis of ladder elements (LEA)

LEA follows two steps: First, evaluating the level of analysis, which can be either the interviewee or the firm level. Second and based on that, identifying the most important, common HS activities, capabilities and resources.

C.2.1. Identifying the analysis object for LEA

The twelve participants from 5 different firms mentioned the revised model elements 602 times: 147 or 24% to resources and capabilities, 179 or almost 30% to activities and 276 or 46% to activity drivers. The resulting Figure 46 presents the resulting correlation matrix showing a low to medium but in general positive relationship ranging from -0.03 to +0.83.

	1.1	1.2	1.3	2.1	3.1	3.2	3.3	4.1	5.1	5.2	5.3	5.4
1.1	1											
1.2	0,24	1										
1.3	0,50	0,18	1									
2.1	0,61	0,28	0,45	1								
3.1	0,46	0,11	0,33	0,68	1							
3.2	0,68	0,00	0,34	0,61	0,75	1						
3.3	0,55	0,15	0,29	0,71	0,83	0,74	1					
4.1	0,19	-0,03	0,10	0,23	-0,01	0,18	-0,01	1				
5.1	0,17	0,05	0,11	0,18	0,11	0,24	0,22	0,47	1			
5.2	0,21	-0,04	0,07	0,09	0,19	0,13	0,20	0,40	0,43	1		
5.3	0,50	0,10	0,24	0,53	0,70	0,69	0,77	0,24	0,43	0,49	1	
5.4	0,37	0,02	0,24	0,34	0,45	0,44	0,49	0,37	0,58	0,71	0,65	1

FIGURE 46: LEA CORRELATION ANALYSIS – INTERVIEWEE LEVEL

Only 18 of the 78 correlation coefficients exceed 0.5. Strong and medium correlations exist for firms three and five indicating that interviewees from both firms name and quantify similar elements as important. Furthermore, strong correlation exists between interviewees 1.1 and 2.1, 3.2 and 5.3, 2.1 as well as 5.3 and interviewees from firm three. In consequence, considering interviewees as separate units will result in overweighting those firms with multiple interviewees in the analysis. For avoiding this, the firm rather than an interviewee level seems appropriate requiring averaging data provided by interviewees of the same firm. In particular, this affects responses from firm one, three and five. The corresponding firm level correlation matrix in figure 47 still shows low to medium relationships with only three out of ten correlations above 0.5 ranging in total from -0.1 to +0.7. A medium correlation of 0.72 is only found for firm 2 operating in the cleaning machine industry and firm 3. Figure 47 provides a correlation overview on firm-level LEA applied in the following.

	F1	F2	F3	F4	F5
F1	1				
F2	0,62	1			
F3	0,51	0,72	1		
F4	0,13	0,22	0,06	1	
F5	0,28	0,32	0,48	0,46	1

FIGURE 47: LEA CORRELATION ANALYSIS – FIRM LEVEL

C.2.2. ANALYSING LE

After firm level consolidation, the 52 ladder elements retained in the empirically revised HS model are mentioned 252 times ranging from a low of 32 to a high of 68 per interviewee. On average each of the 52 ladder elements was stated between 0.6 and 1.3 times by each of the interviewees leading to a median of 0.33 and 1. The maximum amount of one ladder element stated by a single interviewee or in case of firm level aggregation by a single firm ranges from 3.0 to 9.7. Figure 48 presents an overview on descriptive statistics, while figure 49 provides an overview on firm-level LEA.

	F1	F2	F3	F4	F5
Mean	1,12	0,88	0,93	0,62	1,29
Median	1	1	0,33	0	1
Standard Deviation	1,20	1,22	1,64	0,87	1,67
Range	5,33	5,00	10,00	3,00	9,67
Minimum	0	0	0	0	0
Maximum	5,33	5,00	10,00	3,00	9,67
Sum	58,33	46,00	48,33	32,00	67,33
Count	52	52	52	52	52

FIGURE 48: DESCRIPTIVE STATISTICS OF FIRM-LEVEL LEA

As shown in figure 48, 115 or 45% of the total 252 LE are assigned to underlying conceptual drivers, thus the majority of assigned LE is from a critical realist point of view either an actual or an empirical event. However, as only a minority of 47.7 of the 115 LE is stated explicitly their share drops to only 25.8%. Considering this kind of indirect inclusion is required as otherwise the lack of knowledge on underlying conceptual drivers such as economies of substitution or variety leads to falsely excluding essential elements.

FIGURE 49: OVERVIEW ON FIRM-LEVEL LEA

Elements	Total	F1	F2	F3	F4	F5	% Sub-Cat	%sSub-Total	%Cat-Total	% Total
Resources and Capabilities	**67,0**	**13,7**	**12,0**	**4,0**	**8,0**	**9,0**				**26,6%**
Operational Resources	11,3	2,3	4,0	2,0	2,0	1,0			4,5%	
N1. Brand	5,0	1,0	2,0	1,0	1,0	0	44,1%	2,0%		
N2. Motivated and highly qualified employees	2,3	0,3	1,0	0,3	0	0,7	20,6%	0,9%		
2. Sufficient and long-term investments	4,0	1,0	1,0	0,7	1,0	0,3	35,3%	1,6%		
Operational Capabilities	12,7	5,0	1,0	1,0	2,0	3,7			5,0%	
N5. Capability to innovate and generate customer perceived value	3,7	0,7	0	0,3	1,0	1,7	28,9%	1,5%		
6. Operate stable, but flexible computer integrated manufacturing	5,0	3,0	0	0	1,0	1,0	39,5%	2,0%		
7. Organizational and individual learning and align internal operations accordingly	3,0	1,0	1,0	0,3	0	0,7	23,7%	1,2%		
8. Capability to sense and respond to customer needs	1,0	0,3	0	0,3	0	0,3	7,9%	0,4%		
Management Capabilities	22,7	6,3	7,0	1,0	4,0	4,3			9,0%	
N3. Capability to pragmatically execute	6,7	0,3	4,0	0,3	2,0	0	29,4%	2,6%		
10. Capability to manage system based	2,7	0,3	0	0	1,0	1,3	11,8%	1,1%		
12. Capability to identify, evaluate and capture future market opportunities	5,0	1,0	1,0	0,7	1,0	1,3	22,1%	2,0%		
13. Capability to educate and sustain employees	3,7	2,3	0	0	0	1,3	16,2%	1,5%		
14. Provide clear orientation through objectives and incentives	4,7	2,3	2,0	0	0	0,3	20,6%	1,9%		
Company Culture	20,3	4,0	6,0	4,7	1,0	4,7			8,1%	
18. Culture fostering employee commitment to HS concept and customer satisfaction	5,0	0,3	1,0	2,0	0	1,7	24,6%	2,0%		
19. Culture fostering customer orientation and change affinity	2,7	0	1,0	0,7	0	1,0	13,1%	1,1%		
20. Culture fostering collaboration and knowledge exchange	9,7	2,7	3,0	1,3	1,0	1,7	47,5%	3,8%		
21. Culture fostering long-term orientation	3,0	1,0	1,0	0,7	0	0,3	14,8%	1,2%		
Activities	**70,3**	**18,3**	**7,0**	**14,0**	**10,0**	**21,0**				**27,9%**
Firm Infrastructure	5,0	2,0	0,0	0,3	0,0	2,7			2,0%	
24. Decompose and reconstruct value chain according to customer specific and customer neutral activities	3,0	1,3	0	0	0	1,7	60,0%	1,2%		
25. Collaborate in self-managed cross-functional teams and flat hierarchies	2,0	0,7	0	0,3	0	1,0	40,0%	0,8%		
HR Management	4,0	1,7	0,0	0,7	0,0	1,7			1,6%	
N4. Attract employees and develop employer brand	1,0	0,3	0	0,3	0	0,3	25,0%	0,4%		
29. Educate and motivate employees	1,0	1,0	0	0	0	0	25,0%	0,4%		
30. Involve and empower employees	2,0	0,3	0	0,3	0	1,3	50,0%	0,8%		
Technology	2,3	1,3	0,0	0,0	0,0	1,0			0,9%	
32. Apply sophisticated manufacturing technologies	2,3	1,3	0	0	0	1,0	100,0%	0,9%		
Research and Development	15,3	2,3	1,0	2,3	3,0	6,7			6,1%	
37. Focus on architecture and processes, not products	9,0	1,0	1,0	0,3	3,0	3,7	58,7%	3,6%		
39. Continually improve products and processes	3,3	1,0	0	0,3	0	2,0	21,7%	1,3%		
41. Apply customer information in R&D	3,0	0,3	0	1,7	0	1,0	19,6%	1,2%		
Operations	8,3	3,0	0,0	0,3	2,0	3,0			3,3%	
45. Focus on manufacturing technology	3,3	1,3	0	0,3	1,0	0,7	40,0%	1,3%		
46. Continuously improve operations	2,3	1,0	0	0	1,0	0,3	28,0%	0,9%		
47. Apply customer information in manufacturing	1,0	0	0	0	0	1,0	12,0%	0,4%		
48. Integrate product development and marketing with production planning and operations	1,7	0,7	0	0	0	1,0	20,0%	0,7%		
Marketing and Sales	28,3	7,3	4,0	7,0	5,0	5,0			11,2%	
N6. Strongly position and align brand with customer perceived value	7,0	1,7	1,0	1,7	2,0	0,7	24,7%	2,8%		
N7. Focus on enabling customers	1,7	1,0	0	0	0	0,7	5,9%	0,7%		
52. Establish close customer relationship	10,7	2,7	2,0	2,0	2,0	2,0	37,6%	4,2%		
53. Capture customer needs and focus on customer perceived value	9,0	2,0	1,0	3,3	1,0	1,7	31,8%	3,6%		
Service	7,0	0,7	2,0	3,3	0,0	1,0			2,8%	
N8. Apply service to ensure or quickly restore product usability	3,7	0,3	1,0	1,7	0	0,7	52,4%	1,5%		
59. Establish close customer relationship	3,3	0,3	1,0	1,7	0	0,3	47,6%	1,3%		
Underlying concept and drivers	**114,7**	**22,3**	**21,0**	**25,7**	**13,0**	**32,7**				**45,5%**
High product prices	6,7	1,0	1,0	1,3	2,0	1,3			2,6%	
N9. High product prices	2,0	0	0	0,3	1,0	0,7	30,0%	0,8%		
1N9. High product prices_no ladder	4,7	1,0	1,0	1,0	1,0	0,7	70,0%	1,9%		
Increase sales volume through customer satisfaction	46,3	8,7	11,0	12,0	4,0	10,7			18,4%	
60. Customer satisfaction	11,3	1,7	2,0	1,3	3,0	3,3	24,5%	4,5%		
160. Increase sales volume through customer satisfaction_no ladder	5,3	0,7	1,0	1,7	1,0	1,0	11,5%	2,1%		
61. Meet customer demands	19,3	5,0	5,0	5,0	0	4,3	41,7%	7,7%		
161. Meet customer demands	0,7	0	0	0,3	0	0,3	1,4%	0,3%		
62. Customer involvement	1,3	0,3	1,0	0	0	0	2,9%	0,5%		
63. Total customer cost	8,3	1,0	2,0	3,7	0	1,7	18,0%	3,3%		
Direct cost reductions through concept specific economies	52,0	11,3	7,0	10,3	5,0	18,3			20,6%	
66. Economies of integration through direct customer interaction	1,3	0,3	0	0	0	1,0	2,6%	0,5%		
166. Economies of variety_no ladder	12,7	0	0	0	3,0	9,7	24,4%	5,0%		
67. Economies of quality through product conformity to customer specifics	1,0	1,0	0	0	0	0	1,9%	0,4%		
167. Economies of quality_no ladder	27,0	4,3	5,0	10,0	1,0	6,7	51,9%	10,7%		
68. Economies of speed through shortened development time	0,7	0,3	0	0	0	0,3	1,3%	0,3%		
168. Economies of innovation_no ladder	9,3	5,3	2,0	0,3	1,0	0,7	17,9%	3,7%		
Direct cost reductions through utilizing concept specific quasi-public goods	3,7	0,7	1,0	1,0	0,0	1,0			1,5%	
170. Economies of scope_no ladder	3,7	0,7	1,0	1,0	0	1,0	100,0%	1,5%		
Indirect cost reductions through differentiation induced volume increases	6,0	0,7	1,0	1,0	2,0	1,3			2,4%	
72. Economies of scale through differentiation induced volume increases	2,3	0	0	0	2,0	0,3	38,9%	0,9%		
172. Economies of scale_no ladder	3,7	0,7	1,0	1,0	0	1,0	61,1%	1,5%		
Total	**252,0**	**57,0**	**44,0**	**46,8**	**31,7**	**65,8**		**100,0%**	**100,0%**	

Independent of that, however, with 67 LE on capabilities and 70 LE on activities both are similarly distributed. On the other hand, their percentage considerably varies in amount based on including or excluding non-explicit mentioning of conceptual drivers. While including indirect conceptual drivers leads to a share of 27% and 28% for resources and capabilities, and activities respectively, excluding results in a much higher proportion of 36% and 38%. This distortion is, however, of subordinate importance as the focus of this research is on real generative mechanisms at the level of activities, capabilities and resources. Therefore a relative instead of absolute analysis is applied based on including indirect conceptual drivers. In order to proceed narrowing the most important activities, capabilities and resources of HS a focus is set on the most contributing elements. Therefore, a cap of a minimum of 2% of individual contribution from a single element to the overall model is applied. Figure 50 presents the most contributing 10 elements explained in the following.

10 Most Contributing Individual Model Elements	Building block	Total	%Sub-Total
Resources and Capabilities			
Operational Resources		**36,33**	**14,4%**
N1. Brand	Customer centricity	5,00	2,0%
Operational Capabilities			
6. Operate stable, but flexible computer integrated manufacturing	Fulfillment of customer needs	5,00	2,0%
Management Capabilities			
N3. Capability to pragmatically execute	Fulfillment of customer needs	6,67	2,6%
12. Capability to identify, evaluate and capture future market opportunities	Customer centricity	5,00	2,0%
Company Culture			
18. Culture fostering employee commitment to HS concept and customer satisfaction	Customer centricity; employee orientation	5,00	2,0%
20. Culture fostering collaboration and knowledge exchange	Customer centricity; employee orientation	9,67	3,8%
Activities		**35,67**	**14,2%**
Research and Development			
37. Focus on architecture and processes, not products	Fulfilment of customer needs	9,00	3,6%
Marketing and Sales			
N6. Strongly position and align brand with customer perceived value	Customer centricity	7,00	2,8%
52. Establish close customer relationship	Customer centricity	10,67	4,2%
53. Capture customer needs and focus on customer perceived value	Customer centricity	9,00	3,6%
Total			**28,6%**

FIGURE 50: OVERVIEW ON 10 MOST CONTRIBUTING INDIVIDUAL MODEL ELEMENTS

With 11% of all LE activities MS is most cited. In particular, 'establish close customer relationship' (4.2%), 'capture customer needs and focus on customer perceived value (3.6%) and 'strongly position and align brand with customer perceived value' (2.8%) contribute to this result. This strongly supports one of the above explained central pillars of HS: 'customer centricity'. The remaining activity 'focus on enabling customers' contributes with 0.7% only a small proportion of the 11.2%.

LE referring to management capabilities amount to 9.0% ranking it second with individual capabilities contributing from 1.1% to 2.6%. Strongest contributors are 'capability to pragmatically execute'

with 2.6% and ‘capability to identify, evaluate and capture future market opportunities’ with 2.0% both underpinning the importance of customer orientation.

Cultural elements rank on third place with 8.1% of total LE. ‘Culture fostering collaboration and knowledge exchange’ as the second highest element contribution of 3.8% shows the importance of cultural characteristic for both employee orientation on the one hand and customer orientation through disseminating customer knowledge on the other hand. Another strong individual contribution results with 2.0% from a ‘culture of fostering employee commitment to HS concept and customer satisfaction’ related also to both employee and customer orientation.

With 6.1% of total LE statements RD rank on fourth place including with ‘focus on architecture and processes, not products’ (3.6%) the third highest contributing activity of all. This shows the importance of fulfilment of customer needs for HS.

Only two more elements – the operational resource ‘brand’ and the operational capability ‘operate stable, but flexible computer integrated manufacturing’ – contribute above the 2.0% limit used for identifying the most important HS elements in this research. While ‘brand’ is related mainly to customer orientation, the second is linked to fulfilment of predetermined customer needs.

In summary, the most contributing 10 activities, capabilities and resources posses the explanation power of 52.4% of all 35 elements assigned to those categories leading to conclude that they are central for realizing successful HS. With 7 elements representing 71% of the total contribution of the 10 most important elements ‘customer centricity’ seems to be the central pillar of HS. Thereby, this central theme consists of 52% of activities, 29% of cultural elements, and 10% of each capabilities and resources.

Moreover, with 29% the top 10 elements direct also to the second most important HS theme of fulfilling customer needs. This pillar rests either on capabilities (56%) or on activities (44%) with no cultural or resource elements included.

Furthermore, the third and according to individual contributions least important HS pillar ‘employee orientation’ seems to be linked to ‘customer orientation’ as elements related to the first are also directed to the second.

C.3. Analysis of ladders (LA)

C.3.1. Identifying analysis object for LA

LA focuses on identifying core relationships between the model's elements required for successfully realizing HS. Thus, ladders and not individual ladder elements as in LEA are the analysis object. Figure 51 provides an overview on the 61 elements stated 554 times and included in 79 ladders. Contrary to LEA requiring a restriction to only those elements included in the revised HS model, LA considers all elements for identifying relationships, even excluded ones. This corresponds to distinguish an elements importance – a fact deduced from the amount of elements stated – from the relationship between elements – inferred by an elements inclusion in a ladder representing its relational importance. For the latter, even elements with low or no overall importance can be essential. For that reason, also activity drivers are included in the analysis. Moreover, elements redundantly mentioned within one ladder are consolidated resulting in each element only once considered per ladder.

In addition and contrary to LEA, LA prohibits firm-level consolidation as otherwise bonds of ladders relations are breaking up. Furthermore, cross-ladder codings are excluded as only those elements assigned to ladders establish a reasonable degree of relationship with each other. Consequently, only 481 citations on 61 elements are subject to LA. The crucial relationships can be determined by identifying recurring elements presuming that all elements in one ladder are related to each other.

For an illustrative example of an interview generating two ladders and its corresponding coding see appendix 5.1. Furthermore, appendix 5.2 states for each of the alpha-numeric coding identifiers in figure 51 the corresponding elements based on the synthesized model.

Figure 51: Overview on ladders

Firm	Interviewee	Ladder name	Ladder no.	Content coding (additional information excluded)	Cross content coding (same numbers consolidated)
1	1	Innovation	1.1.1	13 N5 48 32 61 60 170 172	2 13 14 20 21
		Customer involvement	1.1.2a	8 41 62 61 60 170 172	
			1.1.2b	N2 15 52 53 54 61 60 170 172	
		Enablement	1.1.3	N2 N7 53 52 63 61 60 1N9	
		Brand	1.1.4	N1 N6 60 1N9	
		Customer proximity	1.1.5	13 52 61 60 1N9	
		Production	1.1.6a	6 39 45 167	
			1.1.6b	6 37 45 167	
	2	Innovation	1.2.1	6 29 32 45 46 61 60 1N9	2 14 18 20 21 N4 29 60
		Brand	1.2.2	N1 N7 N6 61 60 1N9	
		Lean	1.2.3	37 40 29 14 46 67	
		Efficiency	1.2.4	7 14 25 24 67	
	3	Brand	1.3.1	N1 N6 60 1N9 170 172	2 7 N3 14 12 13 20 22
		Benefit	1.3.2a	7 12 30 39 63 61 60 1N9 170 172	
			1.3.2b	10 59 N8 63 61 60 1N9 170 172	
			1.3.2c	10 52 53 61 60 1N9 170 172	
			1.3.2d	16 12 39 53 61 60 1N9 170 172	
		Productivity	1.3.3a	24 37 45 6 66	
		Structure	1.3.4	6 35 24 66	
2	1	Brand	2.1.1	N1 N6 52 60 170 172	N1 2 7 N3 19 20 21
		Customer orientation	2.1.2a	59 N8 61 60 170 172	
			2.1.2b	52 62 53 61 60 170 172	
			2.1.2c	52 62 53 63 160 60 1N9 170 172	
		Solution orientation	2.1.3	N2 37 61 1N9 167 168 2	
		Management	2.1.4	14 N3 12 18 20 167 168	
3	1	Marketing	3.1.1	18 53 N6 N1 160 170 172	18 19 20
		Customer value	3.1.2	8 37 53 61 63 160 1N9	
		Service	3.1.3	59 N8 63 60 160	
		Partner	3.1.4	16 167	
	2	Innovation	3.2.1a	2 61 60 170 172	N1 15 18 20 N4
			3.2.1b	18 7 N5 41 61 60 170 172	
		Trust	3.2.2a	41 52 53 61 60 170 172	
			3.2.2b	59 52 53 61 60 170 172	
			3.2.2c	N6 60 170 172	
		Quality	3.2.3a	45 41 53 N8 61 63 N9	
			3.2.3b	45 167	
		Service	3.2.4	12 53 N8 59 63 N9	
	3	Brand	3.3.1	N1 N6 63 60 167 170 172 1N9	N2 2 N3 18 19 20 21
		Product quality	3.3.2a	25 30 61 63 60 167 170 172 1N9	
			3.3.2b	25 30 167	
		Service	3.3.3	N8 63 60 167 170 172 1N9	
		User	3.3.4	41 59 39 53 61 63 60 167 170 172 1N9	
4	1	Cost increase	4.1.1	37 74	2 N3 20
		Cost decrease	4.1.2a	49 45 10 60 66 67	
			4.1.2b	N5 37 10 60 66 67	
			4.1.2c	46 10 60 66 67	
		Price and volume	4.1.3a	12 52 62 60 66 N9	
			4.1.3b	N5 53 61 N1 60 66 67 N9	
			4.1.3c	N6 61 N1 60 66 67 N9	
5	1	Customer Satisfaction	5.1.1	52 N8 53 41 61 60 1N9 170 172	2 10 14 18 19 30
		Scope	5.1.2a	22 12 61 60 170 172	
			5.1.2b	22 12 60 170 172	
		Marketing	5.1.3	10 24 N5 N7 N6 166	
		Cost	5.1.4a	37 66	
			5.1.4b	32 72 166	
			5.1.4c	24 166	
	2	Process	5.2.1	32 42 39 37 66 170 172	N2 7 13 16 18 19 20 21 25 N4 30 N5 37 39
		Engineering	5.2.2a	N5 48 37 66 170 172	
			5.2.2b	N5 48 37 161 160 66 170 172	
		Product Assembly	5.2.3	24 37 161 160 66 170 172	
			5.2.4	6 10 45 37 166	
		Customer proximity	5.2.5a	13 18 61 160 1N9	
			5.2.5b	6 47 24 52 61 160 1N9	
			5.2.5c	8 16 62 52 61 160 1N9	
			5.2.5d	52 61 160 1N9	
	3	Innovation	5.3.1a	24 42 41 61 60 N9	N2 18 20 25
			5.3.1b	24 42 53 61 60 N9	
		Quality	5.3.2a	20 30 42 37 N5 39 53 61 160 170 172	
			5.3.2b	20 30 42 37 166	
		Porfolio	5.3.3	63 160 170 172	
	4	Customer relationship	5.4.1a	18 N7 59 52 63 60 N9	13 20 25
			5.4.1b	52 53 41 63 60 N9	
			5.4.1c	12 47 63 61 60 N9	
		Benefit	5.4.2a	53 61 60 N9	
			5.4.2b	61 N8 60 N9	
		Technology	5.4.3a	12 37 39 68 61 60 N9	
			5.4.3b	12 37 39 68 166	
		Quality	5.4.4a	12 37 63 61 66	
			5.4.4b	6 45 61 66	

Relational ladder elements are low to medium correlated as shown in figure 52. Only 13 dependencies are above 0.5 ranging from 0.51 to 0.71 and thus, easing the restriction of not consolidating on firm-level.

	1.1	1.2	1.3	2.1	3.1	3.2	3.3	4.1	5.1	5.2	5.3	5.4
1.1	1											
1.2	0,33	1										
1.3	0,66	0,25	1									
2.1	0,68	0,19	0,67	1								
3.1	0,25	0,02	0,30	0,45	1							
3.2	0,66	0,12	0,64	0,71	0,43	1						
3.3	0,58	0,14	0,62	0,67	0,47	0,58	1					
4.1	0,25	0,29	0,27	0,19	- 0,00	0,23	0,04	1				
5.1	0,42	0,13	0,64	0,47	0,15	0,54	0,37	0,24	1			
5.2	0,32	- 0,01	0,40	0,28	0,37	0,17	0,16	0,09	0,28	1		
5.3	0,31	0,05	0,34	0,34	0,37	0,47	0,31	0,13	0,34	0,39	1	
5.4	0,44	0,17	0,40	0,28	0,21	0,51	0,23	0,47	0,28	0,11	0,40	1

FIGURE 52: LA CORRELATION ANALYSIS – INTERVIEWEE LEVEL

In addition, the minimum and maximum amount of elements related to each other in one single ladder range from 0 to 6 and the total amount of elements stated by a single interviewee varies from 24 to 70. Figure 53 provides further details on descriptive statistics.

	1.1	1.2	1.3	2.1	3.1	3.2	3.3	4.1	5.1	5.2	5.3	5.4
Mean	0,84	0,52	0,92	0,77	0,38	0,80	0,70	0,67	0,61	1,09	0,56	0,80
Standard Error	0,16	0,10	0,17	0,14	0,08	0,17	0,16	0,17	0,11	0,19	0,12	0,19
Mean	0	0	0	0	0	0	0	0	0	0	0	0
Standard Deviation	1,25	0,82	1,37	1,11	0,65	1,39	1,26	1,35	0,88	1,50	0,96	1,49
Minimum	0	0	0	0	0	0	0	0	0	0	0	0
Maximum	6	3	5	4	3	5	5	6	3	6	4	6
Sum	54	33	59	49	24	51	45	43	39	70	36	51
Count	64	64	64	64	64	64	64	64	64	64	64	64
Confidence Level(95,0%)	0,31	0,20	0,34	0,28	0,16	0,35	0,31	0,34	0,22	0,37	0,24	0,37

FIGURE 53: LA DESCRIPTIVE STATISTICS – INTERVIEWEE LEVEL

C.3.2. ANALYSING LADDERS

The analysis of relationships within ladders is based on the amount of ladder inclusions of elements. Thus, an elements relational importance is determined by the sum of ladders it is included. Additionally, the critical realist stance of the research construct requires separating the real generative mechanisms in activity drivers, activities, capabilities and resources. Figure 54 shows the corresponding weighting. Similar to LEA, LA applies a 2% cap resulting in 14 elements representing 62.2% of all elements mentioned. Present in 48.9% of all ladders, the majority of elements exceeding the 2% cap are conceptual elements and activity drivers, followed by activities with 11 % and one capability with 2.3%. No resource exceeds the 2% limit. Excluding non-explicit elements is altering the distribution to 35.2%, 28.6% and 9.6%, however, is not changing the order of relationship importance. One reason for

this clear dominance of activity drivers is the laddering approach itself. Ladders are created inductively from activities, capabilities and resources pointing to activity drivers. Thus, higher level ladder elements, such as activity drivers, are logically more often included in different ladders than lower level elements resulting in higher proportions of activity drivers than individual activity, capability or resource elements.

As, however, the research construct applied in this research is clearly differentiating entities in the real domain the impact on the subsequent analysis is limited as drivers, activities, and capabilities and resources are analysed separately. Nonetheless, for indicating the relative importance of elements assigned to each of these categories a percentage relative to total elements included in ladders is provided.

C.3.2.1. LA FOR UNDERLYING CONCEPT AND ACTIVITY DRIVERS

Activity drivers are distinguished in explicit and indirect for separating explicit interviewee mentioning (E) from indirect references inferred from other ladder elements. Thereby, it is possible to evaluate direct and indirect impact of conceptual elements and activity drivers. 54.3%, more than half of all model elements refer to four conceptual elements and activity drivers, In particular, 44 or 16.9% of the elements in this category direct to ‘increase volume’, 39 or 14.9% to ‘customer demands’, both underpinning the importance of differentiation induced volume effects. In addition, the two indirect ladder elements ‘economies of scope’ and ‘economies of scale’ depend on this volume effect and add another 23.8% further supporting its conceptual importance. Moreover, ‘total customer cost’ and ‘high prices’ cover 14.9% of all ladders and stress the focus on customer benefits. Thus, interviewees covering almost all firms confirm that despite having the highest prices they simultaneously achieve favourable total customer cost. As more than 80% of all elements in this category comprise relational elements of either differentiation induced volume effects or price and customer cost, HS firms seem to achieve high levels on each of these drivers simultaneously. Moreover, only direct HS specific ‘economies of modularity’ and ‘economies of quality’ are slightly exceeding the 2% cap (3.1% and 2.3%). However, considering both indirect and direct elements increases their relational importance to a total of 4.4% and 3.7% respectively. Consequently, these economies are central for explaining ladder relationships.

C.3.2.2. LA FOR ACTIVITIES

Included in 19 ladders or 4% of all ladders, ‘capture customer needs and focus on perceived value’ is the most important relational activity. Following second and third are ‘focus on architecture and processes’ and ‘establish close customer relationship’ in MS with 3.7% and 3.3% respectively. All remaining activities are represented in less than 2% of all ladders. Also important, despite each representing only 1.9% of all category elements are ‘decompose and reconstruct value chain’, ‘focus on manufacturing technology’ and ‘position and align brand with customer perceived value’. Including the next four activities ‘continually improve products and processes’, ‘apply customer information in RD’, ‘ensure or quickly restore product usability’ and ‘establish close customer relationship in service’ covers 76% of all activity ladder elements. In summary, two of the top three relational activities are related to ‘customer centricity’, while the third is related to ‘fulfilment of customer needs’. Considering the remaining activities within the top ten further strengthens this conclusion as four are focused on the customer and three on fulfilment.

FIGURE 54: OVERVIEW ON LA

Underlying concept and activity drivers						
Cat	Name	Explicit	ID	Amount	%Cat	%Total
VOL	Increase volume	E	60	44	16,9	9,1
VOL	Customer demands	E	61	39	14,9	8,1
SCOPE	E.o. scope	N	170	31	11,9	6,4
SCALE	E.o. scale	N	172	31	11,9	6,4
PRI	High prices	N	1N9	22	8,4	4,6
VOL	Total customer cost	E	63	17	6,5	3,5
PRI	High prices	E	N9	13	5,0	2,7
DCOST	E.o. modularity	E	66	15	5,7	3,1
VOL	Increase volume	N	160	12	4,6	2,5
DCOST	E.o. quality	N	167	11	4,2	2,3
DCOST	E.o. quality	E	67	7	2,7	1,5
DCOST	E.o. modularity	N	166	6	2,3	1,2
VOL	Cusotmer involvement	E	62	5	1,9	1,0
VOL	Customer demands	N	161	2	0,8	0,4
DCOST	E.o. speed	E	68	2	0,8	0,4
DCOST	E.o. speed	N	168	2	0,8	0,4
SCALE	E.o. scale	E	72	1	0,4	0,2
IDCOST	Complexity	E	74	1	0,4	0,2
VOL	Customer involvement	N	162	-	-	-
VOL	Total customer cost	N	163	-	-	-
DCOST	E.o. substitution	E	65	-	-	-
SCOPE	E.o. scope	E	70	-	-	-
IDCOST	Labor cost	E	73	-	-	-
IDCOST	Risk	E	75	-	-	-
IDCOST	Capital cost	E	76	-	-	-
				261	100	54,3

Activities					
Cat	Name	ID	Amount	%Cat	%Total
MS	Capture customer needs, focus on perceived value	53	19	13,0	4,0
RD	Focus on architecture and processes	37	18	12,3	3,7
MS	Establish close customer relationship	52	16	11,0	3,3
INF	Decompose and reconstruct value chain	24	9	6,2	1,9
OPS	Focus on manufacturing technology	45	9	6,2	1,9
MS	Position, align brand with customer perceived value	N6	9	6,2	1,9
RD	Continually improve products and processes	39	8	5,5	1,7
RD	Apply customer information in RD	41	8	5,5	1,7
SER	Ensure or quickly restore product usability	N8	8	5,5	1,7
SER	Establish close customer relationship	59	7	4,8	1,5
HR	Involve and empower employees	30	5	3,4	1,0
RD	Apply preventive measures	42	5	3,4	1,0
TEC	Apply sophisticated manufacturing technology	32	4	2,7	0,8
MS	Focus on enabling customers in applying products	N7	4	2,7	0,8
INF	Collaborate in self-managed teams, flat hierarchies	25	3	2,1	0,6
OPS	Continuously improve operations	46	3	2,1	0,6
OPS	Integrate development, marketing, operations	48	3	2,1	0,6
HR	Educate and motivate employees	29	2	1,4	0,4
OPS	Apply customer information in manufacturing	47	2	1,4	0,4
PUR	Apply selective outsourcing of standard components	35	1	0,7	0,2
RD	Early involve manufacturing	40	1	0,7	0,2
OPS	Invest long-term in manufacturing and ICT	49	1	0,7	0,2
MS	Apply ICT to collect, analyse customer information	54	1	0,7	0,2
INF	Network with external partners	26	-	-	-
HR	Attract talents and develop employer reputation	N4	-	-	-
HR	Share and reuse knowledge	28	-	-	
TEC	Apply ICT for coordinating systen and value chain	33	-	-	
RD	Concurrently plan, develop and engineer	38	-	-	
MS	Continually analyse knowledge on customers	55	-	-	
MS	Research competitor and market information	56	-	-	
MS	Research with focus on customer needs	57	-	-	
			146	100	30,4

Resources and capabilities					
Cat	Name	ID	Amount	%Cat	%Total
MC	Identify, evaluate, capture opportunities	12	11	14,9	2,3
OC	Flexible, integrated manufacturing	6	8	10,8	1,7
OR	Strong brand	N1	8	10,8	1,7
OC	Innovate and generate customer value	N5	8	10,8	1,7
MC	Manage system based	10	7	9,5	1,5
CC	Employee commitment on HS concept	18	5	6,8	1,0
OR	Motivated, qualified employees	N2	3	4,1	0,6
OC	Organisational and individual learning	7	3	4,1	0,6
OC	Sense and respond to customer preferences	8	3	4,1	0,6
MC	Educate and sustain employees	13	3	4,1	0,6
MC	Provide objectives and incentives	14	3	4,1	0,6
MC	Integrate external partners	16	3	4,1	0,6
CC	Collaboration and knowledge exchange	20	3	4,1	0,6
OR	Sufficient and long-term investment	2	2	2,7	0,4
CC	Focusing on mass markets	22	2	2,7	0,4
MC	Pragmatically execute	N3	1	1,4	0,2
MC	Build long lasting customer relationships	15	1	1,4	0,2
OC	Implement and operate ICT	4	-	-	-
OC	Process and analyse information	5	-	-	-
MC	Manage, combine, integrate knowledge	11	-	-	-
CC	Customer orientation and change affinity	19	-	-	-
CC	Long-term orientation	21	-	-	-
Sum			74	100	15,4

C.3.2.3. LA FOR RESOURCES AND CAPABILITIES

With 15.4% of all ladders, resources and capabilities represent the smallest proportion of all elements included in ladders. This is caused by the fact, that interviewees assigned substantial parts of this category cross-ladder, which in turn reduces the amount of resources and capabilities from a total of 135 to only 74 included in ladders. Consequently, their relative weight decreases. Nonetheless, 'identify, evaluate and capture market opportunities' is exceeding the 2% cap and thus, considered a key relational capability. Including the next four elements increases the coverage in this category to a substantial 57%. Three of these four are capabilities: the capability 'to operate flexible, computer integrated manufacturing', 'to innovate and generate customer perceived value' as well as 'to manage system based' representing 1.7%, 1.7% and 1.5% respectively. The only resource in the top five of this category is 'strong brand' included in 1.7% of all ladders. Thus, two capabilities and one resource are directed to achieve 'customer centricity', while two capabilities are focused on the efficient design of the 'fulfilment process'. Figure 55 provides a summary on the ten most important relational ladder elements in total and the top five within each of the categories.

10 Most Related Ladder Elements	Building Block	Total	% Total
Underlying Concept and Activity Drivers		**184**	**38,3%**
Increase volume through customer satisfaction	Customer centricity	44	9,1%
Customer demands	Customer centricity	39	8,1%
Economies of scope	Resulting from customer centricity	31	6,4%
Economies of scale	Resulting from customer centricity	31	6,4%
High prices	Customer centricity	22	4,6%
Economies of modularity	Customer centricity; fullfilment of customer needs	17	3,5%
Activities		**53**	**11,0%**
Capture customer needs and focus on perceived customer value	Customer centricity	19	4,0%
Focus on architecture and processes	Fulfilment of customer needs	18	3,7%
Establish close customer relationship in marketing and sales	Customer centricity	16	3,3%
Resources and Capabilities		**11**	**2,3%**
Identify, evaluate and capture market opportunities	Customer centricity	11	2,3%
Total		248	**51,6%**

Individual element contribution

5 Most Related Ladder Elements Per Category	Building Block	Total	% Total
Underlying Concept and Activity Drivers		**145**	**30,1%**
Increase volume through customer satisfaction	Customer centricity	44	9,1%
Customer demands	Customer centricity	39	8,1%
Economies of scope	Resulting effect from customer centricity	31	6,4%
Economies of scale	Resulting effect from customer centricity	31	6,4%
Activities		**71**	**14,8%**
Capture customer needs and focus on perceived customer value	Customer centricity	19	4,0%
Focus on architecture and processes	Fulfilment of customer needs	18	3,7%
Establish close customer relationship in marketing and sales	Customer centricity	16	3,3%
Decompose and reconstruct value chain	Fulfilment of customer needs	9	1,9%
Focus on manufacturing technology	Fulfilment of customer needs	9	1,9%
Resources and Capabilities		**42**	**8,7%**
Identify, evaluate and capture market opportunities	Customer centricity	11	2,3%
Flexible, integrated manufacturing	Fulfilment of customer needs	8	1,7%
Strong brand	Customer centricity	8	1,7%
Innovate and generate customer value	Customer centricity	8	1,7%
Manage system based	Fulfilment of customer needs	7	1,5%
Total		258	**53,6%**

Figure 55: Overview on most important relational ladder elements

VI. DISCUSSION

A. DISCUSSION ON RESEARCH QUESTIONS

As this research intends to analyse the underlying mechanisms of HS, this chapter answers the research questions by applying data from LEA and LA. Furthermore, the results are applied to substantiate the research construct in order to evaluate the hypothesized mechanisms.

A.1. Do HS firms apply consistent strategy concepts?

A.2. Do HS firms consistently implement on capability and resource level?

A.3. What activities do HS firms apply for achieving external fit with its market demands?

A.4. What activities do HS firms apply internally for fulfilling these market demands?

A.5. What resources and capabilities are required for achieving A.3 and A.4?

The first two questions focus mainly on the composition of strategy elements in terms of intention and consistency of the HS concept and implementation. Consequently, LEA data is most appropriate for analysing 'constellations' of elements. In particular, the first question focuses on the conceptual aspects of HS shown in the category of underlying concepts and activity drivers, while the second question addresses the categories of activities, capabilities and resources.

In contrast, questions three, four and five focus on relational elements of either activities applied for achieving internal or external fit, or capabilities and resources underlying these activities. Thus, the analysis centres on LA data allowing determining relationships within ladders. For an overview on LEA or LA see figures 49 and 51.

A.1. CONSISTENT STRATEGY CONCEPT

Question 1 requires a focus on elements of the underlying concept and activity drivers for answering if HS firms apply consistent strategy concepts intentionally (Mintzberg, 1978). Correspondingly, the consistency of the underlying concept is analysed before the consistency of activity drivers is examined. For both analysis is performed on firm specific and cross-firm level.

Interviewees provide a first indication for answering this question by either not knowing or not explicating the term hybrid or one of its derivates such as combination, utility or mixed strategy. Similarly, no interviewee mentioned the underlying concepts of substitution, integration, quality or speed economies. LEA data underpin this fact by showing – besides exceptions representing only a minor 1.2% – no direct mentioning of HS specific economies. Including indirect indications, however, leads to a significant recognition of concept specific economies of quality (10.7%), variety (5%) and speed (0.3%). Analysing consistency on firm level shows combinations of at least two of the three concept specific economies. In particular, while firm three clearly focuses on quality, firm one and two emphasize quality and innovation, firm four comprises variety, quality and innovation and firm five centres on variety and quality. Thus, quality is included in each of the firm's strategy concept and seems to be a central conceptual pillar. Additionally, most of the concept independent economies of scope and scale appear, besides one exception, in combination. In total, it can be concluded that HS firms follow a consistent, however, not as theoretically predicted pure, but combined strategy concept.

Moreover, these combined strategy concepts are directed to two main activity drivers: customer satisfaction and volume as well as price and total cost. At the heart of the applied strategy concepts is 'meeting customer demands', 'creating customer satisfaction' and with only a small contribution 'customer involvement' representing together 15.1% of all LE. Similar to concept combinations, all three occur in combination, however, with different emphasis. In particular, firms one, two and three focus predominantly on meeting customer demands, while the remaining two firms focus either on the more general aspect of customer satisfaction or on both. Thus, as expected HS firms focus on 'customer centricity' as a key underlying conceptual strategy element. This supports HS theories, arguing a strong focus on customer benefits or customer utility (Chrisman, Hofer, & Boulton, 1988; DeCastro & Chrisman, 1995). In this theoretical line of reasoning, customer utility results from lower prices and higher quality, variety, innovation or speed. The results of this research, however, contradict these findings as the competitive weapon of low cost are not necessarily applied for reducing sales prices. Rather it is found that HS firms apply a combination of competitive weapons of *higher prices but lower total cost* for the customer (Chrisman, Hofer, & Boulton, 1988). This is found in each of the cases, but extremely for firm four concentrating primarily on higher prices. Thus, firm four masters the hybrid challenge of achieving higher volumes despite higher prices through its market leading position. In all

other firms, higher volume is generated through achieving lower *total cost* for customers over the product's lifecycle despite prices on or above competitive level. This explains the strong direct and indirect support of higher prices (2.7%) next to lower total customer cost (3.3%) However, these results require further research elaborating on distinguishing cost related competitive weapons of HS.

In summary, above findings suggest that HS firms apply intentionally and consistent, but mixed strategy concepts based on generating high customer utility through aligning two competitive weapons of differentiation and price or total customer cost.

A.2. CONSISTENT IMPLEMENTATION

Question two addresses the firms' consistency of implementing activities, capabilities and resources required to analyse the importance of elements and thus, demanding LEA data. Both, structural analysis and LEA identified three common implementation pillars of HS: 'customer centricity', ‚fulfilment of customer requirements' and 'employee orientation'. Correspondingly, the consistency of implementing each of these building blocks is analysed, analogously to the strategy concept, first across and then within each of the firms. In the following, each building block is discussed separately. Figure 56 provides an overview on LE assigned to the different strategic building blocks.

A.2.1. CUSTOMER CENTRICITY

Activities, capabilities and resources focusing on 'customer centricity' account for 24.1% of all LE. In particular, this building block rests on MS activities (11.2%), cultural characteristics (4.2%), service activities (2.8%), operational resources (2.0%), management (2.0%) and operational (1.9%) capabilities. Mainly 'customer facing' areas are involved in generating customer centricity, while each of the categories of capabilities and resources is required. The included MS activities 'establish close customer relationship', 'capture customer needs and focus on customer perceived value', 'strongly position and align brand with customer perceived value' and 'focus on enabling customers' indicate the importance of these activities for achieving customer centricity. This corresponds to the service activities 'apply service to ensure or quickly restore product usability' and 'establish close customer relationship' enhancing the scope of customer centricity to post-sales activities.

A second fundamental building block of customer centricity is the firm's culture and in particular, a culture fostering 'employee commitment to HS concept and customer satisfaction', 'long-term orienta-

tion' and 'customer orientation and change affinity'. As cultural characteristics are typically not restricted to a single function or business unit but comprise the whole organisation, this indicates a general firm orientation on customer centricity. Moreover, it needs to be mentioned that two of the three cultural elements are focusing on both 'customer centricity' and 'employee orientation' suggesting that both concepts are intertwined from an implementation point of view.

However, for consistently applying activities matching resources and capabilities are required. In case of 'customer centricity' this is the operational resource 'brand', the management capability of 'identifying, evaluating and capturing future market opportunities' and the operational capabilities of 'innovating and generating customer perceived value' and 'sensing and responding to customer needs'.

Further detailing the analysis on firm-level discloses that all firms, besides firm four, implemented 10 to 12 of the total 13 elements assigned to 'customer centricity' simultaneously, suggesting mutual dependencies or even self-reinforcement.

Thus, 'customer centricity' is indicating consistency in several instances. First, across firms a high degree of commonality exists. Second, a multitude of internal activities, capabilities and resources is involved in realizing this orientation suggesting not only a limited phenomenon. Third, most of the involved activities, capabilities and resources are implemented on firm level simultaneously.

FIGURE 56: OVERVIEW ON ELEMENTS ASSIGNED TO STRATEGIC BUILDING BLOCKS

Category	Elements	Building block	Total	F1	F2	F3	F4	F5	% Sub-Total
MS	52. Establish close customer relationship	CC	10,7	2,7	2,0	2,0	2,0	2,0	4,2%
MS	53. Capture customer needs and focus on customer perceived value	CC	9,0	2,0	1,0	3,3	1,0	1,7	3,6%
MS	N6. Strongly position and align brand with customer perceived value	CC	7,0	1,7	1,0	1,7	2,0	0,7	2,8%
MS	N7. Focus on enabling customers	CC	1,7	1,0	-	-	-	0,7	0,7%
CUL	18. Culture fostering employee commitment to HS concept and customer satisfaction	CC, EMP	5,0	0,3	1,0	2,0	-	1,7	2,0%
CUL	21. Culture fostering long-term orientation	CC, EMP	3,0	1,0	1,0	0,7	-	0,3	1,2%
CUL	19. Culture fostering customer orientation and change affinity	CC	2,7	-	1,0	0,7	-	1,0	1,1%
SER	N8. Apply service to ensure or quickly restore product usability	CC	3,7	0,3	1,0	1,7	-	0,7	1,5%
SER	59. Establish close customer relationship	CC	3,3	0,3	1,0	1,7	-	0,3	1,3%
OR	N1. Brand	CC	5,0	1,0	2,0	1,0	1,0	-	2,0%
MC	12. Capability to identify, evaluate and capture future market opportunities	CC	5,0	1,0	1,0	0,7	1,0	1,3	2,0%
OC	N5. Capability to innovate and generate customer perceived value	CC	3,7	0,7	-	0,3	1,0	1,7	1,5%
OC	8. Capability to sense and respond to customer needs	CC	1,0	0,3	-	0,3	-	0,3	0,4%
Total customer centricity									**24,1%**
RD	37. Focus on architecture and processes, not products	FF	9,0	1,0	1,0	0,3	3,0	3,7	3,6%
RD	39. Continually improve products and processes	FF	3,3	1,0	-	0,3	-	2,0	1,3%
RD	41. Apply customer information in R&D	FF	3,0	0,3	-	1,7	-	1,0	1,2%
MC	N3. Capability to pragmatically execute	FF	6,7	0,3	4,0	0,3	2,0	-	2,6%
MC	10. Capability to manage system based	FF	2,7	0,3	-	-	1,0	1,3	1,1%
OC	6. Operate stable, but flexible computer integrated manufacturing	FF	5,0	3,0	-	-	1,0	1,0	2,0%
OC	7. Organizational and individual learning and align internal operations accordingly	FF	3,0	1,0	1,0	0,3	-	0,7	1,2%
OPS	45. Focus on manufacturing technology	FF	3,3	1,3	-	0,3	1,0	0,7	1,3%
OPS	46. Continuously improve operations	FF	2,3	1,0	-	-	1,0	0,3	0,9%
OPS	47. Apply customer information in manufacturing	FF	1,0	-	-	-	-	1,0	0,4%
OR	2. Sufficient and long-term investments	FF	4,0	1,0	1,0	0,7	1,0	0,3	1,6%
OR	48. Integrate product development and marketing with production planning and operations	FF	1,7	0,7	-	-	-	1,0	0,7%
FI	24. Decompose and reconstruct value chain according to customer specific and customer neutral activities	FF	3,0	1,3	-	-	-	1,7	1,2%
TECH	32. Apply sophisticated manufacturing technologies	FF	2,3	1,3	-	-	-	1,0	0,9%
Fulfilment of customer needs									**20,0%**
CUL	20. Culture fostering collaboration and knowledge exchange	EMP	9,7	2,7	3,0	1,3	1,0	1,7	3,8%
MC	14. Provide clear orientation through objectives and incentives	EMP	4,7	2,3	2,0	-	-	0,3	1,9%
MC	13. Capability to educate and sustain employees	EMP	3,7	2,3	-	-	-	1,3	1,5%
HR	30. Involve and empower employees	EMP	2,0	0,3	-	0,3	-	1,3	0,8%
HR	N4. Attract employees and develop employer brand	EMP	1,0	0,3	-	0,3	-	0,3	0,4%
HR	29. Educate and motivate employees	EMP	1,0	1,0	-	-	-	-	0,4%
OR	N2. Motivated and highly qualified employees	EMP	2,3	0,3	1,0	0,3	-	0,7	0,9%
FI	25. Collaborate in self-managed cross-functional teams and flat hierarchies	EMP	2,0	0,7	-	0,3	-	1,0	0,8%
Employee orientation									**10,4%**
Total			**137,3**	**36,0**	**25,0**	**22,7**	**19,0**	**34,7**	**54,5%**

A.2.2. Fulfilment of customer needs

The 14 elements allocated to ‘fulfilment of customer needs’ involve activities from RD, operations, firm infrastructure and technology, operational and management capabilities as well as operational resources altogether representing 20% of total elements. In particular, RD represents 6.1% of all elements in LEA and is the key category in fulfilment, with its core on ‘focus on architecture and processes’. Besides that, RD is required to incorporate and elaborate on information gathered by the concept of ‘customer centricity’ used for ‘continually improving products and processes’ or ‘applying customer information in RD’. This supports the quality orientation of the combinative strategy concepts identified previously.

The second most important ‘fulfilment’ category is capabilities representing in total 6.9%, which are almost equally distributed on management and operational capabilities. Management capabilities represent 3.7% of all elements involving the capabilities to ‘pragmatically execute’ and ‘to manage system based’. The last capability is interdependent to the activity of ‘focusing on architecture’ requiring system based, architectural capabilities. Additionally, this fits to the firm infrastructure activity of ‘decomposing and reconstructing the value chain in accordance to customer needs’. Operational capabilities represent 3.2% of total elements and focus, contrary to management capabilities, primarily on operations. Both operational capabilities ‘operate stable, but flexible manufacturing’ and ‘learn and align operations accordingly’ fit well with operations activities of ‘focusing on manufacturing technology’, ‘continuously improving operations’, ‘applying customer information in manufacturing’ and ‘integrating product development and marketing with production planning and operations’. Furthermore, ‘fulfilment’ is supported by the resource ‘sufficient and long-term investments’ allowing devoting substantial funds to flexible and automated manufacturing systems on a long-term basis. This is also in line with the remaining technology activity of ‘applying sophisticated manufacturing technologies’.

Contrary to results on ‘customer centricity’, firm-level ‘fulfilment’ is more heterogeneous with only two elements ‘focus on architecture and processes’ and ‘sufficient and long-term investments’ applied in all participating firms. Of the remainder, three firms share ‘capability to pragmatically execute’, ‘organizational and individual learning and align internal operations accordingly’ and ‘focus on manufacturing technology’. The rest of the firms have only two or three activities, capabilities and resources

in common. Consequently, five of the 14 elements in this category are consistently implemented across firms.

In summary, also for the strategic building block of ‘fulfilment of customer needs’ consistent implementations are identified but to a lower degree compared to customer consistency as more heterogeneous activities, capabilities and resources are applied.

A.2.3. Employee orientation

The eight elements assigned to employee orientation represent 10.4% and if including the before mentioned shared elements with customer orientation even account for 13.6% of all elements. Categories required to implement this orientation are operational resources, company culture, management capabilities as well as activities in HR and firm infrastructure. The predominant element of employee orientation is ‘culture fostering collaboration and knowledge exchange’ representing with 3.8% the second most mentioned element of all activities, capabilities and resources. Adding second and third ranked management capabilities of ‘provide clear orientation through objectives and incentives’ and ‘educate and sustain employees’ is covering 68% of all employee oriented elements. The remainder of elements are activities in HR of ‘involving and empowering employees’, ‘attracting employees and developing employer brand’ and ‘educating and motivating employees’, firm infrastructure of ‘collaboration in self-managed cross-functional teams and flat hierarchies and the resource of ‘motivated and qualified employees’. However, this indicates one of the shortcomings of this research approach of identifying elements operating in mechanisms but not determining their direction or their sequence within these mechanisms. For instance, the ‘employee orientation’ mechanism could work its way from the operational resource of ‘motivated and qualified employees’ to ‘employee involvement or empowerment’ as self-confident employees demand more responsibilities. However, it could also operate the opposite way from employee oriented HR practices driving employee motivation and qualification.

On firm level, elements are combined heterogeneously besides for ‘collaborative and knowledge changing culture’ and ‘motivated and qualified employees’ implemented in all or four of the firms respectively. In addition, the four elements ‘provide clear orientation through objectives and incentives’, ‘involve and empower employees’, ‘attract employees and develop employer brand’, and ‘collaborate in self-managed cross-functional teams and flat hierarchies’ are shared by three firms. The

remaining capability ‘educate and sustain employees’ and activity ‘educating and motivating employees’ are present in two or only one firm respectively. Thus, the two major components of consistently implementing employee orientation on firm level are ‘collaborative company culture’ and the resource of ‘motivated and qualified employees’.

In summary, also for ‘employee orientation’ consistent implementations are identified across firms comprising activities, capabilities and resources. However, consistent firm level implementations are identified for only a small subset of two elements.

Nonetheless, empirical results from LEA suggest consistent implementations for all of the three strategic building blocks of HS. In contrast to questions two and three, the following questions focus on relational elements requiring LA to identify key relational elements.

A.3. Activities for achieving fit with market demands

Fit within a firm’s activity system is an important factor in achieving competitive advantage and occurs in three different forms: consistency, mutual reinforcement, and comprehensive system optimization (Mintzberg, Lample, Quinn, & Goshal, 2003). Thus, a consistent, mutually reinforced and comprehensively optimized internal activity system creates internal fit. Contrary to this, external fit is established through firm activities matching external activity drivers. The result of achieving internal and external fit is competitive advantage (Mintzberg, Lample, Quinn, & Goshal, 2003). Figure 57 provides an overview on activities assigned to both fit types. In total, this analysis founds on 23 elements mentioned 146 times in ladders.

Activities

Cat	Name	Alignment on fit	Amount	%	% Tot
MS	Capture customer needs, focus on perceived value	E	19	13,0%	4,0%
MS	Establish close customer relationship	E	16	11,0%	3,3%
MS	Position, align brand with customer perceived value	E	9	6,2%	1,9%
SER	Ensure or quickly restore product usability	E	8	5,5%	1,7%
SER	Establish close customer relationship	E	7	4,8%	1,5%
MS	Focus on enabling customers in applying products	E	4	2,7%	0,8%
MS	Apply ICT to collect, analyse customer information	E	1	0,7%	0,2%
INF	Network with external partners	E	0	0,0%	0,0%
HR	Attract talents and develop employer reputation	E	0	0,0%	0,0%
MS	Research competitor and market information	E	0	0,0%	0,0%
MS	Research with focus on customer needs	E	0	0,0%	0,0%
TEC	Apply ICT for coordinating system and value chain	E/I	0	0,0%	0,0%
RD	Focus on architecture and processes	I	18	12,3%	3,8%
OPS	Focus on manufacturing technology	I	9	6,2%	1,9%
INF	Decompose and reconstruct value chain	I	9	6,2%	1,9%
RD	Apply customer information in RD	I	8	5,5%	1,7%
RD	Continually improve products and processes	I	8	5,5%	1,7%
RD	Apply preventive measures	I	5	3,4%	1,0%
HR	Involve and empower employees	I	5	3,4%	1,0%
TEC	Apply sophisticated manufacturing technology	I	4	2,7%	0,8%
OPS	Continuously improve operations	I	3	2,1%	0,6%
OPS	Integrate devleopment, marketing and operations	I	3	2,1%	0,6%
INF	Collaborate in self-managed teams, flat hierarchies	I	3	2,1%	0,6%
HR	Educate and motivate employees	I	2	1,4%	0,4%
OPS	Apply customer information in manufacturing	I	2	1,4%	0,4%
PUR	Apply selective outsourcing of standard components	I	1	0,7%	0,2%
RD	Early involve manufacturing	I	1	0,7%	0,2%
OPS	Invest long-term in manufacturing and ICT	I	1	0,7%	0,2%
HR	Share and reuse knowledge	I	0	0,0%	0,0%
RD	Concurrently plan, develop and engineer	I	0	0,0%	0,0%
			146		

I=Internal; E=External

FIGURE 57: OVERVIEW ON ACTIVITY IMPACT ON INTERNAL AND EXTERNAL ALIGNMENT

Despite internal oriented activities exceeding external activities in absolute terms (16 vs. 7), the relative share is more equally distributed (17.1% vs. 13.4%) suggesting that firms are combining both internal and external orientation for providing high customer value.

Relational activities achieving *external fit* are either located in MS (10.2% of total LA elements) or service (3.1%). Thus, HS firms seem to channel their external, customer-oriented activities through either of these functions. Of particular relational importance are two MS activities, ‘capturing customer needs and focusing on perceived customer value’ as well as ‘establishing close customer relationship’. The remaining activities are directed to two general customer focused themes: continuous customer relationship and customer enablement. While the first is achieved through service related activities establishing close customer relationship, branding for customer perceived value and collecting and analysing customer information, the second is realized through increasing product and service benefits through customer advisory, products ensuring or service quickly restoring product usability.

Evaluating external fit requires matching external oriented activities with the industry's key activity drivers. Activity drivers can be used to manipulate the value chain either in terms of cost and differentiation or in order to improve fit within a firm's activity system (Ghemawat, 2006; Sheehan & Foss, 2007). The two identified main drivers of HS are 'customer utility' and 'total customer cost'. Accordingly, two of the above explicated activities 'ensure or quickly restore product usability', and 'focus on enabling customers in applying products' are directed to total customer cost. The remainder activities are oriented towards customer utility through quickly identifying customer requirements by means of customer relationship or capturing customer needs. Thus, externally oriented marketing and service activities match with the two identified key activity drivers of HS suggesting external fit.

A.4. Activities for fulfilling customer needs

Relational activities focusing on *internal alignment* anchor in RD, operations, firm infrastructure, HRM, technology and procurement. By far the strongest relational category is RD representing 8.4% of all LA elements. The relevant activities in RD are 'focus on architecture and processes', 'apply customer information in RD', 'early involve manufacturing', 'continually improve products and processes' and 'apply preventive measures' with 3.8%, 1.7%, 1.7%, 1.0% and 0.2% of total elements respectively. Accounting for 3.8% of total elements, operations consisting of five internally focused activities rank second. In particular, operations activities are 'focusing on manufacturing technology' (1.9%), 'continuously improving operations' and 'integrating development, marketing and operations' (each 0.6%), 'applying customer information in manufacturing' (0.4%) and 'invest long-term in manufacturing and ICT' (0.2%). Of the remaining internally oriented activities, only one element in firm infrastructure 'decomposing and reconstructing value chain' (1.9%) and one in HR 'involving and empowering employees' (1.0%) exceed the 1% threshold. In total, for achieving internal fit HS firms rely on core activities in RD (8.4%), operations (3.8%), firm infrastructure (total of 2.5%) and HR (1.7%).

In a next step, internal fit is evaluated by testing the criteria of consistency, mutual reinforcement, and comprehensive system optimization (Mintzberg, Lample, Quinn, & Goshal, 2003). Internal activities are focusing on all categories but MS and service, thus suggesting consistency. One way for evaluating the existence of mutually reinforcing activities is to identify central themes involving similar activities. One such theme centres on *modularity* including process and product architecture, decompose and reconstruct value chain as well as flexible and sophisticated manufacturing technology. An-

other central theme is *quality* including preventive measures, applying customer information in RD and manufacturing, continually improve products and processes as well as operations, integrate development, marketing and operations, and early involve manufacturing. A last theme is *employee orientation* represented by 'involving and empowering employees', 'educating and motivating employees', 'collaborating in self-managed teams and flat hierarchies' and 'applying selective outsourcing of standard components'. These self-reinforcing themes, however, are dependent on each other indicated by the above described mixed strategy concepts of combinations with quality as a common basis. Moreover, as all relational activities besides 'investing long-term in manufacturing and ICT' are focused on these three themes a general system optimization can be implied. Thus, HS firms focus on separate activities for achieving external and internal fit indicated by no overlaps of relevant activities.

In summary, HS firms are not focusing purely on external *or* internal alignment but rather combinations of both. Thus as expected by theory, HS firms balance different classes or better systems of activities as for example Miles and Snow's analyser combines both external flexibility and internal stability (Miles & Snow, 1986). Similarly, it is in line with ABV stating that activity systems are sets of interdependent activities within and across a firm's boundaries, which can even overlap (Zott & Amit, 2010; Blackler, 2000). Consequently, firms included in this research dedicate external activities to two specific activity drivers and internal activities to three different activity systems.

A.5. Required stock of capabilities and resources

In ABV, competitive advantage results from 'mechanisms through which resources and capabilities get exposed to market processes where their ultimate value and ability to generate competitive advantage are realized' (Ray, Barney, & Muhanna, 2004, p. 35). Thus, only those resources and capabilities exposed to market processes are the ones *related* to external or internal activities. Consequently, the analysis of the required stock of capabilities and resources focuses on LA data.

Elements in this category are almost equally distributed to internal or external orientation (8.1% vs. 7.3% of all LA elements). Figure 58 provides an overview.

Resources and capabilities

Cat	Name	Orientation	Amount	%	% Total
OC	Flexible, integrated manufacturing	I	9	12,2%	1,9%
MC	Manage system based	I	7	9,5%	1,5%
CC	Employee commitment on HS concept	I	5	6,8%	1,0%
OR	Motivated, qualified employees	I	3	4,1%	0,6%
OC	Organisational and individual learning	I	3	4,1%	0,6%
MC	Educate and sustain employees	I	3	4,1%	0,6%
MC	Provide objectives and incentives	I	3	4,1%	0,6%
CC	Collaboration and knowledge exchange	I	3	4,1%	0,6%
OR	Sufficient and long-term investment	I	2	2,7%	0,4%
MC	Pragmatically execute	I	1	1,4%	0,2%
OC	Implement and operate ICT	I	0	0,0%	0,0%
OC	Process and analyse information	I	0	0,0%	0,0%
MC	Manage, combine, integrate knowledge	I	0	0,0%	0,0%
CC	Long-term orientation	I	0	0,0%	0,0%
MC	Identify, evaluate, capture opportunities	E	11	14,9%	2,3%
OR	Strong brand	E	8	10,8%	1,7%
OC	Innovate and generate customer value	E	7	9,5%	1,5%
OC	Sense and respond to customer preferences	E	3	4,1%	0,6%
MC	Integrate external partners	E	3	4,1%	0,6%
CC	Focusing on mass markets	E	2	2,7%	0,4%
MC	Build long lasting customer relationships	E	1	1,4%	0,2%
CC	Customer orientation and change affinity	E	0	0,0%	0,0%
			74		**15,4%**

E=External orientation; I=Internal Orientation

FIGURE 58: OVERVIEW RELATIONAL STOCK OF CAPABILITIES AND RESOURCES

In terms of categories, management capabilities contribute mostly to internal orientation (2.9% of total elements), followed by operational capabilities (2.5%), company culture (1.7%) and operational resources (1.0%). Relational management capabilities consist mainly of three elements ‘manage system based’, ‘educate and sustain employees’ and ‘provide objectives and incentives’ accounting for 1.5%, 0.6% and 0.6% respectively. Moreover, two operational capabilities ‘operate flexible, computer integrated manufacturing’ (1.9%) and ‘organisational and individual learning’ (0.6%), two cultural elements ‘employee commitment on HS concept’ (1.0%) and ‘collaboration and knowledge exchange’ (0.6%), and two operational resources ‘motivated, qualified employees’ as well as ‘sufficient and long-term investment’ are internally focused. However, only three of the internally oriented resources and capabilities exceed 1% of total elements.

Analogously, only the three following externally related elements surpass 1% of total elements, ‘identify, evaluate and capture opportunities’, ‘strong brand’ and ‘innovate and generate customer value’. The ranking of categories is similar to activities with management and operational capabilities

ranking first and second with 3.1% and 2.1% respectively, but operational resources (1.7%) and company culture (0.4%) changing ranks. The most considerable external related management capabilities are ‘identify, evaluate and capture opportunities’ (2.3%) and ‘integrate external partners’ (0.6%). Furthermore, operational capabilities important for external activities are ‘innovate and generate customer value’ (1.5%) and ‘sense and respond to customer preferences’ (0.6%). Contrary to internal orientation, however, one operational resource ‘strong brand’ is elaborated by external activities (1.7%).

In summary, with two-thirds of all capabilities and resources the major category is capabilities supporting previous theoretical and empirical research. However, while previous research neglected the importance of resources, this research finds the externally important resource ‘strong brand’. Moreover, company culture is assigned across ladders suggesting that company culture is primarily directed to the firm in general. Thus, HS firms consider company culture as an internal framework for activities deploying capabilities and resources within and across the firm’s boundaries rather than a relational element.

B. Discussion on research construct

As a final step in the results discussion, the research construct is substantiated by determining the most important, constituting elements based on LEA, before delineating the critical relational elements based on LA. While the first replies to research questions one and two, the second relies on answers to three, four and five. Either of the following criteria and corresponding limits determines the significance of elements: ranking among the top three elements in the respective category or exceeding 2.0% of total elements included in LEA or LA respectively.

If elements are relevant for achieving both fit and constitution of HS, the specific nature is assumed to outweigh the general character of the element and is assigned to fit. Due to this approach, all activities above the 2.0% limit or ranking among top 3 in each category are either assigned to external or internal fit despite their parallel importance as constitutional elements. In turn, this emphasizes the significance of these activities from both a constitutional and relational perspective and is in line with ABV suggesting capabilities and resources are engaged in market transactions for realizing their value (Sheehan & Foss, 2007). However, this is different for capabilities and resources showing distinct constitutional characteristics. Figure 59 illustrates the allocation of elements to the research construct.

Thus, constitutional and relational elements are discussed separately for activities, capabilities and resources. Contrary, however, conceptual elements and activity drivers represent either general strategic firm orientations or generic industry factors requiring firm specific adaptation, which are not fit oriented and consequently not differentiated.

External market Activity drivers	**Underlying concept** Strategic orientation		**External fit**	**Constitutional elements**	**Internal fit**
• Customer satisfaction and demands for increasing volume • Economies of scope and scale • High prices and total customer cost • Economies of modularity • Economies of quality	• Customer centricity • Fulfillment of customer needs • Employee orientation	Activities	• Capture customer needs • Establish close customer relationship • Strongly position and align brand with customer perceived value	• -	• Focus on architecture and processes • Focus on manufacturing technology • Decompose and reconstruct the value chain
		Capabilities and resources	• Capability to identify, evaluate and capture market opportunities • Strong brand • Capability to innovate and generate customer value	• Culture fostering collaboration and knowledge exchange • Capability to pragmatically execute • Capability to provide clear orientation through objectives and incentives	• Capability to operate stable, but flexible, computer integrated manufacturing • Manage system based • Culture fostering employee commitment to HS concept and customer satisfaction

FIGURE 59: ELEMENTS SUBSTANTIATING THE RESEARCH CONSTRUCT

Activities are oriented towards achieving fit either internally or externally. In addition, some capabilities and resources constitute HS without possessing a primary internal or external focus.

All externally oriented activities ‘capture customer needs’, ‘establish close customer relationship and ‘strongly position and align brand with customer perceived value’ direct to the underlying concept of ‘customer centricity’ addressing the activity drivers of ‘customer satisfaction and demands for increasing sales volume’ and consequently ‘economies of scale and scope’. From an activity driver point of view, however, this is only one side of the coin. The other side is high prices *and* lower total customer cost as well as concept specific economies of substitution and quality. HS firms achieve this through activities providing internal fit. Internal fit, allows fulfilling customer needs through modular architectures, sophisticated manufacturing technology and by decomposing and reconstructing the value chain in customer value generating activities the firm necessarily needs to keep internally and those standard or neutral activities, which can be supplied from externally.

The firm’s stock of capabilities and resources supports this stance by providing externally oriented capabilities ‘to identify, evaluate and capture market opportunities’ and ‘to innovate and generate customer value’ as well as ‘to position and align brand with customer perceived value’. The capabilities and resources engaged in internal fit are ‘operate stable, but flexible computer integrated manufacturing’ and ‘manage system based’. Furthermore, the ‘culture fostering employee commitment to HS

concept and customer satisfaction' is essential for internally directed activities. In contrast to activities, however, some elements of capabilities and resources are not focused on fit. These elements are a culture 'fostering collaboration and knowledge exchange' as well as the two capabilities to 'pragmatically execute' and 'to provide clear orientation through objectives and incentives'. In principle, two possible explanations exist for this non-fit assignment, either theses elements are not affecting fit at all or are general in nature and underlie both types of fit. However, due to the multidirectional orientation of each of the three elements the last explanation seems likely as all elements are potentially applicable to both types fit.

Based on the above substantiation of the research construct two real mechanisms achieving external fit can be determined. First, the generative mechanism of capturing customer information necessary to focus internally directed activities on customer perceived value. Second, the mechanism of strongly positioning and aligning brand with customer perceived value indicating customer's the value proposition of the HS firm in general, and its products and services in particular. These are absorptive mechanisms. However, this promise needs to be fulfilled by internal operations. Thus, external and internal mechanisms are intertwined and need to be strongly aligned. Internally, two adaptive mechanisms operate on the real level. First, system theory based modularity applied across various dimensions such as product and process architectures, manufacturing systems and even the value chain and second, a strong focus on flexible manufacturing for introducing modular principles. Both these mechanisms are supported by the firm's stock of capabilities and resources either directed to one or both of these mechanisms. However, of the three, from the research construct derived, hypothesized mechanisms only the two above mentioned materialize in this research. The third 'balancing' mechanisms appears not evident. However, the two internal mechanisms of 'system theory based modularity' and 'strong focus on flexible manufacturing' provide enough flexibility to offer balancing potential indicating a need to align internal and external HS requirements.

VII. CONCLUSIONS, IMPLICATIONS AND LIMITATIONS

This chapter draws conclusions from this research's findings. Based on these conclusions, implications for practice and theory are derived. In addition, this chapter illuminates the limitations of this research. Finally and based on implications and limitations, future research opportunities are presented.

A. CONCLUSIONS

This paper aimed at extending research on strategic management by identifying the common underlying concepts, elements and mechanisms of HS. In order to achieve this, ABV was applied for identifying HS underlying concepts, drivers, activities, capabilities and resources. Reviews on theoretical and empirical literature revealed that only few and limited research was previously executed on identifying HS capabilities and resources. In particular, most previous research focused on other objectives. Thus, findings on activities, capabilities and resources were, if at all, achieved coincidentally. This thesis intended to close this lack of research by focusing on identifying common elements and underlying mechanisms of HS.

As a first step in this endeavour, consistent and sustainable sequential and concurrent HS concepts were developed providing the basis for deriving specific HS models. In total, four consistent and sustainable types were identified: SQHS, VCHS, QCHS and ICHS. In a second step, commonalities among HS types were theoretically identified and a synthesized HS model was derived. Based on this model, the research problem was outlined and a research philosophy determined for identifying HS underlying mechanisms and elements. The particular research philosophy selected was critical realism allowing to investigate the 'deep' similarities in generative mechanisms (Yin, 1994; Bhaskar, 2008). Based on this philosophical stance, a research construct was developed assigning elements and mechanisms on three different domains of reality. The research construct was then applied for explicating research questions. In total, five research questions were identified addressing (1) consistency of HS strategy concepts, (2) implementations, common activities achieving (3) external and (4) internal fit and (5) required common capabilities and resources deployed for achieving both types of fit.

Considering the explanatory and qualitative nature of this research, a non-standardised, face-to-face, semi-structured, and open-ended interview approach allowed to identify the common conceptual, relational and constitutional elements as well as underlying mechanisms of HS. In order to collect all neces-

sary information to answer the research questions interviews followed a two-step approach comprising components of appreciative inquiry and laddering.

For selecting firms, the most often pursued financial and market performance indicators - ROI, revenue and profit, sales growth and relative market share – applied in previous research on HS were used for selecting firms listed on major stocks in Germany, Austria and Switzerland or representing successful, non-stock-listed 'hidden champions' (Simon H. , 2012). Hereby, from a critical realist point of view the empirical event of performance hypothesized for HS was assumed fulfilled. Furthermore, the hypothesized actual events of applying competitive weapons and thus realizing competitive advantages were supposed to be present due to empirically evident high firm performance. This founded the basis for literal replication allowing identifying HS real mechanisms. Of the 88 firms addressed, five firms – one stock-listed and four hidden champions – agreed to participate in this research. In total, 12 interviews were executed.

The empirical analysis of the appreciative and the laddering interview parts allowed answering the research questions and substantiating the research model. In result, adaptive and absorptive mechanisms were identified. The real mechanisms consist of different types of elements: conceptual elements determining the general strategic orientation, activity drivers representing generic industry requirements, which need to be firm specifically adapted as well as constituting and relational elements. Constitutional elements are capabilities or resources important for constituting HS, while relational elements are activities, capabilities or resources applied for generating external fit with activity drivers or internal fit within the firm's activity system to fulfil customer needs. For distinguishing both types of elements, ladder element analysis was applied to identify the most important elements, while ladder analysis was used to determine relations among them. This analysis approach provided answers to all research questions and allowed to empirically substantiate the research construct.

The research revealed that HS firms apply intended and consistent, but mixed strategy concepts based on generating high customer utility allowing to align competitive weapons of differentiation and price or total customer cost. The importance of 'low total customer cost' extends the theory on HS assuming low prices a competitive weapon of HS.

Moreover, HS concepts centre on three strategic building blocks: 'customer centricity', 'fulfilment of customer needs' and 'employee orientation'. This research indicates that firms apply activities primar-

ily for achieving fit, while each of the relational activity types is in parallel constitutional. However, no activity is directing to both internal and external fit. Furthermore, results show that HS firms are not focusing purely on external *or* internal alignment but combine both.

From an ABV perspective HS firms dedicate external activities to two specific activity drivers and internal activities to three different activity systems. The main MS activities directed to the external activity driver 'customer utility' are 'capturing customer needs and focusing on customer perceived value' as well as 'establishing close customer relationship'. Activities directed to 'price' or 'total customer cost' are 'ensure or quickly restore product usability' and 'focus on enabling customers in applying products'. Key relational activities focusing on internal alignment comprise mainly RD, operations and infrastructure activities of which 'focus on architecture and processes', 'apply customer information in RD', 'early involve manufacturing' and 'continually improve products and processes' are most important. Key operational and infrastructure activities are 'focusing on manufacturing technology' and 'decomposing and reconstructing the value chain'. Thus, internal activities for fulfilling customer needs can be subdivided in three distinct activity systems: one achieving modularity, one focusing on quality and one orienting towards employees.

Key relational capabilities and resources deployed in internal activities are management capabilities of 'manage system based', 'educate and sustain employees' and 'provide objectives and incentives'. Furthermore, the operational capability of 'operate flexible, computer integrated manufacturing' is of essential importance. Relational elements applied by external activities are mainly categorized in management and operational capabilities as well as operational resources. While the key internal management capability is 'identify, evaluate and capture opportunities', the primary operational capability is 'innovate and generate customer perceived value'. Contrasting previous theory, also two important resources 'strong brand' and 'long-term investment' were identified.

Based on these answers, the research construct was substantiated in two ways: by determining the most important, constituting elements and by delineating the critical relational elements to achieve internal and external fit. Overall, two absorptive mechanisms achieving external fit were determined: first, the generative mechanism of capturing customer information necessary for focusing internally directed activities on customer perceived value and second, the mechanism of strongly positioning and aligning brand with customer perceived value. Furthermore, substantiating the research construct indi-

cated linkages between external and internal adaptive mechanisms requiring internal mechanisms to apply customer information generated by external mechanisms. However, while the results support the theoretically hypothesized absorptive, external and adaptive, internal mechanisms, the third hypothesized mechanism of 'balancing' was less evident. Nonetheless, the two internal mechanisms of 'system theory based modularity' and 'strong focus on flexible manufacturing' provide flexibility and offer general balancing potential. The firm's capabilities and resources support both internal and external mechanisms. Thus, the mechanisms of capturing customer information and positioning and aligning brand with customer perceived value enable external fit, while the internally directed mechanisms of modularity and flexibility allow fulfilling customer needs.

B. IMPLICATIONS

This research affects both strategic management theory and practice.

B.1. IMPLICATIONS ON STRATEGIC MANAGEMENT THEORY

First, the specific approach selected for this research advanced knowledge in two different ways: first, through applying a new combination of methods and second, through generating deeper understanding on the underlying mechanisms of HS.

Combining critical realism and ABV with a case study approach including components of appreciative inquiry and laddering interview allowed generating new insights. In particular, this combination underpinned the importance of ABV in identifying the numerous micro activities making up HS (Johnson, Leif, & Whittington, 2003, p. 3). Future research should elaborate on this fruitful symbiosis of critical realism and ABV to further investigate the 'black box' of activities and probe deeper and gain better understanding "of the micro-mechanisms of business models" (Zott & Amit, 2010, p. 224). In this respect, however, the field of strategic management needs to move one step ahead in terms of non-positivist research philosophy, qualitative research methods in general and case study research in particular. Furthermore, applying appreciative inquiry and laddering interview, both rooted in marketing research, opened up new ways of generating and structuring rich data. Future research requiring differentiation of conceptual, constitutional and relational elements can apply on this.

Second, the research advanced theory by distinguishing consistent and sustainable HS – namely sequential and concurrent types – from inconsistent, management based types. While this research identified four consistent and sustainable HS types, further research is required to ensure that this selection is

comprehensive. Moreover, one inconsistent, management based type was identified questioning the validity of the underlying assumption of 'balancing tensions through management actions' made by research on organizational ambidexterity. Furthermore, the results support previous theoretical contributions on HS emphasizing activities and empirical research focussing on capabilities. However, it also extends both streams of research by identifying important resources, which were neglected in previous research. Additionally, this research advanced theory by extending the repertoire of competitive weapons applied by HS through identifying total customer cost substituting low price for achieving customer satisfaction and gaining market share. This implies that customers apply a dynamic, time-based concept of cost rather than a static, situational price consideration implicitly assumed by previous research. In each case, however, this effect requires further theoretical examination on for example 'how do total cost advantages originate and actualize for customers' and empirical investigation on for instance 'what practices apply firms for achieving customer awareness on total cost advantages'. Furthermore, the research supports previous theories distinguishing up- and down-stream activities directed to either differentiation or cost (Proff & Proff, 1997). However, while this separation is fully supported for distinguishing activities, for capabilities and resources including constitutional elements a different categorization is needed. Furthermore, this research found no pure focus of activities on either differentiation or cost. Rather, firms apply activities to achieve both simultaneously, such as service activities lowering customer's total cost and the quality perception of the firm's products. Therefore, further research is required to investigate the role of constitutional capabilities and resources for example in supporting externally or internally directed activities.

Moreover, comparing the concepts and drivers of different HS types reveal one common characteristic: an extensive focus on customer satisfaction. This supports theoretical contributions suggesting that HS are 'benefit', 'value' or 'customer value strategies' focusing on customer utility through variety, individualization, quality and innovation (Chrisman, Hofer, & Boulton, 1988; Kordupleski, Rust, & Zahorik, 1994; Woodruff, 1997). In this line of reasoning, the results of this research support prior theoretical and empirical findings on the importance of involving customers in the value generation process (Dickson & Ginter, 1987). Another important finding of this research is that HS firms mix 'hybrid' orientations instead of following pure concepts. Based on that, future research is required to determine if HS firms are following a dominant orientation complemented by elements of other concepts or if they are really combining several concepts with each other. The current state of HS theory

would suggest, that deviations from pure concepts lead to inconsistencies resulting in tensions required to be resolved by management intervention. This research's indication of two activity systems operating in parallel, however, points to the direction suggested by ABV theory of networks of overlapping activity systems or simply activity networks consisting of interdependent activities within a firm's boundaries (Blackler, 2000; Zott & Amit, 2010). In this line of reasoning and extending the sequential HS paradigm, activity systems are disturbance producing systems, forcing their own development and thus, multiple orientations could represent transitional states of system internal amendments (Engeström, 1987). Furthermore, the importance of long-term customer orientation in respect to total customer cost found in this research supports the underlying logic of ABV stating that firms receive payment for activities they perform rather than products per se (Sheehan & Foss, 2007; Porter, 1985). Thus, this research supports ABV in stressing the role of firm activities in achieving competitive advantage through the engagement of a firm's resources and capabilities (Sheehan & Foss, 2007).

Finally, this research focused on three distinct mechanisms operating on the real level and generating competitive potential in terms of providing competitive weapons applicable in competition. First, the external mechanism of exposing a firm's resources and capabilities to market processes realizing their value and ability to generate competitive advantage. This explains 'how resources and capabilities are applied to achieve competitive advantage' and 'what describes the building blocks used for achieving competitive potential'. Second, the internal mechanism responsible for adapting a firm's activity system and its stock of capabilities and resources and thus, answering 'why a firm's internal mechanisms are generating more value than a competitor's'. Finally, the (re-)balancing mechanism of identifying and determining balancing requirements for achieving fit between a firm's activity system and its industry's activity drivers. The distinction between two and three is one of static and dynamic perspective meaning that while in a static view balancing would not be an operative mechanism, it becomes from a dynamic point of view. This explains why some firms despite possessing all prerequisites in terms of activities, resources and capabilities for successfully addressing a market's activity drivers fail. This occurs, as their balancing mechanism is inadequately aligning or balancing external and internal consistency. In this research, however, this mechanism was not evident. One reason for that could be that this mechanism is of inferior importance as it is substituted by consistent HS concepts' ability to balance a firm's internal system with its external market needs. Nonetheless, further research is needed on each

of these mechanisms and particularly the third, requiring for example theoretical replication across strategy types in one industry.

B.2. Implications on strategic management practice

On top of theoretical advancements, this research affects also the practice of strategic management with actors in firms as well as industry policy making.

Starting with the firms, first and probably most importantly, managers need to understand that consistent concepts, with a focus on one primary orientation allow combining two competitive advantages, are at the heart of HS. Without such a consistent concept, management is forced to constantly 'manage' a firm's activities, capabilities and resources on micro-level most likely resulting in unsustainable and fallible strategy implementations. In contrast, following a consistent concept allows activating the underlying absorptive and adaptive mechanisms of HS. These mechanisms, in turn, depend on three distinct building blocks. First, customer centricity focusing on considering the firms' structure, processes, products and services from a customer perspective gained through customer intimacy established by close relationships and intense involvement along the firm's value chain. Second, a comprehensive employee orientation focusing on educating and motivating employees and third, keeping the firms' promise of fulfilling customer needs. Thereby, fulfilling customer needs consists of flexibly designing and manufacturing products based on modular principles and a strong value chain orientation as well as enabling the customer in using the product allowing realizing its full benefit.

Moreover, the synthesized model developed and empirically tested in this thesis offers firm decision makers a 'blueprint'-like orientation of which activities, capabilities and resources to focus and if necessary to maintain, develop or acquire. Thus, it can act – even without a guarantee for success – as a guide to simultaneously achieve multiple competitive advantages. For this, however, managers need to consider the complementary relationship of activities, capabilities and resources for exploiting HS full potential (e.g., Cusumano and Nobeoka, 1998; Garud and Kumaraswamy, 1995). Therefore, firms need to consider two sides of the same coin by determining consistent HS concepts and required activities, while appreciating - if necessary even developing or purchasing – the capabilities and resources necessary to implement and operate these concepts. Practically, this means for example, firms need to decide on their concept - e.g. modularity in products, processes and systems – determine required activities –

such as loosely coupling customer neutral, standard product components – and posses or develop the required capabilities and resources – e.g. capabilities to modularly design products or to manage a multitude of product variants. This research provides insights on the conceptual, constitutional and relational elements required to implement and operate HS. For that reasons, type-specific activities, capabilities and resources are described and commonalities across types are presented founding the basis for operating HS successfully in practice.

In addition to these firm level applications of findings, managers can benefit as individuals from this research's findings by adapting their individual management approach to more pragmatism, system or value based orientation and authority decentralisation. By this, the teams' and the employee's commitment and personal responsibility is raised allowing to achieve even such ambitious goals like to combine competitive advantages.

Implications from this research, however, reach beyond the firm and management level to policy making and industry standard setting. In analogy to the individual firm, policy makers can apply the synthesized model to set education or industry standards for steering firms or industries to 'higher' levels of performance. Or even more, they can adapt or set external conditions for fulfilling them. As for example quality is shown to be a central conceptual element of HS, this could be fostered by industry standards.

Furthermore, considering that the firms participated in this research are rather old with 4 of the 5 firms are hundred years or older and privately owned with only one exception, firm values and objectives differ to 'modern', more short-term and especially stock market oriented firms. In this respect, policy makers could refine their funding of start-ups and focus on entrepreneurs as individuals who are willing to build something lasting. In this line of vein, policy makers should foster a long-term orientation of owners and shareholders. However, as all HS require a higher initial period of time and investments for implementing the concepts of modularity, variety, quality or innovation, an extensive stock market orientation can prevent the diffusion of HS in practice. However, for those firms able to establish this long-term orientation and implement HS successfully, outstanding performance seems evident as shown by the participating firms' market leadership.

C. LIMITATIONS AND OUTLOOK ON FUTURE RESEARCH

Limitations of this research originate from the research approach as well as from the objective and scope.

The *research approach* is mainly limiting the results through applying a case study approach in general and interview methods of AI and laddering in particular. For these limitations see IV.D.3.3.

While the *research objective* of identifying common underlying mechanisms of HS required on one side to develop type specific profiles, it restricted on the other side the empirical focus on their peculiarities. This is something future research should further elaborate on. As one central element of these underlying mechanisms are activities, the ABV was applied, allowing focusing on 'detailed processes and practices which constitute the day-to-day activities of organizational life which relate to strategic outcomes' (Johnson, Leif, & Whittington, 2003, p. 3). This research indicates that ABV is promising in explaining deep mechanisms of competitive strategies and thus, future theoretical and empirical research on HS should foster its application (Zott & Amit, 2010). In particular, as previous empirical research concentrated mainly on capabilities and excluded activities and resources as essential elements of HS, this also offers future research potential. Underpinning this fact, this research identified resources such as brand or long-term investment as an important commonality in HS. Due to the research objective, the laddering part of the interviews was applied to identify essential relational elements of HS, but not to determine their relational intensity and direction among each other. Thus, future research is required to understand the relationships of elements in and among the different categories of activities, capabilities and resources. For this, critical realism and ABV currently underrepresented in strategic management research, provide future research opportunities allowing exploiting the field's full research repertoire.

Moreover, the *scope of this research* on underlying mechanisms of HS required restricting generalizability due to the application of literal replication on a preselected sample of cases. First and most importantly, the research questions focusing on HS commonalities required literal replication expecting similar results for predictable reasons (Yin, 1994). While literal replication generates reliability and information richness, theoretical replication creates external validity (Yin, 1994; Patton, 1990). Thus, future research applying theoretical replication or combinations of literal and theoretical replication on

a broader scale of firms is required to improve generalizability. Furthermore, the research scope required to preselect firms purposefully and homogeneously (Eisenhardt, 1991; Perry, 1998). This led to a small set of firms in scope and consequently only a limited number of 5 firms and 12 interviewees. While still in an acceptable but low range, future studies should focus on extending the scope and scale of this research (Perry, 1998). Furthermore, while preselecting firms based on dependent variables represents a severe problem in quantitative research, qualitative research is less vulnerable (George & Bennett, 2005). Nonetheless, future research is required avoiding that limitation by applying industry specific approaches across strategy types.

Independent on limitations, the results of this research indicate future research opportunities in terms of identified HS types, their real underlying mechanisms, as well as specific findings such as the competitive weapon of total customer cost.

The theoretical part of this research identified four distinct HS types and their underlying concepts, activity drivers, activities, capabilities and resources. However, this represents the starting rather than the end point on exploring HS. For that reason, more research on consistent concepts and their underlying elements is required to understand the 'deep' structures of how to successfully combine competitive advantages. The rewards for firms are evident as these kinds of strategies grant extraordinary performance.

On a more detailed level, this research identified three distinct mechanisms operating on the real level and actualizing competitive weapons applied in competition. First, the external mechanism of exposing a firm's resources and capabilities to market processes realizing their value and ability to generate competitive advantage. Second, the internal mechanism responsible for adapting a firm's activity system and its stock of capabilities and resources to an industry's generic activity drivers. Third, the (re-)balancing mechanism of identifying and determining requirements for achieving fit between a firm's activity system and its industry's activity drivers. The results of this research indicate that this 'balancing' mechanism is, however, of inferior importance suggesting that firms relying on a consistent HS concept somehow immanently poise internal system and external market needs. Therefore, further research is required for investigating the balancing mechanism's generative power and its sources in terms of activities, capabilities and resources.

Furthermore, this research newly identified total customer cost substituting price as one of the competitive weapons applied by HS. As this approach to compete on a long-term or dynamic cost basis is rather unexplored in theoretical and empirical strategic management research further investigations are required to cover for example questions such as ‘when do customers prefer total cost over price’, ‘how do customers perceive total cost’ or ‘what contingencies in terms of industry or product characteristics are important in order to apply this competitive weapon’.

In summary, this thesis advanced strategic management theory and practice by gaining a better and deeper understanding of the underlying mechanisms of HS and marks a starting point for future research.

APPENDIX

APPENDIX 1.1: OVERVIEW EMPIRICAL LITERATURE ON HYBRID COMPETITIVE STRATEGY

	Author	Year of publication	Research focus	Theor. basis	Competitive advantage	Strategy variables	Empirical data basis				Data analysis	Research results	
							Industries	Business units	Period	Data type		Superior hybrid strategy	Operational basis
1	Hall, 1980	1980	n.a.	IE	Cost, differentiation –combinable	n.a.	8	64	n.a.	Primary – interviews	n.a.	3 companies	
2	Hambrick, 1983	1983	Contingency theory	IE	Cost, differentiation, focus – independent dimensions	17	1	164	4	Secondary –PIMS	CA	Approach restricted to Porter types – however market share leading differentiator identified	
3	Philipps et. al., 1983	1983	Generic strategies	IE	Cost, differentiation - combinable	5	6	623	2	Secondary based on PIMS	CM	Strategic combinations exists in 5 out of 6 industries	
4	Zeithaml & Fry, 1984	1984	Market share – profitability paradigm	IE	Market share oriented competitive advantages	21	1	659	4	Secondary –PIMS	VA	Combinations of quality and cost advantages	
5	White, 1986	1986	Generic strategies	IE	Cost, differentiation – independent dimensions	4	n.a.	69	n.a.	Primary – questionnaire; secondary –PIMS	CR	19 business units	
6	Miller & Friesen, 1986	1986	Generic strategies	IE	Cost, differentiation, focus – one-dimensional, however contingency dependent combinable	29	1	102	4	Primary – questionnaire; secondary –PIMS	CA	Companies of several clusters combine competitive advantages	Quality and synergy management
7	Miller, 1987	1987	Generic strategies; contingency theory	IE	Complex product innovation, marketing differentiation, breadth, conservative cost control	20	18	271	5	Primary – questionnaire; secondary – book and case studies	CR	Marketing differentiator combining organic marketing orientation with production efficiency	Integration of conflicting orientations
8	Miller, 1988	1988	Generic strategies; contingency theory	IE	Innovation, marketing differentiation, breadth, cost	20	n.a.	89		Primary – questionnaire	RA, CR	Marketing differentiator	
9	Kim & Lim, 1988	1988	Taxonomic approach; generic strategies	IE	Cost, differentiation, focus	15	1	54	4	Primary – interviews and questionnaire	FA, CA	Cost leaders employing differentiation elements and vice versa	
10	Robinson & Pearce, 1988	1988	Relationship of intended strategies and planning	RBV	Exploratory approach	20	60	97	5	Primary – interviews and questionnaire	FA, CA	Companies committed to complementary strategic behavior of brand identification, channel influence	Planning sophistication
11	Wright et al., 1990	1990	Generic strategies	IE	Cost, differentiation, focus	15	1	67	n.a.	Primary – questionnaire	CA	Combinations of cost and differentiation with superior performance	
12	Wright et al., 1991	1991	Generic strategies	IE	Cost, differentiation, dual emphasize	7	1	56	5	Primary – questionnaire; secondary – Dunn and Bradstreet database	CA	Combinations of cost and differentiation with superior performance	
13	Roth & Morrison, 1992	1992	Global strategies	IE	n.a.	18	11	119	n.a.	Primary – questionnaire; secondary	FA	Strategic flexibility developed through arbitrage opportunities within multi-local system	Primary activities locally dispersed; central support
14	Parker & Helms, 1992	1992	Generic strategies	IE	Cost, differentiation, focus	21	1	79	5	Primary – questionnaire	FA	16 companies	
15	Miller, 1992	1992	Generic strategies	IE	Cost, differentiation, focus	10	n.a.	45	n.a.	Primary – questionnaire	FA	12 companies	
16	Reitsperger et al., 1993	1993	Relationship of quality and cost control in production strategies	RBV	Cost, differentiation, focus	4	1	38		Primary – questionnaire	CA	Companies combine cost and differentiation (especially quality) advantages	Capability to manage strategy and resource needs; consistency of value chain
17	Miller & Dess, 1993	1993	Generic strategies	IE	Cost, differentiation, focus – independent dimensions	13	1	715	4	Secondary – PIMS	VA	123 business units	Early market entry with 95% of which are pioneers or early entrants

APPENDIX 1.2: OVERVIEW ON EMPIRICAL LITERATURE ON HYBRID COMPETITIVE STRATEGY

	Author	Year of publication	Research focus	Theor. basis	Competitive advantage	Strategy variables	Empirical data basis				Data analysis	Research results	
							Industries	Business units	Period	Data type		Superior hybrid strategy	Operational basis
18	De Castro & Chrisman, 1995	1995	Relation of market entry and competitive strategy	IE	Cost, differentiation – independent dimensions	13	n.a.	599	4	Secondary – PIMS	CA	8 pioneers and 8 followers with HS	Investment and risk management, strategic change from differentiation to hybrid
19	Kotha & Vadlamani, 1995	1995	Generic strategies	IE	Price, marketing image, product design, quality, support, and undifferentiation	22	1	160	3	Primary – questionnaire	FA	Efficiency driven quality leaders	
20	Kotha et al., 1995	1995	Similarities and differences in emphases and patterns on generic competitive methods	RBV	Price, marketing image, product design, quality, support, and undifferentiation	22	1	285	3	Primary – questionnaire	FA	Balanced position of cost and differentiation in Japanese companies	Management of strategic consensus, integrative strategic understanding, aligned strategy formulation and implementation
21	Wright et al., 1995	1995	Relation of strategic orientation and competitive advantage	RBV	Cost, differentiation – independent dimensions	7	1	79	5	Primary – questionnaire; secondary – Dunn and Bradstreet database	FA, CA	18 companies show dual orientation	Developing of distinctive competencies - the more the better
22	Bowman & Ambrosini, 1997	1997	Relation of content, management consensus and performance	RBV	Cost, differentiation – independent dimensions	16	n.a.	32	n.a.	Secondary – questionnaire	VA	Combinations successful when management consensus on simultaneous cost and differentiation (differentiation is key)	Management consensus
23	Yamin et al., 1999	1999	Generic strategies	RBV	Cost, differentiation – independent dimensions	42	1	120	2	Secondary - Australian Best Practice Program	FA	21 companies	Production capability, flexibility, continuous improvement
24	Jenner, 2000	2000	Hybrid strategies	IE	Cost, differentiation – independent dimensions	4	1	220	1	Primary – computer supported interviews	RA	45 companies	
25	Campbell -Hunt, 2000	2000	Generic strategies	IE	Cost, differentiation – independent dimensions	21	n.a.	n.a.	n.a.	Secondary - 17 studies	MA	Cluster combining Innovation and production leadership	
26	Beal & Yasai-Ardekani, 2000	2000	Relation of competitive strategies and management functional expertise	RBV	Cost and innovation, marketing, quality and service differentiation	23	n.a.	101	3	Primary – questionnaire	RA	Combinations of cost various forms of differentiation	Accounting experience pre-requisite for achieving hybrid strategies combining with R&D, marketing, sales, engineering
27	Parnell, 2000	2000	Generic strategies; deliberate and emergent patterns	PS	Product and service breadth, perceived uniqueness, product and distribution efficiency	18	1	231	n.a.	Primary – questionnaire; secondary – Stock Quest database	FA	Combinations can lead to superior performance – however not each combination successful	Marketing expertise, production flexibility, speed
28	Spanos et. al., 2004	2004	Generic strategies	IE	Cost, marketing or technology based differentiation – independent dimensions	3	1	1921	2	Secondary – Greek manufacturing data base	RA	Performance increase with amount of combined competitive advantages; low cost component is key	
29	Kim et al., 2004	2004	Generic strategies	IE	Cost, differentiation – along a continuum allowing combinations	n.a.	n.a.	n.a.	n.a.	Primary – questionnaire	FA	Integrated strategy combining cost and differentiation	
30	Acquaah & Yasai-Ardekani, 2008	2008	Generic strategies; transitional economies	IE	Cost, differentiation – independent dimensions	16	n.a.	106	1	Primary – interviews	FA	Combinations achieved sequentially – cost than differentiation	

APPENDIX 1.3: OVERVIEW ON EMPIRICAL LITERATURE ON HYBRID COMPETITIVE STRATEGY

	Author	Year of publication	Research focus	Theor. basis	Competitive advantage	Strategy variables	Empirical data basis				Data analysis	Research results	
							Industries	Business units	Period	Data type		Superior hybrid strategy	Operational basis
31	Pertusa-Ortega et al., 2009	2009	Generic strategies	IE	Cost, innovation and marketing differentiation – independent dimensions	31	n.a.	164	3	Primary – questionnaire	RA	Performance increase with amount of combined competitive advantages (as long as innovation and quality are constituent parts)	
32	Leitner & Gülden-berg, 2010	2010	Generic strategy; strategic change	IE	Cost, quality and innovation differentiation – combinations possible	4	7	91	10	Primary –recurring phone interviews with questionnaire; Secondary - Austrian Statistical Office	RA	23 companies following hybrid strategy with superior performance; strategic change positively associated with performance	
33	Parnell, 2011	2011	Generic strategies; resource based view	RBV	Cost, differentiation, focus	16	1	576	n.a.	Primary - questionnaire	FA	Superior combinations, dependent on strategic capabilities and regional market	Strong management and technology capabilities – importance of strategy
34	Claver-Cortés et al., 2012	2012	Relation of hybrid strategies and organizational design	RBV	Cost and marketing and innovation differentiation	17	n.a.	164	n.a.	Primary - questionnaire	RA	Combination of mechanistic and organic structural characteristics	Mediating role of organizational complexity, formalization, decentralization

APPENDIX 2: OVERVIEW ON THEORETICAL LITERATURE ON HYBRID COMPETITIVE STRATEGY

	Author	Research focus	Competitive advantage	Competitive mechanisms			Research results	
				Cost	Differentiation	Price	Superior hybrid strategies	Capabilities / resources / activites
1	Karnani, 1984	Game theory	Cost, differentiation – along a continuum allowing combinations; multiplicative relation	Direct cost and scale effects	Market share increasing effect from differentiation		Concurrent with multiplicatively combining advantages	
2	Gilbert & Strebel, 1987	Contingency theory	Cost, differentiation – independent dimensions of cost oriented process and differentiation oriented product innovation	Direct cost and scale effects from standardization		Price erosion along industry lifecycle	Sequentially combining beneficial change with beneficial intertia	Management of potential cognitive dissonance through different foci in value chain activities; simultaneous product and process innovation; shift from product to process innovation and vice versa
3	Kleinaltenkamp, 1987	Contingency theory	Cost , differentiation – independent dimensions with interdependent connections	Direct cost and scale effects from differentiation	Quantity increasing effect from differentiation		Concurrent with synchronous product and process innovations	
4	Wright, 1987	Micro economics	Cost, differentiation and focus - Independent dimension with combinations of focus and differentiation	Direct cost, scope effects from diversification	Quantity increasing effects from diversification		Concurrent through segmented value chain	Management of potential cognitive dissonance through different foci in value chain activities
5	Hill, 1988	Contingency theory	Cost, differentiation - allowing combinations depending on contingency factors	Scale, scope and learning effects from product line differentiation	Market share increasing effect from differentiation	Price elasticity effect of differentiation	Concurrent with implementation dependent on industry contingencies	Management of internal efficiency; quality and just-in-time production management; internal and external product differentiation
6	Murray, 1988	Contingency theory	Cost, differentiation and focus - independent dimensions combining customer preference oriented differentiation with	Scale, scope and direct cost effects, learning curve effects	Market share increasing effect from superior quality	Differentiation effect of pricing; inverse price differentiation relationship	Concurrent with segmented value chain	Management of potential cognitive dissonance through different foci in value chain activities
7	Jones & Butter, 1988	Production and transaction cost theory	Cost, differentiation and focus – Pure cost dimension combining transaction cost based differentiation with product based cost advantage	Scale, scope and direct cost effects	Market share increasing effect from differentiation	Price as indicator of differentiation strategy and compensation for transaction cost	Concurrent with trade-off between transaction and production costs as well as revenues	
8	Chrisman et al., 1988	Taxonomical consideration	Cost , differentiation – independent dimensions combining mass market, segments and focus				Concurrent from considerations on Porter's model	
9	Wright & Parsinia, 1988	Micro economics	Cost , differentiation – independent dimensions	Scale effects from differentiation	Market share increasing effect from differentiation		Concurrent with segmented value chain	Management of potential cognitive dissonance through different foci in value chain activities
10	Kotha & Orne, 1989	Contingency theory	Cost , differentiation and focus – independent dimensions with product and scope oriented differentiation and process oriented cost advantages				Concurrent with combination of complex process structures and product lines	
11	Knyphausen & Ringlstetter, 1991	Production and transaction cost theory	Cost, differentiation – Pure cost dimension combining transaction cost based differentiation with product based cost advantage	Scale, scope and direct cost effects, learning curve effects	Quantity increasing effect from differentiation	Pricing as compensation for transaction cost	Concurrent with trade-off between transaction and production costs as well as revenues	
12	Faulkner & Bowmann, 1992	Taxonomical considerations	Cost , differentiation – independent dimensions with internal cost and external differentiation success factors	Scale, scope and direct cost effects, learning curve effects	Market share increasing effect from differentiation at average prices	Price differentiation as indicator of customer perceived cost leadership	Concurrent with segmented value chain	Management of potential cognitive dissonance through different foci in value chain activities
13	Belohlav, 1993	Production cost theory	Cost , differentiation and focus – Cost dimension	Quality cost effects	Quantity increasing effect from quality		Concurrent through simultaneously efficiency and differentiation enhancing quality	Total quality management in production; cross functional, process oriented organisation
14	Fleck, 1995	Production and transaction cost theory	Cost , differentiation and focus – independent dimensions with differentiation generating cost advantages	Scale, scope, quality and innovation cost effects, learning curve effects	Quantity increasing effect from differentiation	Price legitimating effect of differentiation	Concurrent through cost decreasing differentiation	Simultaneous management of synergy, quality, time, complexity and flexibility
15	Proff & Proff, 1997	Value chain theory	Cost, Diff. & Focus - Independent dimensions with production directed to efficiency and marketing and	Scale, scope and direct cost effects	Quantity increasing effect from	Realized price premium as necessary prerequisite for HS	Concurrent decoupling of cost and benefit of activities within the value	Management of distinct value chain activities
16	Proff, 2001	Value chain theory	Cost, Diff. & Focus - Independent dimensions with production directed to efficiency and marketing and sales to differentiation	Scale, scope and direct cost effects	Quantity increasing effect from differentiation	Realized price premium as necessary prerequisite for HS	Concurrent decoupling of cost and benefit of activities within the value chain	Management of distinct value chain activities

APPENDIX 3.1: INTRODUCTORY LETTER FOR RESEARCH PARTICIPATION – PAGE 1

Hochschule München
Lothstraße 64
D - 80335 München

University of Plymouth
Drake Circus, Plymouth
UK - Devon PL4 8AA

«AddressBlock»

1st of August, 2013

Support for my PhD thesis

Dear Ms./Mr. ...,

I would like to invite you and your firm to participate in my research project jointly executed at the University of Applied Sciences in Munich and the University of Plymouth.

Why you?
The project focuses on identifying what enables some firms, to successfully outperform its competitors by combining a strong cost position with superior quality and innovative products. Based on your excellent past development over the last recent years I think your firm belongs to that group.

Requirements
Time required for study participation in form of a personal interview requires a maximum of 1.5 hours. Only 3 to 5 interviews with senior managers and executives from different organizational functions (e.g. research and development, manufacturing, marketing and sales) are needed. I guarantee that all data provided is handled confidential and used anonymized avoiding traces to the interviewee or firm participating.

Your value
You receive a summary of the results before the study is published. Additionally, an oral presentation or workshop can be organized for presenting your specific study results. Moreover, you are invited for the presentation of the final results.

Your participation
I very much would appreciate your participation. For participating, please fill the following page and mail, fax or email it to Hochschule München, Lothstraße 64, Sekretariat Zimmer 2.060, 80335 München, Fax +49 (0)89 1265-3902, Michael.Zellner@plymouth.ac.uk.

Thank you very much in advance for your feedback,

Michael Zellner

Research participation

APPENDIX 3.2: INTRODUCTORY LETTER FOR RESEARCH PARTICIPATION – PAGE 2

Hochschule München
Lothstraße 64
D - 80335 München

University of Plymouth
Drake Circus, Plymouth
UK - Devon PL4 8AA

To: Hochschule München
Michael Zellner
Sekretariat 2.060
Lothstraße 64
80335 München

Michael.Zellner@plymouth.ac.uk
Fax +49 (0)89 1265-3902

Company «Company_Name»

Contact person _____

_____

_____

Potential interviewees _____

_____

_____

_____

_____

APPENDIX 4.1: DESCRIPTION OF PARTICIPATING FIRM 1

1. Industry

The first firm is among the world market and technology leaders in lasers, laser systems, fabricating machinery and sheet metal fabrication machinery. It operates in the three different markets described in the following briefly.

The *machine tool industry* is characterized by moderate and constant growth rates of about 7%, which lead in 2012 to a new record value of 66.3 billion Euros of total sales (Gardner, 2013; VDW, 2013). World rankings show China in first place with a production volume of 14.7 billion Euros and a global share of 22% followed by Japan and Germany with shares of 21% and 16% respectively (Gardner, 2013; VDW, 2013).

The second market for *laser systems and material processing* also reached a record volume in 2012 of 7.9 billion Euros representing a growth of 9% (Optech Consulting, 2013). China and Europe, with a joint share of almost 50 % are dominating the demand for laser systems (Overton, Nogee, Belforte, & Holton, 2013). Consumer electronics was one powerful growth driver in the laser market in fiscal 2012, since laser systems are utilized to a significant extent for example in smartphone or tablet PC production. Sales were also strong in the automotive industry, where welding and cutting with lasers is constantly becoming more widespread (Overton, Nogee, Belforte, & Holton, 2013).

Furthermore, the firm operates in the medical technology industry offering similar to its other fields of operation significant market volume. Solely the German *medical technology* companies generated an overall sales of 22.3 billion Euro in 2012 with sales increases mainly based on foreign markets representing an export quota of roughly 68% (Germany Trade & Invest, 2013). In these foreign markets, German companies achieved a sales increase of 6.7% equalling total foreign sales of EUR 15.1 bn (Germany Trade & Invest, 2013).

2. Firm profile

The family-owned firm was founded almost hundred years ago and is based in Germany. With around 60 operational subsidiaries, the group is present in all continents including North and South America and Asia

as well as in most European countries. Its manufacturing is globally distributed in countries such as Germany, Austria, China, Czech Republic, France, Great Britain, Japan, Mexico, Poland, Singapore, Switzerland or the USA.

With about 10,000 employees it generates sales of more than 2 billion Euros. Thereby, international revenues account for almost two thirds of total sales. It operates three business units in the areas of machine tools, laser technology and electronics, as well as medical technology. In terms of sales, the first businesss machine tools business unit is the largest comprising machines for bending, punching, laser processing as well as for combining punching and laser processing. Furthermore, the business unit laser technology offers products including laser systems that cut, weld and surface-treat three-dimensional components. It provides high-performance lasers, rod, disk and fiberlasers, direct diode lasers, ultrashort pulse lasers, marking lasers and marking systems. In terms of sales its laser technology division ranks second within the firm. Finally, the medical technology business unit focuses on system solutions for operating rooms and intensive care departments. Its portfolio includes operating tables, operating lamps, ceiling-mounted workstations and systems as well as camera- and assistance-systems. Compared to the firm's other business units, medical technology is the most recent and least revenue contributing unit.

The group increased its RD efforts on a year to year basis by more than 20% leading to an industry leading RD ratio of almost 9% of total sales. Thus, every tenth employee performs RD activities.

Moreover, a specific improvement process fosters innovation by aiming at synchronizing production systems in order to fine-tune the use of employee capacity, material and equipment and thus, enable to achieve the best possible products with the least waste of resources.

The considerable investments in RD result in a multitude of innovation initiatives ranging from 'industry 4.0' or 'platform strategies' in machine tooling to micro processing, marking laser innovations, or extreme ultraviolet (EUV) lithography for microchips in laser technology.

Furthermore, the firm implemented quality principles through a total quality management system comprising the entire group. Additionally, the organization constantly certifies for EN 13485 covering the norms for medical products manufacturers. Moreover, for continually improving its quality the firm col-

laborates with external partners for enhancing its quality management control and thus, improving its quality management in manufacturing. On top of that, the firm is focusing strongly on efficiency and sustainability especially in regards to production input like material, power, gases, consumables and equipment, as well as water and floor space.

The firm's company culture centres on innovation and open communication. Unsurprisingly, the firm's and the firm's product innovations receive frequent awards such as the good design award.

Additionally, the firm is especially strong in production management. In many instances, such as by well-balancing capacity utilization across worldwide production plants, the firm sets the industry standard. One key for this achievement are new management methods enabling gaining detailed information on the firm's synchronized production system. Furthermore, shop floor management allows dynamically and flexibly adapting and adjusting capacity utilization. Thus, the group is especially successful in shortening delivery times and avoiding inventory through efficient and just-in-time production. Additionally, a platform strategy in its machine tool unit is providing an efficient basis for product variety while reducing product complexity.

The firm's objective is to maintain its position as an innovative and premium supplier for high technology products and services. For that reason, the firm focuses its own manufacturing capabilities on core components requiring purchasing non-core, standard competences from third party suppliers. Thus, the firm is capable of delivering high quality products or services at reasonable cost, with low delivery times and high flexibility allowing strengthening the firm's innovation position.

APPENDIX 4.2: DESCRIPTION OF PARTICIPATING FIRM 2

1. Industry

Firm two is among the world market leaders in cleaning technology. Its product offerings cover a broad range of industries such as automotive, transport, agriculture, construction, retail, healthcare, building service contractors, public services and hospitality. In automotive, for example, cleaning concepts focus on the specific requirements of car dealers, repair centers or filling stations. In each of its markets, the firm regards itself as the industry benchmark offering the optimum price-performance ratio within its product portfolio.

Its internal organization consists of two units: equipment for private use ranging from high pressure washers to watering devices and professional equipment covering economic and environmentally friendly high pressure cleaners, vacuums or scrubber driers.

Despite its undisputed market leadership, the firm is also busy with charting business strategies to overcome challenges, specifically for sustaining its leadership position through a constant flow of innovative products to cater to the ever-changing requirements of customers. Moreover, the company is challenged by enhancing customer awareness of environmental issues.

Total sales in the global professional cleaning equipment market amounted to 8.2 billion Australian Dollars (approximately 6 billion Euros) in 2010 of which mature markets in Western Europe and North America avcount for 80% (Inclean Magazine, 2011). The remainder is contributed by the rest of the world (RoW), including the BRIC-MT countries (Brazil, Russia, India, China, Mexico and Turkey). These markets are expected to represent the future growth markets (Inclean Magazine, 2011). The market is dominated by five global suppliers accounting for a total market share of almost 40%. The rest of the market is shared between roughly 100 mostly regional players. Traditionally, there has been very little consolidation among the manufacturers of professional cleaning equipment.

The demand for automated cleaning is closely related to living standards and wage costs, as higher standards of living drive a need for increased cleanliness and higher pay drives a need for automation. Western Europe and North America have hitherto been the largest markets, representing around 80% of the global

total; however, the fastest growth rates are expected to be in the RoW, specifically the BRIC-MT markets. The cleaning industry linked to global economy has particularly hit hard by the global economic slowdown in 2008-2009 when sales of cleaning equipment fell by up to 20% in mature markets such as Europe and the US and by 5 to 10% in BRIC-MT.

2. Firm profile

The second firm is family-owned and headquartered in Germany. In 2013, it employed more than 10,000 people worldwide with a steep incline of almost 50% compared to 2012. Additionally, as one of the world's largest manufacturer of cleaning equipment the firm sells its products on all continents with sales companies in more than 60 countries. Furthermore it offers customer service in all its locations, from more than 36,000 dealers in more than 160 countries. Its international cleaning projects provide evidence of cleaning equipment's capabilities. Objects cleaned with its equipment comprise the world's most renowned buildings, monuments and sites.

As innovation leader, the firm sets market standards in terms of technology, services and designs and provides highest customer benefits leading to highest customer satisfaction. In this line of reasoning, product innovations are key to the firm's success. This innovation focus is underpinned by both the amount of new product introductions and the overall product portfolio composition. While the company launched more than 120 new products, filed 50 new patent applications and reached more than 500 active patents, it also achieved to build up a product portfolio consisting of almost 90 % products aging five years or less. Consequently, the firm's brand is worldwide associated in both the private as well as professional sector for its top performance, innovation and quality.

In terms of quality and technology the firm is the world's leading provider allowing enabling its customers to solve their cleaning tasks in an economic and environmentally-friendly manner. In terms of ecology, the firm's tools are market leading allowing customers to use as little water as necessary and thus, reducing overall water consumption. Innovative solutions are applied allowing gentle use of resources. Additionally, plastic components of specific ecological products consist of mostly recycled materials and are free of

phthalates and PVC. Furthermore, packaging is made of FSC cardboards resolutely refraining from using polystyrene stuffing and environmentally-friendly employee behaviour is fostered through programs such as covering over 50% of cost of public transport or granting a discounted bulk order of job tickets for all its employees. Also it shares part of the cost of an ecological driving school for employees.

Moreover, the firm acts socially responsible by respecting local values and standards, human rights and the legal and social systems in all countries it operates. Accordingly, it handles resources gently and environmentally-friendly resulting in the firm being awarded frequently for its environmental engagement as well as its innovative concepts, designs and product solutions and quality.

Its customer orientation is based on establishing partnerships through open dialogue. Accordingly, the firm's future plans involve customer centricity focusing on taking care of a customer's total cleaning requirements. For further fostering this customer orientation, the firm's RD, manufacturing, purchasing, marketing, sales and service departments are constantly realigned on customer-centricity. This provides the basis for sustaining its market position in the future. Accordingly, the firm is well-known across all its markets for providing total customer solutions for every need, from small consumer market appliances to large industrial cleaning systems, in the cleaning world. Due to its innovation intensity the firm sets a key priority on creating awareness on its new products among its current as well as new customers.

Furthermore, it considers qualified and motivated employees enjoying their job as major success factors. In terms of internal and external cooperation the firm's relationships are governed by trust, loyalty, openness, fairness, reliability and mutual respect. Especially in production and purchasing, the firm integrates its suppliers into the value chain.

Additionally, the firm has a particular strength in terms of earnings and financial resources resulting mainly from its profitable growth in the past. Earnings are largely retained within the firm as the family-owners are strongly committed to the firm's development.

APPENDIX 4.3: DESCRIPTION OF PARTICIPATING FIRM 3

Detailed information on firm 3 and the industry it operates are either limited or inaccessible to the researcher. Probable causes for this lack of information could be the firm's family-ownership resulting in no obligation to publish firm reports. Furthermore, the structure of the industry dominated by only a few players competing for a relatively small amount of sales compared to the global digital photo market reduces analysts disposition to analyse the industry for addressing only a very limited demand. Nonetheless, the available information on the professional motion picture industry is briefly described in the following.

1. Industry

The third firm is among the largest manufacturers of professional motion picture equipment in the world.

As mentioned above, only a very limited amount of market information on the professional motion picture industry is available or accessible for this research. Consequently, the description of this firm's industry environment is less extensive than for the other firms.

The professional motion picture equipment market represents only a minor share of the total market. The global digital broadcast and cinematography cameras market was seized at approximately 757 m USD in 2012 (Frost & Sullivan, 2013). A moderate growth rate of around 1.4% from 2012 to 2017 is expected resulting in a total market size of 811.9 million USD in 2016. The following key factors drive market growth: increasing use of 2k and 4k cameras in digital movies, increasing demand for cameras from emerging economies, demand for digital broadcast and cinematography cameras from emerging economies with the demand for more HD channels, the rise in digital cinema screens, and the demand for higher quality TV and movie content (Frost & Sullivan, 2013).

The firm's total sales amount to roughly one quarter of a billion Euros in 2007. With possessing around one third of the total market share, the firm is one of the dominant players in the professional motion picture market. Indeed, many industry experts consider the firm as the market leader in the industry.

2. Firm profile

The firm was founded at the beginning of the 19th century and is family owned since that time. While having its headquarter in Germany, its operation and service facilities are spanning the globe with locations in Europe, America, Canada, Asia and Australia. Of its total 1,200 employees only 50% are located in Germany. It focuses on four industries with its business units cameras, lighting, archive technologies and medical applications. The camera business unit comprises digital cameras, cine lenses and pro-camera accessories, lighting covers lighting equipment and system services, archive technologies include archive, scan and laser solutions, and the medical unit includes scope and surgical imaging.

Moreover, the firm provides services in two areas: rental and post production. While rental provides rental services on the above described motion picture equipment, its post production services comprise film and TV services or visual effects. In addition, the firm is acknowledged for its high quality technical service allowing operating its equipment as efficient and effective as possible.

Its products – especially in its camera unit – mark the highest quality standards in the industry. Thus, each camera professional is familiar to the firm's products. Therefore, it is anything but surprising that the firm's movie picture equipment constantly wins the most renowned scientific, technical and engineering awards.

APPENDIX 4.4: DESCRIPTION OF PARTICIPATING FIRM 4

The data situation as well as the situation causing this lack of information of firm 4 is similar to firm 3. Nevertheless, the following presents the available limited information.

1. Industry

Firm four is family owned since more than a century and is based in Austria. The firm comprises more than 10 subsidiary companies supplying private and business customers in markets such as crystal glasses, optics, lightning, bonded abrasives as well as concrete sawing and drilling machinery.

Annual global sales of jewellery are estimated at EUR 148 billion in 2013 (McKinsey&Company, 2014). The future jewellery market is shaped by five key trends: internationalization and consolidation, growth of branded products, reconfigured channel landscape, 'hybrid' consumption, and fast fashion. The jewellery market is expected to grow at 5 to 6% each year, reaching EUR 250 billion by 2020 (McKinsey&Company, 2014).

2. Firm profile

Since more than a century, ownership of the firm is in one family. Group sales grew from 2011 to 2012 by around 7% and reached over 3 billion Euros. Thereof, the firm's business-to-business or professional service unit represent 65%. In terms of business units, the firm employed 25,000 employees of its 30,000-employee workforce in crystal business in 2012. Unsurprisingly, crystal business is the largest business unit and generated revenues of more than 2 billion Euros in 2012. The smaller business units for optical devices and abrasives generated together around 1 billion Euros.

The firm's product lines in its crystal business unit are jewellery and accessories, couture jewellery, watches, elements, filmed entertainments, home accessories, figurines, lighting, gemstones, and beauty products. It operates more than 2,000 own boutiques and concessions in roughly 170 countries.

In its optical unit, the firm offers high-precision long-range optical products meeting highest demands for quality and comfort. Its product range includes long-range optics for hunting, nature observation and birding as well as travel and leisure.

Its abrasive business is one of the world's leading suppliers of innovative solutions in grinding, cutting, drilling, honing, dressing and polishing. With almost 5,000 employees in roughly 30 production locations in 11 countries, the firm offers high quality products combined with local and individual service.

The firm's brands are among the world's leading consumer and industrial brands. Its crystal brand, for example, ranges among the premium consumer brands for fine crystals and jewellery. In addition, its optical product brand or its sawing and drilling machinery brand are well recognized among industrial customers.

The firm's mission is to continuing market leadership and being the driving force and most reliable partner within its industries. Correspondingly, the firm is determined to being responsible, imaginative, vigorous and passionate. The firm strongly elaborates cultural values briefly described in the following. First, 'being responsible' is described by always thinking and acting in the interest of the company and the impact the firm's actions may have on others as well as all employees taking care of the firm as a whole, and in return, the firm take care on its employees. In consequence, this means to walk the talk. Second, 'being imaginative' implying an open-minded and innovative firm culture in creating aesthetically unique product designs and solutions for customers. Third, 'being vigorous' signifying the firm's and its employee's dynamism and power. Furthermore, it denotes the strengths and benefits of the firm's global organization. Moreover, it represents the empowerment of employees for being effective and efficient, work as a team across the organization to achieve our joint ambitions of outstanding and profitable results. Additionally, 'vigorous' is associated with acknowledgment and performance rewards. Last, 'being passionate' connotes with striving for customers and customer loyalty by continuously surprising and amazing customers and building long-term relationships with the firm's external business partners.

The firm still follows the founder's motto 'to continually improve the good'.

APPENDIX 4.5: DESCRIPTION OF PARTICIPATING FIRM 5

1. Industry

The fifth firm is located in Switzerland and is specialized in hearing and wireless systems. The firm operates in more than 90 countries and employs roughly 9,000 employees in 2013. It is one of the leading manufacturers of innovative hearing care solutions. With around 25 sales entities in Europe, Americas and Asia, and roughly 10 production entities, research entities, and holding and finance entities, the firm operates on a global scale.

The firm develops and markets hearing care solutions in two segments: hearing aids and cochlear implants. Its hearing aids business unit offers two well-established global brands for hearing solutions through a broad range of personalized service channels. Additionally, its cochlear implants unit serves the cochlear implant market through another well renowned brand. Its product portfolio differs in terms of technology – either digital, analogue or programmable technology – applied.

Each of the firm's product lines differ in respect to technology and market positioning. For instance, its leading and most innovative brand in hearing aids and wireless communication solutions for audiological applications includes a unique solution that is placed deeply in the ear canal and can stay there for up to four months, completely invisible and hassle-free. In contrast, another product brand is focused on building strong, personal relationships with hearing care professionals and products for making a real difference in the lives of people with hearing loss. In this product line, the firm possesses a proven record of accomplishment for developing technological innovations that provide natural sound with exceptional speech understanding, and a relentless drive to deliver an exceptional customer experience. Furthermore, the firm operates a fast growing international professional service network of hearing care providers dedicated to delivering outstanding service and technology solutions for people with hearing loss. Finally, the firm offers the most advanced cochlear implant systems in the world designed to help children and adults with significant hearing loss enjoying clear, high-resolution sound, optimal speech understanding in noisy settings and an outstanding music experience.

More than 10 million hearing instruments are sold worldwide every year, with growth to be expected at a low-to-mid single-digit rate (William Demant Holding, 2013). Average selling prices are expected to remain stable in the medium term. The global wholesale market is around 4 billion USD per year. Furthermore, the industry is rather consolidated with six manufacturers holding a total market share of more than 90% (William Demant Holding, 2013). The main markets are still the OECD countries. 2-4% yearly unit growth is primarily driven by demographic developments. In addition, the industry is characterized by three trends. First, a stable, but competitive environment, second, a continuous need to adapt to changing market conditions and last, fundamentally positive market dynamics (William Demant Holding, 2013).

The firm's total sales amounted to almost 2,0 billion CHF in 2012/13 with a significant gross profit, net income and free cash flow of almost 400, 300 and 260 million CHF respectively. Assuming that despite owning retail outlets contributing to sales volume the firm is mainly generating revenues from business to business customers and thus, possesses a significant market volume (2 billion USD) of the total market (4 billion USD). Thereby, approximately one third of the total revenues result from each of the regions in Europe, USA and RoW. The firm's average sales growth and EBITDA in local currencies was 6-8% and 9-13% in 2013/14 respectively.

2. Firm profile

The publicly traded company focuses on understanding customers' articulated and unarticulated needs. Turning these needs into challenges is the firm's main motive ultimately driving its innovation leadership in products, solutions, and processes across all disciplines. The firm's goal is to make sure that all people, especially those affected by hearing loss, can hear their world and live their lives to the fullest. Therefore, the firm carefully listens to the input of current users of their technology and to the feedback of hearing care professionals working with their solutions day by day. Thus, the firm's purpose to make people hearing the world drives its rich pipeline of new products.

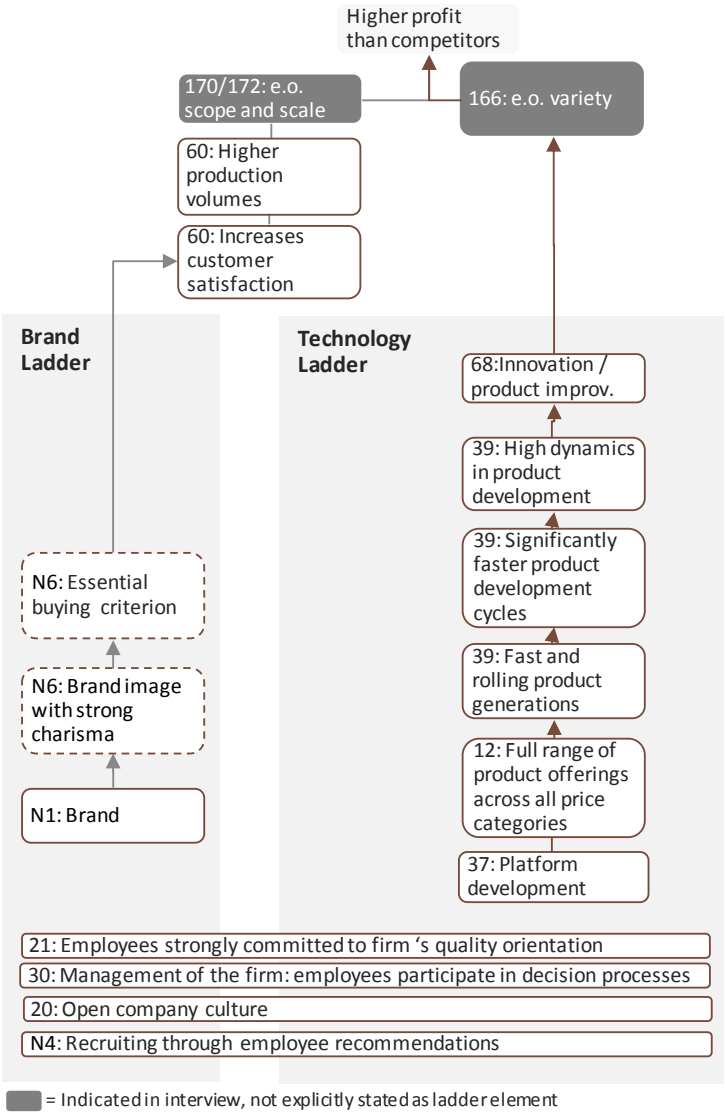
Accordingly, the firm's vision is directed to granting everybody in the world the delight of hearing and living a life without limitations. In this line of reasoning, the firm wants to be recognized as the innovation leader in the global hearing care market.

The firm centres on three core values: innovation, engagement and responsibility. Innovation, in the firm's definition, means to strive for being recognized as the innovation leader across all disciplines by offering the best solutions to customers and pushing the limits of technology continuously forward. As this will lead to business growth, however, the firm needs to remain pragmatic and able to quickly adapt to changing circumstances. Engagement, on the other hand, recognizes the importance of the firm's highly dedicated workforce for winning the hearts and minds of customers. For that reason, the firm believes in cross-functional teams in which every voice matters. In addition, the firm pursues a strong presence in local markets for understanding local needs in order to foster engagement. Finally, responsibility implies to strive for credibility and transparency for all stakeholders, taking the hearing challenges of customers as own and taking social responsibility serious by committing to the prevention of hearing loss and support of people affected by hearing loss.

Four pillars describe the firm's strategy. First, the firm's strategy is to maintain a balanced portfolio of profitable businesses for generating sustainable growth by successfully addressing the various opportunities and dynamics within its product lines and regions. Second, customer driven innovation, which is demonstrated by a target of investing roughly 7 % of sales into RD. This is of special importance in the hearing care market characterised by ample room for further progress in instruments, software, and services and thus, strongly reacting to innovation. Accordingly, the firm generated around 70 % of sales from products launched within the previous two years. The third and fourth strategic pillars of the firm are its strong competitive position and extending its market leadership. As the global hearing care market is country specific in terms of structure and dynamics the firm aims at expanding its accessible markets through a number of initiatives, including exploring the potential of fast-growing emerging markets like China.

Due to its high quality and innovative products, the firm was awarded for example with the Company of the Year Award.

APPENDIX 5.1: ILLUSTRATIVE EXAMPLE OF LADDER VISUALIZATION AND CODING



= Indicated in interview, not explicitly stated as ladder element

Firm	Interviewee	Ladder name	Ladder no.	Content coding (same elements consolidated)					Cross content coding (same elements consolidated)			
X	1	Brand	X.1	N1	N6	60	170	172	21	30	20	N4
		Technology	X.2	37	12	39	68	166				

APPENDIX 5.2: MAPPING OF ELEMENTS AND ABBREVIATIONS USED FOR LADDERING

	Underlying concept	Activity drivers	Common activity system and activities	Common resources and capabilities
Differentiation adv.	High product price *N9* Increase sales volume through customer satisfaction ***60***	Customer demands ***61*** Customer involvement ***62*** Total customer cost ***63***	I.1. Firm infrastructure ***23*** - Decompose and reconstruct value chain ***24*** - Collaborate in self managed teams and flat hierarchies ***25*** - Network with external partners ***26*** I.2. HR management ***27*** - Attract talents and develop employer reputation *N4* - Share and reuse knowledge ***28*** - Educate and motivate employees ***29*** - Involve and empower employees ***30*** I.3. Technology ***31*** - Apply sophisticated manufacturing technology ***32*** - Apply ICT for coordinating internal system and external value chain ***33*** I.4. Purchasing ***34*** - Apply selective outsourcing of customer neutral, standard, non-specific components ***35*** II.1. Research and Development ***36*** - Focus on architecture and processes, not products ***37*** - Concurrently plan, develop and engineer ***38*** - Continually improve products and processes ***39*** - Early involve manufacturing ***40*** - Apply customer information in RD ***41*** - Apply preventive, upfront measures for improvement or acceleration ***42*** II.2. Inbound logistics ***43*** II.3. Operations ***44*** - Focus on manufacturing technology ***45*** - Continuously improve operations ***46*** - Apply customer information in manufacturing ***47*** - Integrate product development and marketing with production planning and operations ***48*** - Invest long-term in manufacturing and ICT ***49*** II.4. Outbound logistics ***50*** II.5. Marketing and sales ***51*** - Position and align brand with customer perceived value *N6* - Focus on enabling customers in applying products *N7* - Establish close customer relationship ***52*** - Capture customer needs and focus on perceived customer value ***53*** - Apply ICT to quickly collect, aggregate and analyse customer information as well as disseminate it across functions and teams ***54*** - Continually measure, analyse and exchange knowledge on customers ***55*** - Research competitor and market information ***56*** - Research with focus on customer needs ***57*** II.6 Service ***58*** - Apply service to ensure or quickly restore product usability *N8* - Establish close customer relationship ***59***	Operational resources ***1*** - Strong brand *N1* - Motivate and highly qualified employees *N2* - Sufficient and long-term investment ***2*** Operational capabilities ***3*** - Capability to innovate and generate customer perceived value *N5* - Capability to implement and operate ICT ***4*** - Informational and analytical capability to process and analyse information ***5*** - Capability to operate flexible, computer integrated manufacturing ***6*** - Organizational and individual learning capability ***7*** - Capability to sense and respond to customer preferences ***8*** Management capabilities ***9*** - Capability to pragmatically execute *N3* - Capability to manage system based ***10*** - Capability to manage, combine and integrate knowledge ***11*** - Capability to identify, evaluate and capture market opportunities ***12*** - Capability to educate and sustain employees ***13*** - Capability to provide objectives and incentives for clear orientation ***14*** - Capability to build long lasting customer relationships ***15*** - Capability to integrate external partners ***16*** Company culture ***17*** - Culture fostering employee commitment to HS concept and customer satisfaction ***18*** - Culture fostering customer orientation and change affinity ***19*** - Culture fostering collaboration and knowledge exchange ***20*** - Culture fostering long-term orientation ***21*** - Culture focusing on mass markets ***22***
Cost decreasing effects	Direct cost reductions through concept specific economies ***6*** Direct cost reductions through utilizing concept specific quasi-public goods ***69*** Indirect cost reductions through differentiation induced volume increases ***71***	Economies of : -Substitution ***65*** - Variety ***66*** - Quality ***67*** - Speed ***68*** Economies of scope ***70*** Economies of scale ***72***		
Cost increasing effects	Direct cost increases through skill requirements Indirect cost increases through management complexity Indirect cost increases through transformational and operational risk Indirect cost increases through invest requirements	Labor cost ***73*** Complexity ***74*** Risk ***75*** Capital cost ***76***		

APPENDIX 6: PUBLICATION 1

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„Hybrid generic concepts and firm specific individualization:

Theoretically linking competitive strategies with strategic concepts,

activities and resources"

Michael Zellner

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HYBRID STRATEGIES AND FIRM SPECIFIC INDIVIDUALIZATION: THEORETICALLY LINKING GENERIC CONCEPTS, ACTIVITIES AND RESOURCES

Michael Zellner

School of Management, University of Plymouth Business School

Michael.Zellner@plymouth.ac.uk

Abstract - The purpose of this conceptual paper is to review the relevant literature and to explore a consistent concept of hybrid competitive strategies. It is argued that the current body of theoretical and empirical research on this topic largely ignored the link of generic concepts with a firm's activity system and its resources. The research on hybrid strategies is extended by integrating the resource based view of the firm with an activity systems perspective. Based on a variety based sequential hybrid strategy type the link between its underlying generic concept, activity drivers, activities, and its stock of resources and capabilities is described. Methodologically a general foundation of hybrid strategies is developed. Based on that, the mechanisms of sequential hybrid strategies are explained and detailed. Finally, a sequential hybrid strategy's underlying activity system and its underlying resources are conceptualized. On a collective level, hybrid generic concepts embed the required knowledge of activity drivers and activities defining the space of alternative positioning. Based on that, the activity system is individualised on firm level. As in strategic management research on organizational ambidexterity the prevailing role of management is stressed. However, the importance of management is not seen in managing 'tensions' within a firm's activity system directed to seemingly contradictory competitive advantages. Rather it is argued, that success of hybrid strategies is build on consistently applied concepts avoiding tensions within the activity system. The gap between generic concepts and a firm's individual stock of resources is closed by the activity based view. Two sources of management capability are essential in achieving sequential hybrid strategies: First, the capability to identify generic concepts applicable to the company and its corresponding context and second, to acquire or create, as well as to arrange and apply its stock of resources and capabilities within the activity system. The theoretically derived concepts demonstrate that explaining success of hybrid strategies requires consistently applied generic concepts on an activity systems level.

Keywords - Hybrid strategies, competitive advantage, activity based view

I. INTRODUCTION

Hybrid competitive strategies are compelling as they allow generating higher rents by combining several competitive advantages simultaneously. Also they are less vulnerability to changes compared to pure or no emphasis strategies as they better address customer needs, are more difficult to imitate, and generates a more flexible and wider view (Pertusa-Ortega, Molina-Azurin, & Claver-Cortés, 2009). The current body of research on what is termed 'combination', 'simultaneous', 'mixed', 'ambidextrous', or 'hybrid' strategies is comprehensive (Fleck, 1994; Mahr, 2010; Parnell,

1997), however theoretically and empirically far from conclusive and at least partly contradictory. This is especially disappointing as hybrid strategies are potentially fruitful in volatile and dynamic environments, most companies facing today (Proff, 2000).

Lines of reasoning for this ambiguity are threefold. The first line focuses on covering the full scope of strategic variety, the second regards varying measures of strategic success, and the third highlights operationalisation issues.

Many existing strategy typologies cover the scope of strategy variety incompletely or partially. One example is Porter's typology, which is still among the top mentioned schemes in empirical and theoretical research on strategic management (Allen & Helms, 2006, p. 2). Despite making clear recommendations on which competitive advantages to focus at (either cost or differentiation) and which, namely combinations, to avoid, his classification does not include a successful combination type. Rather Porter taxonomically includes an unsuccessful 'stuck-in-the-middle strategy', lacking a necessary distinction between successful and unsuccessful combination strategies. This might lead empirical researchers applying his scheme to confuse and mix underperforming 'stuck-in-the-middle strategies' with outperforming 'hybrid strategies' (Dess & Rasheed, 1992; Wright, Kroll, Tu, & Helms, 1991). In consequence, research on hybrid strategies based on Porter's scheme, may produce inconsistent and incomparable results (Chrisman, Hofer, & Boulton, 1988).

Further, strategic targets vary among strategy schools and thus, may bias comparability of empirical research. Examples for different targets are Porter's generic strategies based on company performance, Buzzel et al.'s market share, or Abell's scope and differentiation targets (Porter, 1991; Buzzel, Gale, & Sultan, 1975; Abell, 1980). Correspondingly, empirical results on hybrid strategies range on a continuum from 'prove of vitality' to 'below average performance'. In addition to different performance measures, studies also vary according to different comparison groups. Examples are studies measuring against all companies within an industry sample or comparing only individual strategy groups with one another (Mahr, 2010). Beyond that, some research on hybrid strategy assesses strategic orientations by subjective assessments of bundles or indicators of a company's resources and capabilities. These approaches, besides suffering the frequent shortcomings of subjective measurement approaches, are potentially biased as it remains unclear whether intended or measurable, emergent strategy patterns are observed (Mintzberg, Ahlstrand, & Lampel, 1999).

Last but not least, the few research examining operational concepts, activity systems, and resources and capabilities of hybrid strategies remains limited and fractional. Currently no theoretical or empirical research is available on linking generic concepts with individual levels of resources and capabilities in the context of hybrid strategies.

This paper aims at extending the research on hybrid strategies by integrating the resource based view of the firm with an activity systems perspective. Based on a variety

oriented sequential hybrid strategy type the link between its underlying generic concept, activity drivers and activities, as well as its stock of resources and capabilities is described.

The paper is structured the following. First, sources of competitive advantage are explained. Second, a theory of consistent and sustainable hybrid strategies is developed and one specific variety based type explained. Third, for sequential hybrid strategy a generic concept is developed, its underlying drivers revealed, and the activity system and corresponding consequences for a firm's resource and capability stock disclosed. Finally, results and limitations are discussed and future research opportunities outlined.

II. ROLE OF ACTIVITY SYSTEMS IN ACHIEVING COMPETITIVE ADVANTAGE

A. Sources of competitive advantage

While the notion of competitive advantage is one of the common themes in strategic management research, its origins are disputed.

According to one major school, the industrial organization's (IO) view, competition is mainly focused on achieving a favourable industry position (Mason, 1939; Bain, 1956; Bain, 1968). In this view competitive advantage is primarily determined by an industry's structural characteristics such as concentration, entry barriers, intensity of rivalry, or demand elasticity (Bain, 1956;). Specifically entry barriers are identified as serving as mechanisms for protecting abnormal profits and thus determine competitive advantage. While originally elaborated on industry level, in the theory's preceding the concept of entry barriers was also applied as mobility barriers on intra-industrial groupings. Thus the view advanced to considering heterogeneity, however restricting it to the level of intra-industrial groupings, what remains its main critique.

Another view on competitive advantage is the resource based view of the firm (RBV) focusing on unique resources and capabilities as drivers of superior performance (Barney, 1991). In this notion, competitive advantage results from firm heterogeneity and barriers to imitation (Mahoney & Pandian, 1992, p. 371). Hence, the possibilities of a firm are not a function of opportunities it confronts; rather a function of what resources an organization controls (Teece, Pisano, & Shuen, 1997). Consequently, competitive advantages are located 'upstream' of product markets (Teece, Pisano, & Shuen, 1997, p. 513). „ In this sense, strategic resources and capabilities are scarce, firm-specific, valuable and difficult to imitate. Thereby, a resource refers to a tangible or intangible firm asset or input to production owned, controlled, or accessed on a semi-permanent basis (Helfat & Peteraf, 2003). Contrary capabilities are special types of firm-specific resources enhancing the productivity of a firm's other resources by coordinating a set of tasks and utilizing resources (Makadok, 2001). Typically firms consist of and use a combination of resources and capabilities. Often resources are 'co-specialized' and value derives only from certain

combinations (Teece D. J., 2009). In addition, past investment decisions often lead to path dependencies (Mahoney & Pandian, 1992). ‚Distinctive competences', ‚core resources' or ‚core competences' are frequently used synonymously for capabilities (Selznick, 1957; Peteraf, 1993; Barney, 1986; Wernerfelt, 1984; Hamel, 1994).

Despite the different views on competitive advantage provided by IO and the RBV, both complement each other rather than providing alternative explanations of the origins of competitive advantage.

B. Competitive advantage and a firm's activity system

Recent developments in strategic research acknowledge the role of firm activities, routines, and business processes in achieving competitive advantage (Sheehan & Foss, 2007). The focus of the activity based view (ABV) is on activities, which are seen as the engagement of assets, resources and capabilities to serve a specific purpose toward fulfilling an objective. Correspondingly, activity systems are sets of interdependent activities within and across a firm's boundaries (Zott & Amit, 2010, p. 217). In this notion, previous research found certain combinations of activities to be more effective than others, what leads to the importance of configuring the activity system (Sheehan & Foss, 2007; Allen & Helms, 2006, p. 452). Activities can be considered on different levels such as top-level activities of planning, sourcing, manufacturing or delivering or at the level of sub-activities (Davenport, 2005). This allows a distinction between strategic implementations, which are factually inconsistent and those, which seem to be conflicting on high level, but are consistent on lower activity levels (Sheehan & Foss, 2007, p. 219). From an activity based view, competitive advantage results from "mechanisms through which resources and capabilities get exposed to market processes where their ultimate value and ability to generate competitive advantage are realized" (Ray, Barney, & Muhanna, 2004, p. 35). In this notion resources are stocks which have no value per se and can even destroy value if storing the resource, such as unemployed labour, generates cost. Converting the resource into capabilities determines, what can be done with the stock. Finally elaborating the capability in an activity generates value. For instance, underemployed labour is a cost-generating stock which is potentially value- creating if employed to produce something the market values and demands. Finally it needs to be stated that none of the above mentioned steps in isolation is sufficient to generate competitive advantage.

This notion is similar to Porter's value chain, which decomposes a firm's activity system into functions and activities from which competitive advantages result (Porter, 1985). However Porter adds another level of analysis to the ABV, the activity driver. Activity drivers represent "the underlying source of competitive advantage" (Pearce & Robinson, 2005, p. 104) and explain, why a firm's set of activities is generating more value than a competitor's (Sheehan & Foss, 2007,

p. 453). Drivers can be used to manipulate the value chain either in terms of cost and differentiation or in order to improve fit within a firm's activity system (Sheehan & Foss, 2007; Ghemawat, 2006). They are generic and structural in nature, what requires a firm's management to adapt drivers firm specifically. This way, drivers make competitive advantage operational (Pearce & Robinson, 2005). Competitive advantage then results from the sum of cost and value generated by each firm activity and can only be determined relative to a firm's competition (Sheehan & Foss, 2007).

Drivers are distinct from resources, as drivers need to be made controllable by the firm, while resources need to be organized and developed according to the logic inherent in a firm's activity system (Sheehan & Foss, 2007, p. 458). Also, drivers are generic, while an activity system is a concrete manifestation of how a firm does business. The manifestation occurs on two levels: the individual activity and the collective, overall activity system orchestrating all activities within a firm's internal and external value chain (Allen & Helms, 2006). Despite the unilateral relationship of drivers on collective level, on individual level single activity drivers operationally influence multiple activities and vice versa. This multilateral operational relationship leads to decoupling of activity drivers from an activity system and its constituent activities.

In summary, contrary to RBV thinking, ABV considers the availability of bundles of heterogeneous assets, resources and capabilities a necessary but not sufficient prerequisite for achieving competitive advantages. Rather it emphasizes the importance of transforming resources into competitive weapons through activities, routines and business processes (Porter, 1991; Stalk, Evans, & Shulman, 1992; Chrisman, Hofer, & Boulton, 1988). Competitive advantage rests on a firm's activity system, the performed activities and activity drivers. However, RBV and ABV are compatible (Sheehan & Foss, 2007, p. 452) and complement each other. While RBV is focusing on managing a firm's portfolio of resources, ABV is concerned about elaborating a firm's resource portfolio in the competitive process (Dierickx & Cool, 1989; Black & Boal, 1995). In this sense RBV is more static in nature and describes what pool of resources and capabilities is available to the firm. ABV is complementing this view by explaining how a firm's resource pool is applied and dynamically developed further.

III. A THEORY OF HYBRID STRATEGIES

A. Constructing a theoretical fundament of hybrid competitive strategies

Two common key characteristics exist in most strategy typologies, founding the basis for outperforming competitors: internal consistency and external sustainability. Some dispute exists on other construction characteristics, such as the principles of concentration and dimensionality.

1. Consistency

The system based consistency principle, widely applied in strategic management, follows the motive that strategies need to be constructed

and implemented avoiding system immanent conflicts (Acquaah & Yasai-Ardekani, 2008, p. 353).

However, in discussing strategic contradictions and their emergence, the unit of analysis is crucial (Gupta, Smith, & Shalley, 2006, p. 694). Potential units of analysis are organizations as a whole, a firm's activity system and its decomposed parts, as well as the individual level of resources and capabilities. Depending on the unit of analysis, conflicts can either be accepted and trade-offs made, conflicts can be resolved by balancing tensions or completely avoided through concepts allowing coherent implementations within a firm's value chain (Simsek, Heavey, Veiga, & Souder, 2009, p. 868; Fleck, 1994; Porter, 1980).

Research on March's exploration and exploitation strategies exemplifies parts of this development. Early research often claimed that combining different competitive advantages is impossible. That way, a firm's activity system can either be consistently aligned to exploration (cost advantage) or exploitation (differentiation advantage). The level of analysis is, despite mentioning a firm's activity system, the organization as a whole. Recent research on 'organizational ambidexterity' (OA), however turned to the thinking of balancing tensions of seemingly contradictory advantages. This led to a rich body of research identifying a firm's combinative properties and capabilities, such as context, culture or management skills (Gibson & Birkinshaw, 2006). Thus the original organizational focus shifted to an activity systems level and even to the level of (groups of) individual resources. However OA, still assumes immanent tensions and a necessity of trade-offs (Simsek, Heavey, Veiga, & Souder, 2009). Raisch and Birkinshaw make explicit this assumption by stating that "… managing two *inconsistent alignments* within an organization simultaneously is far more complex than managing one consistent strategy after the other or externalizing one of these activities" (Raisch & Birkinshaw, 2008). This 'inconsistency assumption' narrows the research spectrum of OA on hybrid strategies mainly on a firm's capability to manage unavoidable conflicts.

In contrast, comparably few researchers analyzed the existence and constitutional characteristics of hybrid strategies combining multiple competitive advantages consistently. (Pertusa-Ortega, Molina-Azurin, & Claver-Cortés, 2009; Claver-Cortés, Pertusa-Ortega, & Molina-Azorín, 2011; Morschetta, Swobodab, & Schramm-Klein, 2006; Acquaah & Yasai-Ardekani, 2008). Despite first mentioning the term hybrid strategies in 1995 by Fleck and in 1997 by Proff and Proff strategic combinations were identified ealier. Empirical researchers already recognized vital combinations of competitive advantages in 1980 (Hall, 1980). Shortly after this, theoretical concepts were developed explaining vital concepts of hybrid strategies (Karnani, 1984; Gilbert & Strebel, 1985). In Greek the word 'hybrid' means 'composed of incongruous kinds' or 'derived from heterogeneous sources' (Proff & Proff, 1997). Especially the last explains the word's application in strategic management as combining seemingly

contradictory competitive advantages. Frequently, however, hybrid combinations generate incongruous and thus temporal instable states. Therefore one key criterion of vital hybrid strategies is consistent combinations of competitive advantages. On a more specific level, consistent hybrid strategies need to implement activities impacting concurrently on for example exploitation drivers through some parts of a firm's activity system and exploration drivers through other parts. According to this consistency requirement of hybrid strategic concepts, two distinct hybrid strategy types can be differentiated. First, concepts that assume inevitable tensions within a firm's activity system require a firm's management to balance tensions. Such *management based* hybrid strategies conflict, however, with the consistency principle. The second distinct type regards concepts that coherently align a firm's activity system on multiple competitive advantages. Tensions do not occur as the implementation of activities favouring one competitive advantage simultaneously forward the achievement of another (Jiao, Ma, & Tseng, 2003, p. 809; Chrisman, Hofer, & Boulton, 1988; Fleck, 1994). Such *simultaneous* hybrid strategies are compliant with the consistency principle.

2. Sustainability

In order to sustain a competitive advantage a strategy has to be inimitable, unique and stable in nature (Barney, 1991). For this, collective design and market exposure of a firm's activity system and its underlying resource and capability portfolio is vital. The corresponding implications can be differentiated on organizational and individual level.

The fundamental question answered on organizational level is 'How resources are transformed by a firm's activity system into services and how (bundles of) resources are integrated?' One starting point for answering this question are generic competitive concepts available to all firms within an industry or even across industries (Sheehan & Foss, 2007).Such widely diffused generic concepts are sources of sustainable competitive advantage by influencing a management's decision making and thus impacting an organization as a whole as managers "…make selective strategic choices about accumulation and acquisition of firm resources, and these decisions, in turn, affect the potential for firm heterogeneity and sustainable advantage" (Bharadwaj, Varadarajan, & Fahy, 1993, p. 701). Besides managers decision behavior in implementing strategies, collective know-how is also comprised in structures, business processes or social norms fosters firm heterogeneity (Spender, 1994). While some scholars determine collective know-how as the aggregation of individual knowledge, meaning all learning within organizations is individual, others treat organizations similar to individuals in a way that organizations remember through its routines, procedures and by institutionalizing individuals' beliefs (Simon, 1991; March, 1991). In this paper a collective view is applied: Collective knowledge is embedded in collective ways of acting and thinking and manifests for example in a firm's culture or social norms and is emergent in nature

(Spender, 1994). Only this view allows identifying also core resources and capabilities on collective level

In conclusion, sustainability results from a management's capability to adopt generic concepts, to configure a firm's activity system and to develop a firm's resource portfolio in a firm's specific context altogether making a firm's strategy inimitable and unique. Further, the degree of conceptual adaptation necessary and/or the extent of collective firm specification required provide barriers to imitation. As changing collective firm attributes such as activity systems or collective knowledge is rather long-term, competitive advantage might be easier protected over time. This especially holds for hybrid strategies, which are more complex than singular or no emphasis strategies. In addition another sustainability driven benefit is provided from hybrid strategies complexity: adaptability due to the possible elaboration of several competitive weapons in unpredictable, dynamic and volatile environments.

For the above mentioned mechanisms to work, certain resources and capabilities need to be available or developed on individual level. While obviously, resources and capabilities are logically prior to firm activities, resources can also be a product of a firm's unique set of activities (Spender, 1994, p. 359). However, regardless of what resources and capabilities a firm possesses, 'it is never the resources themselves that are the inputs to the production process, only the services that the resources can render' (Penrose, 1959, p. 25). This point to the important difference between a resources latent market potential and the realized market potential achieved through actions. Chrisman et al. coin this 'competitive weapons', and explain them as "the primary ways the organization applies its skills and resources to meet environmental needs and create enduring competitive advantages" (Chrisman, Hofer, & Boulton, 1988, p. 415). Consequently a firm's competitive advantage is less dependent on resources and capabilities a firm owns per se, but rather on its way of exposing them in the market place. Analysing origins of sustainable competitive advantage on individual level must therefore start with identifying a firm's applied competitive weapons and based on that deducting the underlying resources and capabilities. Accordingly, a hybrid strategy's sustainability rests primarily on the complexity of combining multiple competitive weapons within the same activity system and only secondarily on (co-specialized) individual assets, resources and capabilities.

In total, a hybrid strategy's sustainability depends on identifying generic strategic concepts, analysing their applicability on a firm's specific context and environment, and, fit assumed, adopting and applying the firm's activity system accordingly. Thus, sustainable hybrid strategies necessitate fit and integration across all implementation layers. Ergo, it is not enough having the intention to be hybrid, rather it is compulsory to have the necessary resource potential and the ability to transfer them into market perceived

and valued actions. Therefore, the above mentioned construct is focused on realized strategies in the sense of observable patterns in a stream of actions reflected in resource deployment (Mintzberg, 1978, p. 935; Spanos, Zaralis, & Spyros, 2004).

Besides this two, commonly shared characteristics, others are more debated. The most important among them is Porter's concentration principle and its counterpart dimensionality (Porter, 1980; Campbell-Hunt, 2000).

The concentration principle postulates that firms need to concentrate on either one of Porter's two generic competitive advantages of cost or differentiation. Concentration, however, is not an objective of its own for developing and implementing strategies. Rather it is the consequence of assuming that competitive advantages are opposing each other and cannot be combined successfully. This contrasts to the principle of dimensionality, which is based on the assumption, that competitive advantages are independent and combinations are principally feasible. Both principles are either assuming consistency or inconsistency in combining competitive advantage. As already explained consistency depends on the level of analysis and thus cannot be generalized. The attempt, however, to find a principally applicable consistency principle across collective and individual level might be one reason for the widespread theoretical and empirical ambiguity on this principle.

B. Developing a theory of hybrid strategies

Constituent characteristic of hybrid strategies is the pursuit of multiple competitive weapons in the market place combining several competitive advantages simultaneously (Proff & Proff, 1997). From an activity perspective, these multiple competitive advantages arise from the application of generic concepts, its firm specific and consistent adaptation within a firm's activity system and its underlying activities.

In the strategic management literature three types of hybrid strategies are differentiated: Management based, sequential and concurrent hybrid strategies.

Management based types assume insolvable tensions resulting from ambidextrous strategic directions. Grounded on organizational theory their emphasis lies on management capabilities and organizational design. Based on the underlying assumption of managing inevitable tensions, however, the consistency principle is neglected. In addition sustainability mainly rests on a firm's unique organizational design and its distinctive management, however concepts and their corresponding implementations are suppressed.

In comparison sequential and concurrent hybrid strategies are based on the assumption of consistently applying concepts achieving multiple competitive advantages simultaneously. However they differ in the way of achieving these combinations. While sequential hybrid strategies imply enhancing competitive advantages synergistically one after the other, concurrent types achieve those combinations coinstantaneous. Further-

more, the underlying theoretical foundations vary between the sequential and concurrent types. While sequential hybrid strategies are based on systems theory, concurrent hybrid strategies are rooted in microeconomic theory applying concepts of variety, quality or innovation positively affecting multiple competitive advantages simultaneously. For an overview on the various hybrid strategy types compare figure 1.

For practical reasons of limiting the scope of this paper and as the paper's focus is to discover the link between hybrid strategy's generic concepts and resources and not to describe the full range of hybrid strategies the further discussion is restricted on sequential hybrid strategies.

IV. THEORETICAL FOUNDATION AND GENERIC CONCEPT OF SEQUENTIAL HYBRID STRATEGIES

A. Theoretical foundation of sequential hybrid strategies

Sequential hybrid strategies (SQHS) or 'outpacing strategies' combine competitive advantages by extending strategic focus over time (Gilbert & Strebel, 1985). This type is based on a dynamic strategy concept, matching or aligning organizational resources with environmental opportunities and threats (Venkatraman & Camillus, 1984). The major part of research on SQHS is empirical and based on the relationship between a firm's adaptability and its achieved performance (McKee, Varadarajan, & Pride, 1989; Snow & Hrebiniak, 1980). In essence, the key notion of sequential hybrid strategies is, that "… success results not from the single-minded pursuit of either strategy but from the ability to add one to the other at certain stages in the evolution of the market ...." (Gilbert & Strebel, 1985, p. 29).

However, key to success of SQHS is to identify the requirement, time and degree of strategic enhancements. All are mainly determined by the limits of pure strategies. March considers general limitations of exploitation by too much focus to the exclusion of exploration, which leads to competency traps, inertia, and finally obsolescence. Contrary, too much exploration to the exclusion of exploitation leads to failure traps, leaving firm's not gaining returns on their knowledge (March, 1991, p. 71; Simsek, Heavey, Veiga, & Souder, 2009). More specifically, strategic limitations can either originate from internal or external factors of a firm. External limitations on, for example, Porter's pure differentiation strategy are a lack of customer perception on increased product quality, or missing consumer price acceptance on incremental innovations (Knyphausen & Ringlstetter, 1991, p. 553). Both of these examples lead to a marginalization of differentiation efforts at potentially higher cost of production or transaction. Internal limitations on Porter's cost leadership are, for example, marginal benefits arising from additional investments in mature technologies, or too low initial investments generating economies of scale only insufficiently (Kloock & Sabel, 1993). Accordingly, Booth and Philip empirically find "… the emphasis was more on mix and match combinations of cost, differen-

tiation, and other incentives, rather than on any one generic posture".

Successively extending competitive advantages can only be explained relative to changes in a firm's organizational and environmental factors, as they determine the degree of adaptation necessary. Zajak and Shortell develop a model of dynamic fit based on two dimensions: Change required and change implemented (Zajac & Shortell, 1989, p. 431). They distinguish two 'dynamic fit' types, 'beneficial change' and 'beneficial inertia', from two 'dynamic misfit' types, 'excessive change' and 'insufficient change' and conclude that change is only one way successfully handling contingencies, while another is inertia. This is true on organizational as well as on individual level. Companies use flexibility on organizational level for improving their competitive position and their adaptability in volatile markets, while simultaneously using stability to reduce uncertainty. Similarly individuals seek predictable relationships and stability in behavior while simultaneously looking for variety and stimulation in organizational life (Leana & Barry, 2000). This indicates complementary relationships on organizational and individual level and considers both dynamic fit types as concurrent forces affecting organizational actions (Connor, 1999). This in turn specifies the activity system as the adequate unit of analysis for SQHS. Due to the sequential achievement of multiple competitive advantages, effectively attaining one, say differentiation, provides the basis for successfully utilizing another. In detail, achieving differentiation through fulfilling customers demand for an innovative product, production capacity could be raised and thus economies of scale increased (Parnell, 1998, p. 30). Therefore, a consistent and sustainable model of SQHS has to simultaneously pursue beneficial change and inertia on an activity system's level, with the premise that beneficial change compensates all associated costs and risks from changing. Only if the sum of all effects is positive SQHS is outperforming singular and no-emphasis strategies. Otherwise it will be stuck-in-the-middle.

B. A generic conceptualization of sequential hybrid strategies

Sequential strategic expansions are driven by internal and external change. Following Ashby's 'law of requisite variety', systems efficiency depends on the degree of fit between a system's internal and external complexity (Ashby, 1956). As individual firms have only marginal impact on external factors, sequential hybrid strategy's success depends on the adaptation of a firm's activity system, activities, resources and capabilities to its external environment.

System theory provides two important insights for adapting activity systems sequentially: First, adaptation efforts should principally kept small and second, should be limited to as few as possible and independent system parts. While the first depends on the required fit and is, as already mentioned before, mainly externally determined, the second focus on a systems' architecture. System architectures are defined by the Institute

of Electrical and Electronics Engineers Standards Association (IEEE-SA) as the fundamental organization of a system embodied in its components, their relationships to each other, and to the environment, and the principles guiding its design and evolution (IEEE Standard 1471). Accordingly systems architectures can be differentiated according to the intensity of coupling its subsystems and components. While adapting tightly coupled subsystems can even lead to the necessity of a complete systems redesign, loosely coupled systems allow adapting certain subsystems, without compromising the overall architecture (Orton & Weick, 1990). Accordingly, system theoretically conceptualizing a SQHS combining beneficial change with beneficial inertia requires loosely coupled, modular system designs (Sanchez, 1995) and is applicable to any complex system such as products, processes, organizational structures, knowledge systems, or even customers' utility systems (Baldwin & Clark, 2000; Sanchez & Mahoney, 1996).

On an aggregated level generic cornerstones of SQHS are modular product design and modular organization design. Modular product design supports SQHS by increasing product variety and adaptability through mixing and matching of components within existing product architectures. In addition modular designs increase production volume of individual components reused across product variants, families and generations. Similarly, reuse of existing product architectures, interfaces and components foster efficiencies in a firm's value chain beyond manufacturing. Moreover, the reuse of existing architectural designs, interfaces and components create efficiencies through emphasizing architectural level and core components critical to overall product performance and customer perception.

Modular organization design fosters SQHS by substituting overt managerial authority through embedding coordination in standard interfaces between decentralized units (Worren, Moore, & Cardona, 2002; Henderson & Clark, 1990; Schilling, 2000; Sanchez, 1995). This generates adaptability through reconfiguring a firm's activity system, activities and its underlying portfolio of resources and capabilities by flexibly 'mixing and matching' organizational units. Modular organizational designs also increase learning through reusing and transferring knowledge between decentralized organizational units.

V. LINKING ACTIVITY DRIVERS AND ACTIVITIES OF SEQUENTIAL HYBRID STRATEGIES

For analysing the competitive success resulting from the above outlined SQHS concept activity drivers need to be determined and linked to a firm's activity system and activities.

Activity drivers are generic and structural. They are structural 'in the sense that they represent abstract, relative or relational properties of activities, both in the context of the firm and in the context of the business value system the firm operates in (Sheehan & Foss, 2007, p. 453). Scale for example as a potential driver needs to be determined relative to the total product market

volume and has to be considered in relation to the scale of other activities performed in the firm. In this way drivers determine the space of alternative positioning. They are abstract as they need to be instantiated firm specifically. For scale a firm specific decision is required in terms of the amount of output produced. Drivers impact the activity system in two ways: First, they can improve an activity system's efficiency and effectiveness and second, improve the fit between activities within a firm's activity system. Typically multiple drivers need to be balanced and made operational within several activities of the value chain. Quality for example has its requirements in product development, inbound logistics and material, manufacturing, or outbound logistics. However the same functions are also affected by another driver as for example scale or flexibility.

Links between activity drivers and activities are mutual and manifold. Variety as a driver spans the space of alternative positioning for example for marketing by determining how many product variants are offered to certain customers or segments. Based on that, firm management decides on what position a firm wants to occupy within the space of alternative positioning. For example firms following a SQHS carry out variety supporting activities such as rapidly developing prototypes for real time market research based on modular product design. However, as seen in the example, variety impacts not only marketing but also other activities such as operations, firm infrastructure or technology. Conversely the activity, decoupling product design from technology on architectural level for example increases differentiation by fostering variety and simultaneously improves efficiency by lessening research cost per variant. In consequence, drivers and activities are not tightly bonded but form systems which need to be aligned with each other. Therefore, the identification of (groups of) activities impacting multiple drivers concurrently is the key prerequisite of hybrid strategies in general and SQHS in particular. According to Porter's value chain framework activities are differentiated in primary activities, directly influencing value generating activity, and support activities, only indirectly impacting drivers by affecting the performance of primary activities (Porter, 1985). Primary activities consist of inbound logistics, operations, outbound logistics, marketing, sales and services. Secondary activities consist of firm infrastructure, human resources, procurement and technology management. Porter's value chain is central as a framework for the analysis of a firm's strength and weaknesses as it allows evaluating each value chain function and activities (Stabell & Fjeldstad, 1998). Less frequently, however, it is applied to first- or second-order analyses (Hax & Majluf, 1992; Stabell & Fjeldstad, 1998). First-order analyses are used to assess the most important activities in terms of cost and value. Second-order analyses are more detailed and used to uncover structural activity drivers behind activities. For this research a two-tiered second-order analysis is applied on activity drivers and core activities, which sufficiently satisfies a strategic and management perspective (Stabell & Fjeldstad, 1998, p. 413). While, however Porter unnecessarily

limits value chain analyses to the activity level as the smallest possible entity, in this paper resources and capabilities as the ammunition of activity based weapons are added as elementary units of analyses.

In the following, first, differentiation and cost drivers of SQHS are discussed before, secondly, core activities and their interdependencies will be identified. An overview on SQHS generic concept and key activity drivers is provided in figure 1

A. Activity drivers of sequential hybrid strategies

1. Differentiation drivers

Major differentiation drivers of modularity are increasing variety and flexibility.

Product variety increases the diversity of product function, characteristics, and performance specifications (Dickson & Ginter, 1987; Sanchez & Mahoney, 1996). Variety improves positioning to heterogeneous customer preferences compared to integrated product designs and allows serving many more market segments than competitors not capable of designing modular products (Dickson & Ginter, 1987; Sanchez & Sudharshan, 1993). Furthermore, modularly adapted and updated products reduce the time to market of modified or new products. Besides this primary differentiation aspect, modular product architectures reduce test, change and adaptation costs for customers by requiring only certain components to be replaced if products advance (Nobeoka & Cusumano, 1997; Baldwin & Clark, 2000; Sanderson & Uzumeri, 1995; Schilling, 2000, p. 321). By this customers are enabled to participate in component based technology innovations, while only carrying the cost of adapting its current product configuration. This also founds the basis for continuous improvements (Sanchez, 1996, p. 128; Sanchez & Sudharshan, 1993). Last but not least, modular product design provides the basis for real time learning by leveraging product variants for market research and product adaptation according to customer needs (Sanchez & Sudharshan, 1993, p. 130).

Flexibility can be differentiated in mix, changeover and modification flexibility (Gerwin, 1993). Mix flexibility results from composing products from a modular set of components (Sanderson & Uzumeri, 1995). Changeover flexibility is achieved by applying existing product designs as development platforms for new product families and models or reusing components across product families and generations (Gerwin, 1993). Modification flexibility is based on altering certain components, while obtaining the overall product architecture and unmodified components (Wheelwright & Sasser, 1989).

2. Cost drivers

Before discussing cost drivers, economies of substitution as a central cost element of modularity need to be described. They occur if “(…) the cost of designing a higher-performance system through the partial retention of existing components is lower than the cost of designing the system afresh” (Garud & Kumaraswamy, 1995, p.

96). Substitution economies differ from economies of scope in terms of its origins. While economies of scope result from using capacities of 'quasi-public' goods, which otherwise would remain unexploited (Kloock & Sabel, 1993), economies of substitution are based on fully separable, autonomous inputs, which are designed to provide variable output capacities. Thus, economies of scope use 'variations of alternative input capacities' for alternative applications, while economies of substitution use 'variations of standardized output capacities' for alternative applications (Kloock & Sabel, 1993). In consequence, scope economies are factor input oriented while substitution economies are factor output oriented. Based on this, positive and negative cost effects as well as risks of modularity are discussed.

For a concept to be 'hybrid', it is obligatory to combine differentiation with positive cost effects. While differentiation is mainly driven by product and service characteristics, costs are impacted by product and organization design. Product oriented cost drivers of modularity are scale and capacity utilization as well as substitution and make or buy decisions.

For manufacturers modular product designs generate economies of substitution in product development, testing and quality assurance per product variant (Sanchez, 1995; Garud & Kumaraswamy, 1995, p. 96). Additionally, combinational learning leads to incremental product innovations and improvements as well as reductions in development, test and quality costs (Kloock & Sabel, 1993). Furthermore, set-up costs are reduced or even avoided for all sustained components (Garud & Kumaraswamy, 1995, p. 96). Continued architectures, interfaces and components lead to a component based increase of economies of scale in production and purchasing (Sanchez, 1996, p. 129). Thus available capacities in manufacturing as well as in marketing and sales can be better utilized. Beyond that, 'delayed differentiation', through adding differentiation relevant components late in the delivery process generate cost advantages in inventory and assembly (Zangwill, 1993; Lee & Billington, 1993; Hau & Tang, 1997). Also modularity's emphasize on architectural level and core components, which are critical to overall product performance and customer perception, generate value chain efficiencies through supporting decisions on make or buy. (Sanchez & Mahoney, 1996, p. 72) Finally, market and competitor imitation risks are reduced by increasing product flexibility and adaptation to customer preferences as well as shorter product development cycles (Sanchez, 1996, p. 129; Baldwin & Clark, 2000).

Organizational cost drivers are often determined by a company's product design choice meaning that modular product manufacturer often structure their organization modularly as well (Sanchez & Mahoney, 1996, p. 131; Worren, Moore, & Cardona, 2002, p. 1126). The major modular organization cost drivers are substitution, strategic adaptability and learning.

By decoupling relatively autonomous units and linking them through pre-specified, standardized

interfaces modular organizations use 'embedded coordination' and substitute overt, managerial authority (Orton & Weick, 1990). Consequently less management capacities are required and coordination and transaction costs decline (Sanchez, 1995, p. 146). The product oriented principle of 'mixing and matching of components' applies also to a modular organization's independent and reusable units. Thus, recombining and reconfiguring independent organizational units generates organizational flexibility and economies of substitution, if change can be located on the level of groups or individual units (Teece, Pisano, & Shuen, 1997, p. 520; Sanchez, 1995, p. 154). Moreover, economies of substitution result from knowledge sharing, compared to knowledge 'hoarding' in traditional hierarchical structures of knowledge (Garud & Kumaraswamy, 1995, p. 98).

Despite the above mentioned positive impacts on cost drivers, modularity produces also negative cost effects, compared to traditional designs. Costs are negatively driven through costs of increased complexity and diseconomies of substitution on both, product and organizational level. Modularity's higher level of variety and complexity increases coordination costs. Lateral integration of 'in-house' produced components and vertical integration of externally supplied components raise management coordination efforts. Additional coordination costs also occur as management's cognitive complexity expands through allocating scarce resources on partly competing activities (Teece D. , 1980). Diseconomies of substitution primarily result from increased development and coordination efforts. Development costs rise because of increased design requirements (Garud & Kumaraswamy, 1995, p. 100). In addition specifying and aligning interfaces between autonomous units and components as well as developing modular architectures including degrees of freedom for future opportunities is relatively costly compared to traditional, integrated designs. Moreover cumulative search and test costs are higher as the total amount of product components and variety rises. (Banker, Datar, & Kemerer, 1993).

Summarizing, modular product and organization design is a necessary, but not sufficient prerequisite for SQHS per se. Rather the net result of the corresponding production and transaction costs of all product lines and variants determine the success of SQHS. This directs the discussion onto a firm's activity system as a concrete manifestation of SQHS generic concept and activity drivers.

B. Determining a SQHS core activities and core resources

Contrary to the relationship of drivers and activities shaped by alignment, activities and resources are bonded by the nature of activities engaging resources for achieving a firm's objectives. Moreover, activities do not simply employ resources; they also can shape existing ones or create new ones. Principally, many activities and resources are similar in traditional and modular design. However some core activities and re-

sources differ, which therefore are emphasized in the following discussion (Hamel, 1994).

SQHSs core primary activities are mainly located in purchasing, operations, outbound logistics and marketing.

In purchasing hybrid core activities relate to make or buy decisions and are based on the capability of identifying core components within product architectures or core units within organizational structures (Garud & Kumaraswamy, 1995, p. 97). This in turn is determined by capabilities in marketing, product design and operations. In marketing the capability rests on real-time market research and competitor and market analysis, while product design provides the basis for modularity and thus variety, and operations capable of providing rapid prototypes (Wheelright & Clark, 1992). With this knowledge firm's identify non-core components or units, evaluate competitors' and suppliers' corresponding performance and decide whether to externally supply or internally produce the components or services. In consequence, the selection of capable partners is one core purchasing activity for SQHS.

In operations core activities are integrating and managing outsourced component and service provision, design product architectures decoupling architecture and technology development, rapidly designing and reusing modular architectures for products and organizations, as well as reusing architectures, interfaces and components. While in purchasing potential partners are evaluated and selected, in operations external partners are operationally integrated and managed in order to meets pre-specified requirements and service levels. Moreover, designing modular product architectures is an essential activity of SQHS. Such architectures contain a complete information structure defining 'required outputs of component development processes before beginning development of components' (Sanchez & Mahoney, 1996, p. 70). While basic knowledge on technology is necessary for designing architectures, technology development typically manifests on component level. Therefore architectural design and basic technology capabilities are a prerequisite of hybrid strategies based on modularity. Similarly strong competencies in technology development on core component level are required. Rapid prototyping as another core activity in R&D founds the basis for real-time market research. Furthermore testing and developing modular architectures and components are core activities in research and development. This requires sufficient upfront investments in complex modular product architectures with costly interface definitions and degrees of freedom for future opportunities. Correspondingly capabilities are required in modular and experimental product design, interface specification and alignment, experimental product design, as well as in search and reuse of knowledge and existing modular product architectures, components or interfaces as well as adaptable organizational units. Similarly to R&D in manufacturing capital investments in production facilities are required to provide the basis for generating sufficient scale economies (Kloock & Sabel, 1993).

This is necessary as the volume increasing effect of differentiation generate the potential of realizing economies of scale if production facilities are sufficiently dimensioned (Kloock & Sabel, 1993). Furthermore, modularity in products and organizations are a necessary but not sufficient prerequisite for generating economies of substitution. Rather substitution effects occur only if components are actually reused in operations (Cusumano, 1991; Banker, Datar, & Kemerer, 1993). Thus the corresponding core activity is stimulating modularity conform employee behavior through applying core resources such as a focused incentive system and IT and communications infrastructure supporting search and coordination activities (Graham, 1994).

The core activity in outbound logistics is delayed differentiation, what is achieved by adding value delivering customer perceived components at late stages of the delivery process (Hau & Tang, 1997). As delayed differentiation components are frequently assembled in warehouses, decentralized assembly capabilities are required.

In marketing and sales core activities are real-time market research and identifying core components determining customer perceived value. Real time market research depends on customer feedback generated on rapid and efficient prototyping based on modular designs. This feedback in turn is used to identify core components by analysing the differential effects of product variants on customers' value perceptions. Accordingly 'threshold, central or plus-only' product attributes can be differentiated with special attention on threshold components (Bogner & Thomas, 1996). In addition, this requires specific analytical capabilities, which are often located in decentralized sales and marketing units generating customer data on product variants from field trials in for example antenna or test shops (Sanchez, 1996, p. 130).

SQHSs core support activities are located in firm infrastructure, HR management and technology.

Core activities within firm infrastructure are constructing organization structures modularly, orchestrating independent, self-managing units, and dynamically reconfiguring and transforming the value chain. Developing loosely coupled organizational subsystems or 'self managing teams' is an essential activity for dynamically adapting the value chain (Worren, Moore, & Cardona, 2002, p. 1126). This requires high degrees of standardization and formalization capabilities for defining interfaces as the basis for embedded coordination (Zander & Kogut, 1995; Zenger & Hesterly, 1997). Also the capabilities of identifying core components and units, partitioning the overall system and coordinating internal and external product and service provision are essential (Garud & Kumaraswamy, 1995; Worren, Moore, & Cardona, 2002, p. 1126). As coordination and partitioning are required repeatedly knowledge sharing and codification are also essential capabilities. Moreover, the decomposition of the value chain requires strong collaboration capabilities in order to coordinate individual units by means of standard input and output defini-

tions (Jarvenpaa & Ives, 1991). Last but not least, deconstructing the value chain in its individual parts and reconfiguring it by using external resources can foster 'resource leverage' as external resources can be used while resources' costs need only partially be carried by the firm (Sanchez, 1995, p. 151; Garud & Kumaraswamy, 1995, p. 102). Thereby SQHS compensate own resource deficits, facilitate knowledge exchange, or align definitions of interfaces beyond company borders (Prahalad & Hamel, 1990). However for achieving this, firm's need to have a distinct combinative capability allowing effective and efficient integration of internal and external resources (Zander & Kogut, 1995). Additionally, sequential strategic enhancement require the management capability of identifying internal or external change requirements, determining the degree of internal change necessary and adapting the value chain accordingly. Especially the last core capability requires the dynamic capability of reconfiguring and transforming a firm's current set of activities and resources. In consequence the focus of strategic management shifts to a ‚higher-order' process of redesigning the firm as a system for rapidly reconfiguring and redeploying a changing array of assets and capabilities (Sanchez, 1996, p. 126).

In HR management core activities of SQHS are reuse and transfer of knowledge, architectures and components as well as employee rotation and development. Next to operative learning through 'real-time market research', knowledge transfer is among the most important activities for developing or improving a firm's reconfiguration and transformation capabilities and achieving economies of substitution (Garud & Kumaraswamy, 1995, p. 98). Knowledge in traditionally structured firms is typically not characterize by change and adaptation; rather it is stable in nature and coined by 'knowledge hoarding' (Garud & Kumaraswamy, 1995, p. 98; Henderson & Clark, 1990, p. 20). Contrary, SQHS are sharing, reusing and developing knowledge by means of employee rotation and development, knowledge documentation and incentives (Garud & Nayyar, 1994). This is mainly based on the capabilities of standardization and formalization and is congruent with Worren et al.'s findings that if 'all teams and departments follow the same basic process architecture, the company achieved more rapid knowledge transfer and rotation of personnel across organizational boundaries' (Worren, Moore, & Cardona, 2002, p. 1127; Garud & Kumaraswamy, 1995). This is additionally supported by the core activity of offering incentives to employees for sharing and documenting knowledge. Therefore, management has to be capable of developing a clear understanding of employees' intrinsic and extrinsic motivation and transferring that knowledge into the firm's incentive system (Cusumano, 1991). Another resource supporting knowledge sharing and reuse is a company's culture fostering collaboration and exchange (Worren, Moore, & Cardona, 2002, p. 1128). In addition a SQHS culture advances employee orientation and thus emphasizes the importance of employees for other capabilities such as reconfiguration and learning (Worren, Moore, & Cardona, 2002, p. 1129; Garud & Kumaraswamy,

1995, p. 99). Also fundamental change willingness needs culturally be embedded reflecting the continuous search for new solutions by using existing and new knowledge (Henderson & Clark, 1990, p. 6). Finally a SQHS core operational and management activities are reflected in a firm's culture by encouraging strong customer, competitor, innovation and technology orientation.

Core activities in technology management are centered on information and communication technology (ITC) supporting learning, reuse and coordination. This is mainly driven by the increased information and communication requirements resulting from SQHS modular variety and its distinct capabilities of standardization, formalization and coordination. Therefore "… information and telecommunications technologies are playing an important new role in linking widely dispersed product creation activities. Establishing effective electronic mediation of processes for developing, manufacturing, distributing, and marketing products requires establishing shared communications interfaces and standardizing descriptions of products, components, parts, and processes" (Sanchez, 1996, p. 132). Consequently hybrid sequential firms have to be capable of evaluating ITC technology in terms of its firm specific applicability and benefit as well as successfully implementing the technology to benefit from it.

In summary, a SQHS core primary activities can be located in operations, explicitly research and development, and on marketing and service. For combining competitive advantages successfully, however, an adequate structure of support activities and corresponding resources and capabilities is required. While principally only few core resources are primary, such as capital requirements, combining competitive advantages rests mainly on a firm's managerial capability of orchestrating operational capabilities in areas such as real-time market research, modular and experimental product development, rapid prototyping, or interface specification. Correspondingly core capabilities are focused on coordination and integration, learning, and reconfiguration and transformation. An overview of a SQHS core activities and capabilities is shown in figure 1.

VI. DISCUSSION AND IMPLICATIONS

A. Summary and conclusion

In this paper it is argued that the gap between generic concepts and a firm's individual resources and capabilities can be closed by activity drivers and activities. At organizational or collective level hybrid generic concepts embed the required knowledge of activity drivers and activities defining the space of alternative positioning. Based on that, the activity system is individualized on firm level. As in research on organizational ambidexterity the prevailing role of management is stressed. However, the importance of management is not seen in managing 'tensions' within a firm's activity system as in management based hybrid strategies. Rather it is argued that success of hybrid strategies is build on consistently applied and implemented concepts principally avoiding tensions within the activity system. Combining competitive advantages consistently

can be either achieved sequentially or concurrently. On that basis, the link between generic concepts and resources provided by the activity based view was theoretically outlined and further detailed for sequential hybrid strategies. Conclusions are drawn from both levels starting with findings from linking concepts, activities and resources and ending with more specific results derived from modularity based sequential hybrid strategies.

Theoretically linking concepts and resources highlighted a general prerequisite of deploying resources through activities as competitive weapons in the market place. This shifts analysis emphasis from a resource to an activity systems level orchestrating resource engagements. Then a firm's stock of resources is a necessary but not sufficient condition for combining competitive advantages. Rather it is crucial to determine how a firm engages its resources from an activity based perspective. Furthermore the activity based view bridges the gap between concepts and resources by cascading activity drivers from generic concepts and then composing activity systems orchestrating the engagement of (groups of) resources through activities. In consequence it is concluded that there is not such a thing as hybrid resources, but activities elaborating resources and thus impacting several activity drivers influencing multiple competitive advantages concurrently. The hybrid effect of activities occurs on an individual activity as well as on an activity systems level. This means on individual level a single activity impacts multiple drivers, while on collective level the sum of all activities develops hybrid effects. In both cases, however, the hybrid effect requires a firm's activity system to be consistently aligned avoiding contradictions potentially offsetting each other.

For hybrid strategies two types are identified satisfying this consistency prerequisite: Sequential and concurrent hybrid strategies. For practical reasons of limiting the scope of this paper only sequential hybrid strategies were further detailed. System theoretically derived modularity principles provide the foundation for sequential hybrid strategies. As exemplified with SQHS, activities and resources of generic and hybrid strategies differ only in a few core operational functions. However, firm's applying hybrid strategies need to excel in these, while potentially externalize non-core activities and components. In addition, operational core activities and resources are not sufficient to perform hybrid. Rather a firm's support activities and resources, especially its infrastructure, management capabilities, technology base and culture are essential in consistently aligning operational activities for achieving hybrid competitive advantages. In this sense, management's core tasks are identifying generic concepts applicable to the firm and its specific context and acquiring or creating, as well as arranging and applying its stock of resources within the activity system.

In summary, two major pillars of academic discussions on hybrid strategies need to be revised. Both related to operationalisation. First, success of hybrid strategies can neither be determined on

generic concept nor on resource level. Generic concepts represent industry wide available knowledge and are often used as the starting point for developing a strategy. However, similarly to Mintzberg's distinction of intended and emergent strategy patterns, generic concepts are valuable only if they 'emerge' within a firm's activity system (Mintzberg, 1978). This means in turn, that despite the key role of management in implementing hybrid concepts it is crucial to consider the level of strategic realization on operational level. Otherwise researchers risk analysing management's strategic intentions without testing its realization within a firm's activity system. Second, operationalising the link between concepts and resources requires three layers. First, generic and structural activity drivers define the space of alternative positioning and thus determine the underlying logic of competitive advantages. The second layer, the activity system, is mainly responsible for consistently orchestrating the overall set of activities on multiple competitive advantages. Individual activities as the last layer engage resources and capabilities in order to positively affect competitive advantages. In consequence, lacking one or more of the above operationalisation layers can distort research results on hybrid strategies by leaving a blind spot on implementation effectiveness.

B. Limitations and future research

The focus of this paper was on strengthening the theoretical foundation of hybrid strategies by reviewing the literature and constructing a consistent concept of hybrid strategies. Based on market based, activity based and resource based views a consistent concept of hybrid strategies was developed and the corresponding strategic implications, structures, activities and resources provided. Accordingly, the next stage is to apply these findings in an empirical study testing the above made hypotheses. For this, a triangulated pattern matching case based approach comparing theory with empirical results seems most appropriate.

Additionally future research should investigate the influence of intended versus realized strategy patterns implemented within an activity system. This could illuminate the importance of a firm's management as well as its implementation effectiveness and efficiency. Furthermore, theoretical and empirical investigations are required determining SQHS capabilities necessary for identifying the requirements, time and degree of strategic enhancements. In this respect especially the hypothesized key role of management needs to be tested. Operational fit between hybrid concepts and activity drivers on the one side and hybrid activities and resources on the other side depends on a variety of factors such as differences in firm specific context, diversity in resources and capabilities, discrepancy between a management's perception of a firm's current activities and resources and its transformation capability. Additional research on this is necessary to clarify the relationship, direction and intensity of those factors' on implementing hy-

brid strategies. Furthermore the relationship between generic concepts, activity drivers and activities as well as resources and capabilities is fruitful for further investigation. While in this paper activity based insights were applied to strategy operationalisation it also could be applied to topics such as strategy formulation and implementation. Last but not least, the focus of this paper is limited to exemplify sequential hybrid strategies. Concurrent hybrid strategies provide further potential for future theoretical and empirical research. This is of particular importance as the theoretical fundament differs between both consistent hybrid strategies and consequently SHQS's basis cannot simply be transferred to concurrent hybrid strategies.

FIGURE 1: OVERVIEW ON HYBRID STRATEGY TYPES

Hybrid strategy type	Variants	Description	Theoretical grounding	Evaluation	
				Consistency	Sustainability
Management based hybrid strategy	Management based	Inevitable tensions between activities directed to multiple competitive advantages need to be balanced	Organizations theory	Inconsistent, as strategic conflicts to be managed	Emphasis on management capabilities and organizational design
Sequential hybrid strategy	Sequential	Sequentially enhance competitive advantages	System design	Consistent, no strategic conflicts occur through modular structures	Emphasis on operational and management capabilities required to implement strategic change
Concurrent hybrid strategy	Variety Quality Innovation	Concurrently achieve multiple competitive advantages	Microeconomic principles	Consistent, applying concepts avoiding strategic conflicts	Emphasis on operational and management capabilities required to implement microeconomic concepts

FIGURE 2: GENERIC CONCEPT, ACTIVITY DRIVERS, ACTIVITIES AND RESOURCES

		Generic concept	Drivers	Systems and activities	Core resources and capabilities
POSITIVE COST EFFECTS	Modular product and service design	1. Increase customer perceived product variety and adaptability through mixing and matching of components within existing architectures	- Variety - Flexibility - Timing - Innovation	**I.1. Firm infrastructure** - Dynamically **reconfiguring and transforming** the value chain - **Constructing** processes and structures modularly - **Flat hierarchies and self-managed, independent units** coordinated by embedded coordination - Market driven, **dynamic partner network management** **I.2. HR management** - **Incentive based reuse and transfer of knowledge**, architecture and components - **Employee rotation and development** **I.3. Technology** - **Learning, reuse and coordination supporting** technology infrastructure **I.4. Purchasing** - **Vendor selection** for non-core components and services **II.1. Inbound logistics** - **II.2. Operations** - **Designing modular product architecture** - **Technology** development coupled on component and decoupled on architecture level - **Reusing** product architectures, interfaces, components and structural units - **Selective outsourcing of non-core business** **II.3. Outbound logistics** - **Decentralised, late assembly** of core components **II.4. Marketing and sales** - **Real time market research** through customer feedback on basis of rapid prototyping - **Identification of customer perceived, core components** **II.5 Service** -	**Operational resources and capabilities** - Sufficient **investments in manufacturing** hardware - Upfront **investment in modular architecture** - **Modular design capability** - **Research capability** on customers, competitors and suppliers - **Experimental product development capabilities** - Component oriented **customer value analytic** capability - **Product interface specification and alignment** capability - **Organizational and individual learning** by using, doing and experimenting **Management capabilities** - Management capability of **identifying change requirements and required strategy adaptation** as well as **firm specific adaption** of generic concepts - Business architectural (re-)**configuration and transformation** capability - **Standardization, formalization and codification capability** - **Capability of decomposing** processes and functions - **Structural interface specification and alignment** capability - **Partner evaluation, selection, integration and management** capability - Capability to **manage network oriented structures** combining and assimilating internal and external resources - **Evaluation and implementation** capability of **ITC technology** - **Understanding employee motivators** and transfer to incentive system **Company culture** - Culture **fostering collaboration and exchange** - Culture of **employee orientation and change willingness**
	Modular organization design	2. Value chain efficiency through reusing components across product variants, families and generations	- Scale - Capacity utilization		
		3. Manufacturing efficiencies through leveraging existing architectures, interfaces and components across product variants, families and generations	- Substitution		
		4. Value chain efficiency through emphasizing architectural level and core components, critical to overall product performance and customer perception	- Make or buy		
		5. Substitution of overt managerial authority through embedding coordination in standard interfaces between decentralized units	- Substitution		
		6. Organizational adaptability through reconfiguring the activity system, activities and underlying portfolio of resources and capabilities	- Substitution		
		7. Improve learning through reuse and transfer of knowledge across, divisions, functions and processes	- Learning		

REFERENCES

Abell, D. F. (1980). Defining the business: The starting point of strategic planning. Englewood Cliffs.

Acquaah, M., & Yasai-Ardekani, M. (2008). Does the implementation of a combination competitive strategy yield incremental performance benefits? A new perspective from a transition economy in Sub-Saharan Africa. *Journal of Business Research Vol. 61* , 346–354.

Adner, R., & Zemsky, P. A. (2006). A demand-based perspective on sustainable competitive advatnage. *Strategic Management Journal, Vol. 27* , 215-239.

Allen, R. p., & Helms, M. M. (2006). Linking strategic practices and organizational performance to Porter's generic strategies. *Business Process Management* , 433-454.

Ashby, W. R. (1956). *An Introduction to Cybernetics.* New York.

Bain, J. (1956). *Barriers to New Competition.* Cambridge .

Bain, J. (1968). *Industrial Organisation (2nd edition).* New York.

Baldwin, C. Y., & Clark, K. B. (2000). *Design Rules: The power of modularity.* Boston, MA.

Banker, R. D., Datar, p. M., & Kemerer, C. F. (1993). Software complexity and maintenance costs. *Communications of the ACM* , 81-94.

Barney, J. B. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Marketing, Vol. 1* , 99-120.

Barney, J. B. (1986). Strategic Factor Markets: Expectations, Luck and Business Strategy. *Mangement Science, Vol. 32, No. 10* , 1231-1241.

Barney, J. B. (1986). Types of Competition and the Theory of Strategy: Toward an Integrative Framework. *Academy of Management Review* , 791-800.

Bharadwaj, p. G., Varadarajan, P. R., & Fahy, J. (1993). Sustainable competitive advantage in service industries: A conceptual model and research proposition. *Journal of Marketing, Vol. 57* , 83-99.

Black, J. A., & Boal, K. .. (1995). Strategic resources: Traits, configurations and paths to sustainable competitive advantage. *Strategic Managemetn Journal, Vol. 15* , 131-148.

Bock, W. J. (1973). Philosophical foundations of classical evolutionary classification. *Systematic Zoology* , 375-392.

Bohn, A. (1993). *Differenzierungsstrategien – Kritische Würdigung eines zentralen Konzeptes der strategischen Unternehmensführung.* München.

Bongartz, U. (1997). Strategische Ressourcen und erhaltbare Wettbewerbsvorteile. *Zeitschrift für Betriebswirtschaft, Ergänzungsheft 1/97* , 21-43.

Booth, M. E., & Philip, G. (1998). Technology, competencies, and competitiveness: The case for reconfigurable and flexible strategies. *Journal of Business Research, Vol. 41* , 29-40.

Bresnahan, T. F. (1989). Empirical Studies of Industries with Market Power. In R. Schmalensee, & R. D. Willig, *Handbook of Industrial Organization, Volume 2* (pp. 1011-1057). Amsterdam.

Bühner, R. (1977). Messung des Erfolgs von Organisationen unter Berücksichtigung situativer Einflußfaktoren. *Management International Review, Vol. 17, No. 3* , 51-59.

Buzzel, R., Gale, B. T., & Sultan, R. (1975). Market Share: A Key to Profitability. *Harvard Business Reviews, Vol. 53, No.1* .

Campbell-Hunt, C. (2000). What Have We Learned About Generic Competitive Strategy? A Meta-Analysis. *Strategic Management Journal, No. 21* , 127-154.

Chamberlin, E. (1933). *The Theory of Monopolistic Competition.* Cambridge.

Chrisman, J. J., Hofer, C. W., & Boulton, W. R. (1988). Toward a System for Classifying Business Strategies. *Toward a System for Classifying Business Strategies, in: Academy of Management Review* , 413-428.

Claver-Cortés, E., Pertusa-Ortega, E. M., & Molina-Azorín, J. F. (2011). Characteristics of organizational structure relating to hybrid competitive strategy: Implications for performance. *Journal of Business Research* , doi:10.1016/j.jbusres.2011.04.012.

Connor, T. (1999). Customer-led and market-oriented: a matter of balance. *Strategic Management Journal 20* , 1157-1163.

Cusumano, M. (1991). *Japan's software factories: A challenge to US management.* New York.

Davenport, T. (2005). The coming commoditization of processes. *Harvard Business Review, Vol. 74* , 100-108.

Dess, G. G., & Rasheed, A. M. (1992). Commentary: Generic strategies: classification, combination and context (D. Miller). *Advances in Strategic Management* , 409-416.

Dess, G. G., & Robinson, R. (1984). Measuring Organzational Performance in the Absence of Objective Measures: The Case of the Privately-held Firma and Conglomerate Business Unit. *Strategic Management Journal, Vol.5* , 265-273.

Dickson, P. R., & Ginter, J. L. (1987). Market Segmentation, Product Differentiation, and Marketing Strategy. *Journal of Management, Vol. 4* , 1-10.

Dierickx, I., & Cool, K. (1989). Asset Stock Accumulation and Sustainability of Competitive Advantage. *Management Science* , 1504-1511.

Dunst, K. H. (1983). *Portfolio-Mangement – Konzeption für die strategische Unternehmensplanung, 2. Auflage.* Berlin.

Einav, L., & Levin, J. (2010). Empirical Industrial Organization: A Progress Report. *Journal of Economic Perspectives, Vol. 24, No. 2* , 145-162.

Einav, L., & Levin, J. (2009). *Industrial Organization: A Progress Report.*

Etzioni, A. (1964). *Modern Organizations.* New Jersey.

Fleck, A. (1994). *Hybride Wettbewerbsstrategien: Zur Synthese von Kosten- und Differenzierungsvorteilen.* Wiesbaden.

Gaitanides, M. (1995). Führungsorganisation. In H. Corsten, & M. Reiss, *Handbuch Unternehmungsführung* (pp. 419-431). Wiesbaden.

Garud, R., & Kumaraswamy, A. (1995). Technological and organizational designs for realizing economies of substitution. *Strategic Management Journal* , 93-109.

Gerwin, D. (1993). Manufacturing Flexibility: A Strategic Perspective. *Management Science,Vol. 39* , 395-410.

Ghemawat, P. (2006). *Strategy and the Business Landscape.* Upper Saddle River, NJ.

Gibson, B. C., & Birkinshaw, J. (2006). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal, Vol. 47* , 209-226.

Gilbert, X., & Strebel, P. (1985). Outpacing Strategies. *IMEDE – Perspectives for Managers, No. 2* .

Ginsberg, A. (1994). Minding the competition: From mapping to mastery. *Strategic Management Journal, Vol. 15* , 153-174.

Gupta, A. K., Smith, K. G., & Shalley, C. E. (2006). The interplay between exploration and exploitation. *Academy of Management Journal, Vol. 49, No. 4* , 693-706.

Haedrich, G., Gussek, F., & Tomczak, T. (1989). Differenzierte Marktbearbeitung und Markterfolg im Reiseveranstaltermarkt der Bundesrepublik Deutschland. *Marketing ZFP, No.1, 1989* , 11-19.

Hall, R. H. (1982). *Organizations, Structure and Process.* Englewood Cliffs.

Hall, K.H. (1980), Survival strategies in a hostile environment, in: Harvard Business Manager, No. 5, 1980, S.75-85

Hambrick, D. C., & Lei, D. (1984). Towards an Empirical Priorization of Contingency Variables for Business Strategy. *Academy of Management Journal, Vol. 10* , 687-707.

Hamel, G. (1994). The Concept of Core Competence. In G. Hamel, & A. Heenev, *Competence Based Competition* (pp. 11-33). Chichester.

Henderson, K. R. (1979). *Henderson on Corporate Strategy.* New York.

Henderson, R. M., & Clark, K. B. (1990). Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Administrative Science Quarterly, Vol. 35* , 9-30.

Hinterhuber, H. M. (1980). *Strategische Unternehmensführung, 2. Auflage.* Berlin, New York.

Hofer, C. W., & Schendel, D. (1978). *Strategy Formulation: Analytical Concept.* St. Paul: MN: West.

Hunt, M. (1972). *Competition in the Mafor Home Appliance Industry.* Cambridge.

Jenner, T. (1999). *Determinanten des Unternehmenserfolges,.* Stuttgart.

Jiao, J., Ma, Q., & Tseng, M. M. (2003). Towards high value-added products and services: mass customization and beyond. *Technovation, Vol. 23* , 809–821.

Kirsch, W., & Obring, K. (1991). *Beiträge zum Management strategischer Programme, Rahmenkonzepte und Programme.* München.

Karnani, A. (1984), Generic Competitive Strategies – An Analytical Approach, in: Strategic Management Journal,No. 5, 1984, S. 367-380

Kloock, J., & Sabel, H. (1993). Economies und Savings als grundlegende Konzepte der Erfahrung – Was bringt mehr? *Zeitschrift für Betriebswirtschaft, 63. Jg.* , 209-233.

Knyphausen, D. z., & Ringlstetter, M. (1991). Wettbewerbsumfeld, Hybride Strategien und Econoies of Scope. In W. Kirsch, *Beiträge zum Management strategischer Programme* (pp. 539-557). Herrsching.

Kotha, p., & Orne, D. (1989). Generic Manufacturing Strategies: A Conceptual Synthesis. *Strategic Management Journal 1989* , 211-231.

Leana, C. R., & Barry, B. (2000). Stability and change as simultaneous experiences in organizational life. *The Academy of Management Review, Vol. 25* , 753-759 .

Lee, H. L., & Billington, C. (1993). Material management in decentralized supply chains. *Operations Research* , 835-847.

Link, J. (1985). *Organisation der strategischen Planung.* Heidelberg/Wien.

Mahoney, J. T., & Pandian, J. R. (1992). The Resource-Based View Within the Conversation of Strategic Management. *Strategic Mangement Journal, Vol. 13* , 363-380.

Mahr, F. (2010). *Hybrid Strategy and Firm Performance: The moderating role of Individual and Technological Ambidexterity.* Munich.

Makadok, R. (2001). "Toward a synthesis of the resource-based and dynamic-capability views of rent creation". *Strategic Management Journal, Vol. 22 No. 5* .

Mansfield, R. (1986). *Company Strategy and Organizational Change.* London.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, Vol. 2* , 71-87.

Mason, E. (1939). Price and production policies of large scale enterprise. *American Economic Review, No. 29* , 61-74.

McKee, D. O., Varadarajan, P. R., & Pride, W. M. (1989). Strategic adaptability and firm performance: a market-contingent perspective. *Journal of Marketing, Vol. 53* , 21-35.

Miles, R. E., & Snow, C. C. (1978). *Organizational Strategy, Structure, and Process.* New York: McGraw-Hill.

Miles, R. H. (1980). *Macro Organizational Behavior.* Genview.

Miller, A., & Dess, G. G. (1993). Assessing Porter's (1980) Model in terms of its generalizability, accuracy and simplicity. *Journal of Management Studies, Vol. 30, No. 4* , 553-586.

Mintzberg, H. (1978). Patterns in strategy formation. *Management Science, Vol. 24* , 934-949.

Mintzberg, H., Ahlstrand, B., & Lampel, J. (1999). *Strategy Safari: A Guided Tour Through the Wilds of Strategic Management.* Vienna.

Morschetta, D., Swobodab, B., & Schramm-Klein, H. (2006). Competitive strategies in retailing—an investigation of the applicability of Porter's framework for food retailers. *Journal of Retailing and Consumer Services, Vol. 13* , 275-287.

Nobeoka, K., & Cusumano, M. A. (1997). Multiproject strategy and sales growth: the benefits of rapid design transfer in new product development: The benefits of rapid design transfer in new prodcut development. *Strategic Management Journal* , 169-186.

Orton, J. D., & Weick, K. E. (1990). Loosely Coupled Systems: A Reconceptualization. *Academy of Management Journal* , 203-223.

Parnell, J. (1997). New Evidence in the Generic Strategy and Business Performance Debate: A Research Note. *British Journal of Management, Vol. 8,* , 175–181.

Parnell, J. (1998). Performance's influence on strategic change: A longitudinal assessment. *Scandinavian Journal of Management, Vol. 14* , 19-36.

Pearce, J. A., & Robinson, R. B. (2005). *Formulation, Implmentation, and Control of Competitive Strategy.* Boston, MA.

Penrose, E. T. (1959). *The theory of the growth of the firm.* New York.

Pertusa-Ortega, E. M., Molina-Azurin, J. F., & Claver-Cortés, E. (2009). Competitive Strategies and Firm a Comparative Analysis of Pure, Hybrid and 'Stuck-in-the-middle' Strategies in Spanish Firms. *British Journal of Management, Vol. 20, No. 4* , 508-523.

Peteraf, M. (1993). The Cornerstones of Competitive Advantage: A Resource-Based View. *Strategic Management Journal, Vol. 14* , 179-191.

Porter, M. E. (1980). *Competitive Strategy.* New York.

Porter, M. E. (1985). How Information Gives You Competitive Advantage. *Harvard Business Manager, July-August* .

Porter, M. E. (1981). The Contributions of Industrial Organization to Strategic Management. *Academy of Management Review, Vol. 6, No.4* , 609-620.

Porter, M. E. (1979). The Structure within Industries and Companies' Performance. *Review of Economics and Statistics, Vol. 61* , 214-227.

Porter, M. E. (1991). Towards a Dynamic Theory of Strategy. *Strategic Management Journal, Vol. 12* , 95-117.

Prahalad, C. K., & Hamel, G. (1990). The Core Competence of the Corporation. *Harvard Business Review, No. 3* , 79-91.

Proff, H. (2000). Hybrid strategies as a strategic challenge — the case of the German automotive industry. *Omega, Vol. 28, No. 5* , 541-553.

Proff, H., & Proff, H. V. (1997). Möglichkeiten und Grenzen hybrider Strategien. *Die Betriebswirtschaft, No. 6* , 796-809.

Raisch, p., & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes, and moderators. *Journal of Management, Vol. 34, No. 3* , 375-409.

Ray, G., Barney, J., & Muhanna, W. (2004). Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical tests of the resource-based view. *Strategic Management Journal, Vol. 25 No. 1* , 23-38.

Rumelt, R. P., Schendel, D., & Teece, D. J. (1991). Strategic Management and Economics. *Strategic Management Journal, Vol. 12* , 5-29.

Sanchez, R. (1995). Strategic flexibility in product competition. *Strategic Management Journal, Vol. 16* , 135-159.

Sanchez, R. (1996). Strategic product creation: Managing new interactions of technology, markets, and organizations. *European Management Journal, Vol. 14* , 121-138.

Sanchez, R., & Mahoney, J. (1996). Modularity, flexibility, and knowledge management in product and organization desig. *Strategic Management Journal, Vol. 17* , 63-76.

Sanchez, R., & Sudharshan, D. (1993). Real-time market research. *Marketing Intelligence & Planning* , 29-38.

Sanderson, p., & Uzumeri, M. (1995). Managing product families: The case of the Sony Walkman. *Research Policy* , 761-782.

Saunders, M., Philip, L., & Thornhill, A. (2009). *Research methods for busniness students.* Essex: Pearson Education Limited.

Schanz, G. (1982). *Organisationsgestaltung: Struktur und Verhalten.* München.

Schertler, W. (1995). *Unternehmensorganisation, 6. durchgesehene Auflage.* München.

Schilling, M. A. (2000). Toward a general modular systems theory and its application to interfirm product modularity. *The Academy of Management Journal* , 312-334.

Schmalensee, R. (1989). Inter Industry Studies of Structure and Performance. In R. 1. Schmalensee, & R. D. Willig, *In Handbook of Industrial Organization, vol. 2* (pp. 951-1010). Amsterdam: North Holland.

Seashore, p. E. (1983). A Framework for an Integrated Model of Organizational Effectiveness, Organizational Effectiveness: A Comparison of Multiple Models. In K. p. Cameron, & D. A. Whetten. New York.

Selznick, P. (1957). *Leadership in Administration.* New York.

Sheehan, N., & Foss, N. (2007). Enhancing the prescriptiveness of the resource-based view through Porterian activity analysis. *Management Decision Vol. 45, No. 3* , 450-461.

Simon, H. A. (1991). Bounded rationality and organizational learning. *Organization Science, Vol. 2* , 125-134.

Simsek, Z., Heavey, C., Veiga, J. F., & Souder, D. (2009). A typology for aligning organizational ambidexterity's conceptualizations, antecedents, and outcomes. *Journal of Management Studies, Vol. 46, No. 5* , 864-894.

Snow, C. C., & Hrebiniak, L. G. (1980). Strategy, distinctive competence, and organizational performance. *Administrative Science Quarterly, Vol. 25* , 317-336.

Spanos, Y. E., Zaralis, G., & Spyros, L. (2004). Strategy and industry effects on profitability: Evidence from greece. *Strategic Management Journal, Vol. 25* , 139-165.

Spender, J. C. (1994). Organizational knowledge, collective practice, and Penrose rents. *International Business Review, Vol. 3* , 353-367.

Staehle, W. H., & Grabatin, G. (1979). Effizienz von Organisationen. *Die Betriebswirtschaft, 39. Jg., No 1b* , 89-102.

Stalk, G. E., & Shulman, L. (1992). Competing on capabilities: the new rules of corporate strategy. *Harvard Business Review, Vol. 70, No.2* , 57-69.

Stalk, G., Evans, P., & Shulman, L. (1992). Competing on capabilities: the new rules of corporate strategy. *Harvard Business Review, Vol. 70, No.2* , 57-69.

Teece, D. (1980). Economies of Scope and the Cope of the Enterprise. *Journal of Economic Behavior and Organization, Vol. 1* , 223-247.

Teece, D. J. (2009). *Dynamic Capabilities and Strategic Management: Organizing for Innovation and Growth.* Oxford.

Teece, D., Pisano, G., & Shuen, A. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal, Vol. 18, No. 7* , 509-533.

Venkatraman, N., & Camillus, J. (1984). Exploring the concept of fit in strategic management. *Academy of Management Review, No. 9* , 513-525.

Wernerfelt, B. (1984). A Resource-Based View of the Firm: Ten Years After. *Strategic Management Journal, Vol. 16, No.2* , 171-180.

Wheelwright, p. C., & Sasser, W. E. (1989). New product development map. *Harvard Business Review* , 112-125.

Withney, J. O. (1996). Strategic Renewal for Business Units. *Harvard Business Manager, July-August* , 84-89.

Worren, N., Moore, K., & Cardona, P. (2002). Modularity, strategic flexibility, and firm performance: A study of the home appliance industry. *Strategic Management Journal* , 123–1140.

Wright, P., Kroll, M., Pringle, C., & Johnson, J. (1990). Organization Types, Conduct, Profitability and Risk in the Semiconductor Industry. *Journal of Management Systems 2(2)* , 33–48.

Wright, P., Kroll, M., Tu, H., & Helms, M. (1991). Generic Strategies and Business Performance: An Empirical Study of the Screw Machine Products Industry. *British Journal of Management* , 57-65.

Zajac, E. J., & Shortell, p. M. (1989). Changing Generic Strategies: Likelihood, Direction, and Performance Implications. *Strategic Management Journal, Vol.10* , 413-430.

Zangwill, W. I. (1993). *Lightning Strategies for Innovation.* Lexington.

Zott, C., & Amit, R. (2010). Business Modell Design: An activity system perspective. *Long Range Planning, Vol. 43* , 216-22

APPENDIX 6: PUBLICATION 2

13th Annual Conference of the European Academy of Management (EURAM) 2013 – Democratizing Management

„ Hybrid competitive strategies and the activity based view of strategy: A literature review"

MICHAEL ZELLNER AND LYNNE BUTEL
UNIVERSITY OF PLYMOUTH, PLYMOUTH, UK

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HYBRID COMPETITIVE STRATEGIES AND THE ACTIVITY BASED VIEW OF STRATEGY: A LITERATURE REVIEW

MICHAEL ZELLNER AND LYNNE BUTEL

UNIVERSITY OF PLYMOUTH, PLYMOUTH, UK

Abstract *- We take a step beyond the current discussion on hybrid competitive strategies by introducing the activity based view of strategy. For the empirical and theoretical literature analysis, three types of hybrid strategies are classified according to varying consistency and sustainability characteristics. For each type underlying concepts are described. By including the activity based view of strategy in the discussion on hybrid strategies, a new level of analysis, allowing for generating further understanding of the underlying mechanisms of hybrid strategies is introduced. However, our findings show that, especially in empirical research on hybrid strategies, the activity based view of strategy is not considered, despite theoretical works strongly focusing on a firm's activity system as the level of analysis explaining how firms combine multiple competitive advantages. Thus, we suggest substantial future research potential at the intersection of hybrid strategies and the activity based view of strategy.*

Keywords: Hybrid strategy, activity-based view

I. Introduction

Hybrid competitive strategies (HS) are compelling as they allow for generating higher rents by combining several competitive advantages simultaneously. Also they are less vulnerable to changes compared to pure or no emphasis strategies as they better address customer needs, are difficult to imitate, and generate a flexible and wide view (Pertusa-Ortega, Molina-Azurin, & Claver-Cortés, 2009). The current body of research on what is termed 'combination', 'simultaneous', 'mixed', 'ambidextrous', or 'hybrid' strategies is comprehensive (Fleck, 1994; Mahr, 2010; Parnell, 1997), however founded on theoretically and empirically ambiguous results. This is especially disappointing as hybrid strategies are potentially fruitful in volatile and dynamic environments most companies are facing today (Proff, 2000).

Lines of reasoning for this ambiguity are threefold. The first line focuses on covering the full scope of strategic variety, while the second regards varying measures of strategic success, and the third highlights operationalisation issues. Many existing strategy typologies cover the scope of strategic variety incompletely or partially by not considering combinations of competitive advantages (Dess & Rash-

eed, 1992; Wright, Kroll, Tu, & Helms, 1991). Further, strategic targets vary among strategy schools and thus may bias comparability of empirical research. Examples of different targets are company performance, market share, or scope and differentiation targets (Porter, 1991; Buzzel, Gale, & Sultan, 1975; Abell, 1980). Correspondingly, empirical results on hybrid strategies range on a continuum from 'prove of vitality' to 'below average performance'. In addition to different performance measures, studies also vary according to different comparison groups. Examples are studies measuring against all companies within an industry sample or comparing only individual strategy groups with one another (Mahr, 2010). Beyond that, some research on hybrid strategy assesses strategic orientations by subjective assessments of bundles or individual indicators of a company's resources and capabilities. These approaches, besides suffering the frequent shortcomings of subjective measurement approaches, are potentially biased, as it remains unclear whether intended or measurable, emergent strategy patterns are observed (Mintzberg, Ahlstrand, & Lampel, 1999). Last but not least, the few research examining operational concepts, activity systems, and resources and capabilities of hybrid strategies is limited and fractional. Currently no theoretical or empirical research is available on linking generic concepts with individual levels of resources and capabilities in the context of hybrid strategies. This paper aims at extending the research on HS by enhancing the discussion through the activity-based view (ABV) allowing for identifying future research potential. The article is structured as follows. First, the development of the field of strategic management is presented. Second, an overview on HS and its underlying concepts is provided, before third, the ABV is introduced. Fourth, the empirical and theoretical literature on HS is analysed founding the basis for, five, determining future research issues.

II. Development of the field of strategic management research

From its beginnings in the 1950's strategic management was characterized by a practice orientation with a strong focus on business concepts affecting firm performance. Accordingly, the evolution of strategic management research was driven more by finding answers to practical needs of businesses than by developing a consistent theory. For a detailed analysis of the field's development, see Hoskisson et al. (Hoskisson, Hitt, Wan, & Yiu, 1999). In general, the field's development oscillated around an internal and external perspective with having its roots on the internal view of competitive resources

(Barnard, 1938; Penrose, 1959). Methodologies used at that time were mainly inductive and case based. Generalizations were seen to be impossible because of the nature and number of strategic variables and the problems associated with classifying them (Christensen, Andrews, Bower, & Learned, 1969). In this sense business policy studies merely provided a familiarity with an approach to business problems, and in symbiosis with detailed resource analysis, firm's were able to combine these variables into a pattern valid for one organization (Christensen, Andrews, Bower, & Learned, 1969). This normative and prescriptive methodology caused several problems such as a weak theoretical underpinning, which made it impossible for researchers to theoretically derive and empirically test hypotheses (Hoskisson, Hitt, Wan, & Yiu, 1999). In consequence, research results were anecdotal with low scientific rigor. Additionally, missing generalizations and a restricted use of quantitative methods prevented the field's researchers from progressing both theoretically and empirically. These reasons initiated a first change to the other extreme, the external perspective, in which the research discussion centred on the structure-conduct-performance (SCP) paradigm assuming that a firm's performance is primarily a function of the industry structure (Bain, 1968). In this paradigm, business strategy is mainly concerned with how attractive an industry is and how firms cope with industry structure and change it to their favour (Porter, 1980). Rooted primarily in economic theory methods applied ranged from inductive, qualitative to deductive, quantitative analyses. While dominating large parts of the research field in the 1980's, scientific dispute occurred based on SCP's limited focus on industry characteristics. Therefore, as evidence increased that interfirm heterogeneity explains performance differences a move back to the internal perspective occurred (Rumelt, 1991). Starting with organizational economics (OE), a subfield of economics, a firm's inner structural logic and functioning was untangled (Hoskisson, Hitt, Wan, & Yiu, 1999). The most prominent and in strategic management widely dispersed theories of OE are transaction cost and agency theory (Coase, 1937; Williamson, 1979; Alchian & Demsetz, 1972). However, as the pendulum swung back to the firm level, the above-mentioned problems – especially the measurement problem – remained unsolved (Godfrey & Hill, 1995; Hoskisson, Hitt, Wan, & Yiu, 1999). For that reason, empirical researchers on OE were required to rely on more speculative theory and indirect research mechanisms such as ownership structure and executive compensation (Hoskisson & Hitt, 1990). New and sophisticated research methods, such as structural equation modelling, were applied to strategic management at that stage (Hoskisson, John-

son, & Moesel, 1994; Hitt, Hoskisson, Johnson, & Moesel, 1996). While OE turned strategic management's perspective to the inner structural logic and functioning of firms, the resource based view of the firm (RBV) was deepening the focus by considering idiosyncratic resources and capabilities as the sources of competitive advantage (Barney, 1991). In this sense, RBV seeks to understand 'why firms are different' and 'how competitive advantages are achieved and sustained on firm level'. In RBV sustainable competitive advantage results from 'isolating barriers' (Rumelt, 1984) centring around heterogeneous strategic resources. The term 'strategic' implies a resource's potential to generate sustainable economic rent by its limited strategic substitutability by equivalent resources and time compression diseconomies for firms trying to imitate them (Dierickx & Cool, 1989). Most of the early research on RBV focused on investigating the performance impact of specific resources, such as for example organizational culture, organizational learning, entrepreneurship, human resources, or a firm's resource orientation (Barney, 1986; Teece, Pisano, & Shuen, 1997; Nelson, 1991; Amit & Schoemaker, 1993; Chmielewski & Paladino, 2007). In a further advancement, the focus shifted from the analysis of individual resources to the performance implications of combinations of resources and capabilities (Makadok, 2001; Chmielewski & Paladino, 2007). This shift fostered the application of research philosophies such as subjectivism, constructivism and critical realism and reintroduced inductive, case-based research methods in addition to deductive, large-sample methods (Hoskisson & Hitt, 1990).

III. Hybrid competitive strategies

Constituting characteristic of hybrid strategies is the pursuit of multiple competitive weapons in the market place based on several competitive advantages achieved simultaneously (Proff & Proff, 1997). Discussions on HS typically arise from concepts of generic strategies according to which firms attain competitive advantages from either achieving a favourable position within an industry altering the industry structure in their favor or from owning rare, valuable, inimitable and non-substitutable strategic resources. (Mahr, 2010; Parnell, 1997). Despite differences, almost all strategy typologies share two commonalities founding the basis for outperforming competitors: Internal consistency and external sustainability (Fleck, 1994). While for HS the system based consistency principle is of special importance as it requires strategies to be constructed and implemented without system immanent con-

flicts the sustainability principle applies to both, pure and hybrid competitors, but to a varying extent (Acquaah & Yasai-Ardekani, 2008, p. 353).

For discussing strategic contradictions and their emergence, the unit of analysis is crucial (Gupta, Smith, & Shalley, 2006, p. 694). Potential units of analysis are organizations as a whole, a firm's activity system or its decomposed parts, as well as bundles of or individual resources and capabilities. Depending on the unit of analysis, conflicts caused by HS can either be accepted and trade-offs made, be attenuated by managing tensions or completely avoided by applying consistent concepts (Simsek, Heavey, Veiga, & Souder, 2009, S. 868; Fleck, 1994; Porter, 1980).

Research on March's exploration and exploitation strategies exemplifies parts of this development. Early research often claimed that combining different competitive advantages is impossible, meaning that a firm's activity system can either be consistently aligned to exploration or exploitation (March, 1991; Gupta, Smith, & Shalley, 2006). In this case, the corresponding level of analysis is the organization as a whole. Contrary, recent research on 'organizational ambidexterity' (OA), turned to the thinking of balancing tensions of seemingly contradictory advantages. This led to a rich body of research identifying a firm's combinative properties and capabilities, such as context, culture or management skills (Gibson & Birkinshaw, 2006). Thus, the original organizational focus shifted to an activity systems level or even to the level resources and capabilities. Nonetheless, however, OA remains assuming immanent tensions from "managing two inconsistent alignments within an organization simultaneously [which] is far more complex than managing one consistent strategy after the other or externalizing one of these activities" (Raisch & Birkinshaw, 2008; Simsek, Heavey, Veiga, & Souder, 2009). This narrows OA research on focusing on a firm's capability to manage unavoidable conflicts. Consequently, strategy types based on this capability are termed management based HS (MHS).

Contrary to this, however, also consistent HS types exist, which are based on concepts allowing implementing activities positively affecting multiple competitive advantages concurrently (Jiao, Ma, & Tseng, 2003, p. 809; Chrisman, Hofer, & Boulton, 1988; Fleck, 1994). Compared to OA, however, research on such consistent HS types is limited. (Pertusa-Ortega, Molina-Azurin, & Claver-Cortés, 2009; Claver-Cortés, Pertusa-Ortega, & Molina-Azorín, 2011; Morschetta, Swobodab, & Schramm-Klein,

2006; Acquaah & Yasai-Ardekani, 2008). Affecting multiple competitive advantages simultaneously is the core mechanism of consistent HS necessitating certain resources and capabilities to be available or developed. While obviously, resources and capabilities are logically prior to a firm's activities, resources and capabilities can also be a product of a firm's unique set of activities (Spender, 1994). However, regardless of what resources and capabilities a firm possesses, 'it is never the resources themselves that are the inputs to the production process, only the services that the resources can render' (Penrose, 1959, p. 25). This points to the important difference between a resources latent market potential and its realized market potential achieved through market activities. Chrisman et al. coin this 'competitive weapons', and explain them as "the primary ways the organization applies its skills and resources to meet environmental needs and create enduring competitive advantages" (Chrisman, Hofer, & Boulton, 1988, p. 415). Consequently, a firm's competitive advantage is less dependent on resources and capabilities a firm owns per se, but rather on its way of exposing them. Analyzing origins of sustainable competitive advantage must therefore start with identifying a firm's applied competitive weapons and deducting from that a firm's underlying activities and resources and capabilities. In consequence, for consistent HS types to work, a coherently aligned activity system is mandatory, which can be achieved in two different ways: While sequential hybrid strategies (SHS) imply enhancing competitive advantages synergistically one after the other, concurrent hybrid strategies (CHS) aim at achieving combinations coinstantaneously. Furthermore, the underlying theoretical foundations vary between sequential and concurrent types. While SHS are based on systems theory, CHS are rooted in microeconomic theory applying concepts of variety, quality or innovation positively affecting both differentiation and cost (Fleck, 1994). Figure 1 provides an overview on the various hybrid strategy types.

Hybrid strategy type	Variants	Description	Theoretical grounding	Evaluation	
				Consistency	Sustainability
Management based hybrid strategy	Management based	Inevitable tensions between activities directed to multiple competitive advantages need to be balanced	Organizational and behavioral theory	Inconsistent, as strategic conflicts to be managed	Emphasis on management capabilities and organizational design
Sequential hybrid strategy	Sequential	Sequentially enhance competitive advantages	System design	Consistent, no strategic conflicts occur through modular structures	Emphasis on operational and management capabilities required to implement strategic change
Concurrent hybrid strategy	Variety Quality Innovation	Concurrently achieve multiple competitive advantages	Micro economics	Consistent, applying concepts avoiding strategic conflicts	Emphasis on operational and management capabilities required to implement micro economic concepts

Figure 1: Overview on hybrid strategy types

III.3. Consistent hybrid strategies

III.3.1. Sequential hybrid strategies (SHS)

SHS or 'outpacing strategies' combine competitive advantages by extending the strategic focus over time (Gilbert & Strebel, 1985). Its basis is a dynamic strategy concept, matching or aligning organizational resources with environmental opportunities and threats (Venkatraman & Camillus, 1984). The major part of research on SHS is empirical and based on the relationship between a firm's adaptability and its achieved performance (McKee, Varadarajan, & Pride, 1989; Snow & Hrebiniak, 1980). In essence, the key notion of sequential hybrid strategies is, that "(…) success results not from the single-minded pursuit of either strategy but from the ability to add one to the other at certain stages in the evolution of the market" (Gilbert & Strebel, 1985, p. 29). Key to success of SHS is to identify the requirement, time and degree of strategic enhancements all mainly determined by the limits of pure strategies. March considers general limitations of exploitation by too much focus on the exclusion of exploration, which leads to competency traps, inertia, and finally obsolescence (March, 1991). Contrary, too much exploration to the exclusion of exploitation leads to failure traps, leaving firm's not gaining returns on their knowledge (March, 1991, p. 71; Simsek, Heavey, Veiga, & Souder, 2009). More specifically, strategic limitations can either originate from internal or external factors of a firm. External limitations on, for example, Porter's pure differentiation strategy are a lack of customer perception on increased product quality, or missing consumer price acceptance on incremental innovations (Knyphausen & Ringlstetter, 1991, p. 553). Both of these examples lead to a marginalization of differentiation efforts at potentially higher production or transaction cost. Internal limitations on Porter's cost leadership are, for example, marginal benefits arising from additional investments in

mature technologies, or too low initial investments generating insufficient economies of scale (Kloock & Sabel, 1993).

Changes in a firm's organizational and environmental factors are main drivers of successively extending competitive advantages. Zajak and Shortell developed a model of dynamic fit based on two dimensions: Change required and change implemented (Zajac & Shortell, 1989, p. 431). They distinguish two 'dynamic fit' types, 'beneficial change' and 'beneficial inertia', from two 'dynamic misfit' types, 'excessive change' and 'insufficient change' and conclude that change is only one way of successfully handling contingencies, while another is inertia. This is true on organizational as well as on individual level. Companies use flexibility on organizational level for adapting their competitive position in volatile markets, while simultaneously using stability to sustain their achieved competitive edge. Similarly individuals seek predictable relationships and stability in behavior while simultaneously looking for variety and stimulation in organizational life (Leana & Barry, 2000). This considers both dynamic fit types concurrent forces affecting actions on collective as well as on individual level of organizations and suggest that a firm's activity system is the adequate unit of analysis for SHS (Connor, 1999). Due to sequentially achieving multiple competitive advantages, effectively attaining one, say differentiation, provides the basis for successfully utilizing another. This requires a consistent and sustainable model of SHS to pursue beneficial change and beneficial inertia simultaneously on an activity system's level, with the premise that beneficial change compensates all associated costs and risks of changing. Only if the sum of all effects is positive SHS is outperforming pure and no-emphasis strategies.

System theory provides the cornerstone of adapting activity systems for achieving SHS: First, adaptation efforts should principally kept small and second, should be limited to few and independent system parts. While the first is determined by the fit required and is, as already mentioned, mainly externally determined, the second is driven by system's architecture. System architectures differ according to the intensity of coupling subsystems. While adapting tightly coupled subsystems can even lead to the necessity of a complete redesign, loosely coupled systems allow adapting certain subsystems, without compromising the overall architecture (Orton & Weick, 1990). Such loosely coupled, modular system designs are applicable to any complex system such as products, processes, organizational structures, knowledge systems, or even customers' utility systems (Sanchez, 1995; Sanchez & Ma-

honey, 1996; Baldwin & Clark, 2000). Consequently, firm's can extend their differentiation advantage by reducing cost through economies of integration or substitution generated by substituting certain components of a system while reusing others (Garud & Kumaraswamy, 1995). Typically, however, modular system design is costly compared to integrated ones leading to a sequential achievement of first differentiation based on modularity followed by cost advantages through substitution economies.

III.3.2. Concurrent hybrid strategies (CHS)

Compared to SHS CHS differ in two ways. First, combinations of competitive advantage are achieved simultaneously, requiring underlying concepts impacting multiple competitive advantages at once and not sequentially. Second, contingencies are not key to understanding the underlying mechanism; rather it is the way firms differentiate through variety, quality or innovation allowing them to simultaneously reduce costs. In general indirect and direct cost reducing effects from differentiation can be distinguished (Fleck, 1994; Proff & Proff, 1997). Indirect cost effects from differentiation are similar for all differentiation types and result from economies of scale through increasing demand, which in turn pushes production volumes.

Contrary, direct cost effects depend on the type of differentiation. Cost reductions from variety originate from economies of scope resulting from "inputs that are shared, or utilized jointly without complete congestion. The shared factor may be imperfectly divisible, so that the manufacture of a subset of the goods leaves excess capability in some stage of production, or some human or physical capital may be a public input which, when purchased for use in one production process, is then freely available to another." (Willig, 1979, p. 346). However, not all variety reduces cost; rather 'functional variety' or 'variety for sales' which is perceived by customers has positive cost effects through increasing sales and production volumes. Contrary, negative cost consequences occur from increased internal, technical variety driving firm complexity (Huffman & Kahn, 1998). Thus, technical variety costly to the firm "should be reduced [and distinguished] from functional variety that should be encouraged" (Jiao, Ma, & Tseng, 2003, p. 812).

Quality on the other hand, positively influences direct cost by generating economies or economics of quality (Juran, 1951). The basic premise behind this mechanism is that spending more money on preventive quality leads to declining internal and external failure cost (Elshazly, 1999). According to this principle, companies can reduce their total cost by achieving a minimum of both preventive quality and failure cost (Turner, 1969). Consequently, economies of quality differ in cost effects resulting from preventive quality and operating quality management. While preventive quality allows for reducing non-value adding activities and thus the cost of the hidden plant (Miller & Vollmann, 1985), operating economies result from economies of scale and scope of utilizing freely available quality management resources and capabilities as a quasi-public input to multiple production or administrative processes.

In turn, positive cost effects from incremental compared to radical innovations are driven by economies of speed, scope and quality (Sommerlatte & Mollenhauer, 1992; Starr, 1992). Economies of speed originate from two different sources: First, shortened development times and second, fast availability and increased frequency of innovation both positively impacting market share and production volume (Gupta & Singhal, 1993; Banburry & Mitchell, 1995). As a result, research and development cost on the one hand and production and transaction cost on the other hand are reduced (Fleck, 1994). Moreover, economies of scope and quality result from utilizing not fully congested quasi-public resources and capabilities analogous to the above-explained quality and variety effects.

By achieving multiple competitive advantages concurrently cost and differentiation effects have to result from one and the same concept. Such concepts require directing a firm's activities towards multiple competitive advantages without causing inconsistencies in the overall activity system. Concepts providing such consistency are for example mass customization or total quality management (Fleck, 1994). For analyzing the consistency of the applied concepts an activity system and activity level is mandatory as otherwise implementing some activities can thwart others causing inconsistent configurations.

IV. The activity based view of strategy (ABV)

Activity theory originated from the field of psychology in Russia in the 1920s. With a focus on explaining personality, the theory's core assumption is the unity of consciousness and activity, thereby consciousness meaning not a set of "discrete disembodied cognitive acts" but its location "in everyday practice" (Nardi B. , 1998; Vygotzki, 1978). Simply put, personality manifests in what you do, meaning 'you are what you do'. In this line of reasoning, human personality is the aggregate of her or his social relationships, which are realized by the aggregate of multifaceted activities. Both, consciousness and activity are situated phenomena, in which material and social context is crucial. In addition, activities are not isolated from each other but ordered hierarchically forming the nucleus of personality (Leontov, 1978).

In a general model of activity systems Engeström determines three key relations: the relations between object-oriented activity, agents and the community of which they are part of (Engeström, 1987). Thus, the production of activity requires a subject, an object of activity, tools applied in the activity, and output generating actions and operations (Nardi B. A., 1996). Or put differently, analyzing human activity requires in addition to capturing the kinds of activities humans engage in, the examination of who is engaging in the activity, what are their goals and intentions, what objects result from the activity, what rules and circumstances accompany that activity, and the larger community in which the activity occurs (Jonassen & Rohrer-Murphy, 1997). An activity is 'the performance of conscious actions and consists of a chain of actions. Actions are chains of operations." (Jonassen & Rohrer-Murphy, 1997, p. 63). In this view, actions are different from activities, as actions contribute towards the ultimate satisfaction of a need but do not satisfy them (Leontov, 1978). However, actions constitute activities, which eventually satisfy a need. Thus, all actions and interactions contributing towards the fulfilment of specific needs are part of the activity (Zott & Amit, 2010). Actions are discrete, have clear beginnings and endings, and exist over short time-scales. They are goal oriented. 'Activities' on the other hand are complex patterns of practice that endure over long time periods. Activities suggest goals and provide motives" (Blackler, 2000, p. 280). Operations, on the other hand are actions performed consciously, or put differently, with practice and internalization the conscious effort declines and activities collapse into actions and eventually into operations. This dynamic relationship works reverse as well, if disruptions increase conscious efforts (Jonassen & Rohrer-Murphy,

1997). Such disruptions are not solely external but can be internal as well, as activity systems are disturbance producing systems, forcing their own development (Engeström, 1987). The subject of an activity is an individual or a group of individuals engaged in the activity, while the object is a physical or mental product the activity seeks to achieve. Furthermore, tools are enabling the transformation process initiated by activities. Subjects work in communities, which determine the social interactions among participants as well as the shared beliefs and values that define or affect the activity (Jonassen & Rohrer-Murphy, 1997).

ABV is grounded on activity theory and thus, similarly to the identification of human personality, characterizes firms by 'what they do' in context specific situations. That corresponds to Selznick's notion of an organization's character as their distinct and integrated "commitments to ways of acting and responding" (Selznick, 1957, p. 57). In strategic management research synonyms used for the ABV are micro activities, micro strategy or strategizing, strategic practices or strategy as practice (Allen & Helms, 2006; Johnson & Huff, 1997). ABV focuses on 'detailed processes and practices which constitute the day-to-day activities of organizational life and which relate to strategic outcomes' (Johnson, Leif, & Whittington, 2003, p. 3). Among the main goals of the ABV is understanding the numerous micro activities making up strategy and strategizing in practice allowing entering the 'black box' of activities and probe deeper and gain better understanding "of the micro-mechanisms of business models" (Zott & Amit, 2010, p. 224). Activities are seen as the engagement of assets, resources and capabilities to serve a specific purpose toward fulfilling an objective. Correspondingly, activity systems are sets of interdependent activities within and across a firm's boundaries (Zott & Amit, 2010, p. 217). Organizations can be seen as networks of overlapping activity systems or simply activity networks (Blackler, 2000). Thus, ABV stresses the role of firm activities, routines, and business processes in achieving competitive advantage through the engagement of a firm's resources and capabilities (Sheehan & Foss, 2007). The underlying logic of ABV is that firms are paid for the activities they perform to provide products or services to consumers and not for products per se (Sheehan & Foss, 2007; Porter, 1985). Activities can be considered on different levels such as top-level activities of planning, sourcing, manufacturing or delivering or at the level of sub-activities (Davenport, 2005). Competitive advantage then results from achieving a favourable – meaning unique and valuable –

position within the industry involving a different set of activities (Mintzberg, Lample, Quinn, & Goshal, 2003). Thus, certain combinations of activities are found to be more effective than others (Sheehan & Foss, 2007; Allen & Helms, 2006, p. 452). Consequently, "different positions (with their different tailored activities) require different product configurations, different equipment, different employee behavior, different skills, and different management systems" (Mintzberg, Lample, Quinn, & Goshal, 2003, p. 20). In this line of argument, competitive advantage can only be sustained by achieving fit within a firm's activity system. Such fit can be achieved in three different forms, first consistency, second mutual reinforcement, and third, comprehensive system optimization (Mintzberg, Lample, Quinn, & Goshal, 2003). Fit within the activity system allows for distinguishing strategic implementations in those, which are factually inconsistent, and those, which seem to conflict on high level, but fit consistently on lower levels (Sheehan & Foss, 2007, p. 219). Competitive advantages then result from the fit of the entire system of activities and strategy is about combining activities (Mintzberg, Lample, Quinn, & Goshal, 2003). This is similar to Porter's value chain, which decomposes a firm's activity system into functions and activities from which competitive advantages result (Porter, 1985). However, Porter adds with activity drivers another level of analysis to ABV representing "the underlying source of competitive advantage" (Pearce & Robinson, 2005, p. 104) by explaining why a firm's set of activities is generating more value than a competitor's (Sheehan & Foss, 2007, p. 453). Drivers can be used to manipulate the value chain either in terms of cost and in terms of differentiation or in order to improve fit within a firm's activity system (Sheehan & Foss, 2007; Ghemawat, 2006). They are generic and structural in nature, what requires a firm's management to adapt drivers firm specifically. This way, drivers make competitive advantage operational (Pearce & Robinson, 2005). Competitive advantage then results from the sum of cost and value generated by each firm activity and can only be determined relative to a firm's competition (Sheehan & Foss, 2007). Drivers are distinct from resources, as drivers need to be made controllable by the firm, while resources need to be organized and developed according to the logic inherent in a firm's activity system (Sheehan & Foss, 2007, p. 458). Furthermore, drivers are generic, while an activity system is a concrete manifestation of how a firm does business occurring on two levels. First, the individual activity and second, the collective, overall activity system orchestrating activities within a firm's internal and external value chain (Allen

& Helms, 2006). Despite the unilateral relationship of drivers on collective level, on individual level single activity drivers operationally influence multiple activities and vice versa.

ABV benefited from other important strategy schools, such as the RBV, which focuses on unique resources and capabilities as drivers of superior performance (Barney, 1991). In this notion, competitive advantage results from barriers to imitation (Mahoney & Pandian, 1992, p. 371). These barriers rest on the assumption of inefficient factor markets (Bongartz, 1997). Hence, the possibilities of a firm are not a function of opportunities it confronts; rather it is a function of what resources an organization controls (Teece, Pisano, & Shuen, 1997). Consequently, competitive advantages are located 'upstream' of product markets (Teece, Pisano, & Shuen, 1997, p. 513). In this sense, strategic resources and capabilities are scarce, firm-specific, valuable and difficult to imitate. Thereby, a resource refers to a tangible or intangible firm asset or input to production owned, controlled, or accessed on a semi-permanent basis (Helfat & Peteraf, 2003). Contrary capabilities are special types of firm-specific resources enhancing the productivity of a firm's other resources by coordinating a set of tasks and utilizing resources (Makadok, 2001). Typically firms consist of and use a combination of resources and capabilities. Often resources are 'co-specialized' and value derives only from certain combinations (Teece, 2009). In contrast to RBV thinking ABV considers the availability of bundles of heterogeneous assets, resources and capabilities a necessary but not sufficient prerequisite for achieving competitive advantages. Rather it emphasizes the importance of transforming resources into competitive weapons through activities (Porter, 1991; Stalk, Evans, & Shulman, 1992; Chrisman, Hofer, & Boulton, 1988). Thus, competitive advantage rests on a firm's activity system, the performed activities and its industry specific activity drivers. In ABV, competitive advantage results from "mechanisms through which resources and capabilities get exposed to market processes where their ultimate value and ability to generate competitive advantage are realized" (Ray, Barney, & Muhanna, 2004, p. 35). In this notion, resources and capabilities are stocks which have no value per se and can even destroy value if storing the resource, such as unemployed labor, generates cost. Value is generated by elaborating the resource or capability in firm activities rendering products or services. Thus, RBV is incapable of explaining how resources create competitive advantage as it lacks the linkage between resources and product markets (Priem & Butler, 2001; Wang & Ahmed, 2007). For instance, underemployed labour

is a cost-generating stock, which is potentially value creating if employed to produce something the market demands. Finally, it needs to be stated that none of the above-mentioned steps in isolation is sufficient to generate competitive advantage. Rather, RBV and ABV are compatible and even complement each other (Sheehan & Foss, 2007, p. 452). While RBV is focused on managing a firm's portfolio of resources, ABV is concerned with elaborating a firm's resource portfolio (Dierickx & Cool, 1989; Black & Boal, 1995). In this sense, RBV is more static in nature and describes what pool of resources and capabilities is available to the firm. ABV is complementing this view by explaining how a firm's resource pool is applied and dynamically developed.

Closely related to RBV, the dynamic capabilities school intends to explain the dynamic development of a firm's stock of resources. Thus, dynamic capabilities are defined as 'the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments' (Teece, Pisano, & Shuen, 1997, p. 516). In this sense, dynamic capabilities are capabilities in a firm's overall capability portfolio allowing for adapting the portfolio. Another definition by Eisenhardt and Martin stresses the procedural character of dynamic capabilities as they are 'the firm's processes that use resources – specifically the processes to integrate, reconfigure, gain and release resources – to match and even create market change' (Eisenhardt & Martin, 2000). This can be seen as a response to the static nature of RBV but reduces the market adaptation requirements to the level of processes and routines. However, capabilities are not processes; rather they are embedded in processes (Wang & Ahmed, 2007). While processes are often explicit and codified structures, capabilities are a firm's combinative capacity to deploy resources including explicit processes as well as tacit elements embedded in processes (Wang & Ahmed, 2007). The genesis of competitive advantage from dynamic capabilities is disputed among academia. Eisenhardt and Martin consider dynamic capabilities as just another type of capability negating their potential to generate sustained competitive advantage (Eisenhardt & Martin, 2000, p. 1117). In their view, dynamic capabilities can only generate temporary competitive advantage by being applied sooner, more astutely, and more fortuitously to create resource configurations (Eisenhardt & Martin, 2000). Contrary, others argue that dynamic capabilities can sustain competitive advantage by continuously achieving fit with changing market environments by "transforming firm resources and capabilities into outputs in such forms as products or services

that deliver superior value to customers" (Wang & Ahmed, 2007). Hence, dynamic capabilities are in line with RBV's general argument of achieving sustainable competitive advantage through idiosyncratic, firm-specific, valuable and rare resources, which are in this case dynamic (Barney, 2001). Correspondingly, despite deepening the insights into the mechanisms of generating competitive advantage by dynamically fitting a firm's resource and capabilities portfolio to market needs, it still lacks an explanation of the underlying generative mechanisms producing competitive advantage. ABV, however, with its dedicated and clearly differentiated focus on activities is able to explain this. Despite the delineation between activities and dynamic capabilities is small but essential and can simply be put as a difference of 'what can be done?' versus 'what is done by whom in which context?'.

A last important school having impetus on ABV is the strategy process school (Jarzabkowski, 2005). This research stream developed simultaneously in Canada, UK, and Sweden (Pettigrew, 1977; Mintzberg, 1973; Mintzberg, Raisinghani, & Theoret, 1976; Jönsson & Lundin, 1977). It made major contributions such as the opening up of the 'black box' of organizations, the inclusion of human beings and actions as well as the legitimation of in-depth case studies (Johnson, Leif, & Whittington, 2003). All these contributions are relevant for ABV in general and this review in particular. However, the process school has limitations, which ABV is able to lift. Among the most relevant are its reliance on second-hand information and retrospective reports, its focus on top managers as strategic actors, its lack of practical implications, its separation of content and process, its limited ability to produce general theory and its missing link to strategy outcomes (Mazzola & Kellermanns, 2010; Johnson, Leif, & Whittington, 2003). ABV also aims at digging further into the organizational black box but intends to do so by explaining the underlying practices and activities, which underpin and constitute strategic phenomena. ABV overcomes the process school's limitations by closely engaging with practice involving managers not just as primary sources of information but also as research collaborators coproducing knowledge (Eden & Huxham, 1996). In addition, ABV's research focus on micro activities constrains research designs as well as the scope and units of analysis (Johnson, Leif, & Whittington, 2003). Moreover, in ABV both, strategy content and process merge considering both as essential drivers of firm activity. Additionally, ABV allows to link macro phenomena, such as competitive advantages firms achieve within its industry, with micro explanations (Johnson, Leif, & Whittington, 2003). While in the

strategy process school competitive advantage results from a firm's strategic processes, in ABV micro-activities engaging resources in accordance with strategic processes and contents are seen as sources of competitive advantage.

V. Literature review on hybrid competitive strategies

V.1. Literature review on empirical research on HS

The review is based on 34 empirical contributions on HS starting 1980 and ending 2012. As explained above, the type of management based HS and the corresponding body of research on 'organizational ambidexterity' is excluded as it violates the consistency principle. The theoretical basis of the empirical research reviewed is either industrial economics (IE), the resource base view of the firm (RBV), or the strategy process school (PS). The ABV is not yet used for analyzing HS empirically. Research on generic strategies is coded, even if not explicitly stated in the literature reviewed, as IE. Correspondingly, research intending to uncover resources or capabilities of HS is coded RBV, while research trying to differentiate between intended and emergent strategy patterns are used as an indicator for PS. The majority of contributions, 71% or 24, empirical studies are based on IE, followed by the RBV with 26% or 9 studies. Only the study of Parnell used strategy process thinking for empirically analyzing generic strategies' deliberate and emergent patterns (Parnell, 2000). In 94% of the empirical studies, the unit of analysis is explicitly stated and is unanimously an individual business unit of a diversified, multi-business unit company or a single unit company. This corresponds to the high amount of single industry-focused studies, which accounts for 50% of all contributions. The remaining studies included an average of 5.5 industries with a standard deviation of 12.6. Robinson and Pearce's study on the relationship of intended strategies and planning includes with 60 industries the highest number in this review (Robinson & Pearce, 1988). The number of business units analysed within each research is high and averages 255 with a median of 125. For research on that scale, typically, tools such as surveys are required for data collection. And indeed, of the 9 researches using solely surveys for data collection 8 explicated the number of business units analysed and 5 are marking the top with 599 business units or more. For example Spanos et al.'s study on strategy and industry effects on profitability is based on the Greek manufacturing data base and includes 1921 business units – the highest number of the literature sample (Spanos, Zaralis, & Spyros, 2004). In addition to pure surveys, which accounted for

26%, the most frequently applied method was collecting primary data with questionnaires (35%) followed by primary interviews (9%). However, in about one third of the studies combinations of methods were applied. Most frequent combinations are found for primary questionnaires and secondary surveys (21%) followed by primary interviews and questionnaires (6%). Combining all three methods is rare and is only applied in three percent of all studies. The 34 empirical studies use factor, cluster, regression, correlation, variance and meta analysis as well as causal modelling. While 65% of all studies used one of the first three analysis tools (FA 29%, CA and RA each 18%), the rest does not account for more than 6% individually. However, similarly to methods in data collection, combinations of analysis methods are used. The research period is, however, less conclusive as almost one third of studies did not explicate the research period. Only two of the remaining state an explicit period of one. The rest has an average longitudinal cut of 3.8 years, with a median of four and a standard deviation of almost two. The longest period (10 years) cover Leitner and Gueldenberg in their study on generic strategy and strategic change (Leitner & Güldenberg, 2009). The strategy construct is operationalised by variables ranging from a minimum of three to a maximum of 42 with an average and mean of 16 and a standard deviation of nine. Thus, strategies are typically empirically measured by a small amount of high level strategy variables. An example of this is the study of Beal and Yasai-Ardekani on the relation of competitive strategies and management functional expertise (Beal & Yasai-Ardekani, 2000). In this study the strategy construct is empirically measured by strategy variables such as R&D of new products, marketing of new products, selling high priced products or building brand or company identification (Beal & Yasai-Ardekani, 2000, S. 744). The following figure 2 presents a descriptive summary on the empirical literature analysis.

60: OVERVIEW ON ANALYSIS OF EMPIRICAL HS STUDIES

On average, the studies identified combinations of competitive advantages in 18% of all business units included, with a median of 20% and a standard deviation of nine. The highest percentage of HS within a sample identified White with a combination of questionnaire and secondary data analysis using the PIMS database applying variables of relative product quality, image, breadth and new products (White, 1986). Thus, 19 companies of the 69 appeared to combine cost and differentiation advantages and achieved an ROI of over 30%. Moreover, with 44 %, almost half of all research studies

identified and described 'hybrid' resources, capabilities and activities either on a specific or general level. Fifty four percent of these studies identified meta or general capabilities, followed by specific capabilities and a firm's activity system with 33% and 14% respectively. In only one case, early market entry with 95% of HS being pioneers or early entrants is identified as vital for HS (Miller & Dess, 1993). Interestingly, none of the analysed researches regards resources, no matter if specific or general, crucial for achieving and sustaining HS. An overview on the identified sources of HS is provided in figure 3.

Sourcres of HS	Description	Author
Meta or general capabilities	Quality and synergy management	Miller & Friesen, 1986)
	Integration of conflicting orientations	Miller, 1987
	Capability to manage strategy and resource needs	Reitsperger et al., 1993
	Management of strategic consensus, integrative strategic understanding, aligned strategy formulation and implementation	Kotha et al., 1995)
	Developing of distinctive competencies - the more the better	Wright et al., 1995
	Management consensus	Bowman & Ambrosini, 1997
	Strong management and technology capabilities	Parnell, 2011
	Mediating role of organizational complexity, formalization, decentralization	Claver-Cortés et al., 2012
Specific capabilities	Planning sophistication	Robinson & Pearce, 1988
	Investment and risk management	DeCastro & Chrisman, 1995
	Production capability, flexibility, continuous improvement	Yamin, Gunasekaran, & Mavondo, 1999
	Accounting experience a pre-requisite, combination of R&D, marketing, sales, engineering essential for achieving hybrid strategies	Beal & Yasai-Ardekani, 2000
	Marketing expertise, production flexibility and speed	Parnell., 2000
Activity system	Primary activities locally dispersed; central support	Roth & Morrison, 1992
	Consistency of value chain	Reitsperger et al., 1993
Competitive sequence	Early market entry as pioneers or early entrants	Miller & Dess, 1993

Figure 2: Identified sources of HS

V.2. Analysis of theoretical research on HS

16 theoretical research contributions on HS are reviewed in a range from 1984 to 2001, with a median of 1988. Seven different theories mark the basis for theoretical research on HS, with contingency theory used for 25% of all contributions. Of these contingency-based contributions, 80% are from 1988 or earlier and identify internal or external contingencies relevant for achieving HS. Gilbert and Strebel's sequential hybrid strategies, for example, consider the industry lifecycle a key contingency (Gilbert & Strebel, 1985). Similarly, Hill interrelates the impact that differentiation has on demand to "three major contingencies: the ability of the firm to differentiate its product, the competitive nature of the product market environment, and the commitment of consumers to the products of rival firms" (Hill, 1988, p. 404). Moreover, Murray assumes that strategic viability depends on the presence of a number of environmental preconditions (Murray, 1988). Cost theory – in most cases a combination of

both, production and transaction cost – is founding the basis for 20% of all theoretical research reviewed. These researches argue that differentiation has positive and negative impacts on a firm's overall cost position and consequently, total cost effects on differentiation can be positive. According to this argument, differentiation expands demand, raises market share, enlarge production volume and leads to economies of scale (Karnani, 1984). Similarly, a broader market or product scope provides the basis for economies of scope. However, as transaction cost are a function of the complexity of its product and market choices differentiation raises transaction cost in parallel (Jones & Butler, 1988). Accordingly, for HS to be successful the beneficial cost effects from differentiation must outweigh additional cost. Following this argument, Jones and Butler infer from production and transaction cost a firm's total cost function and argue that "firms will differentiate their products and markets to the extent that minimizes the sum of production and transaction costs" (Jones & Butler, 1988, p. 207). Contrary, Belohlav's in its investigation of the relationship of quality and cost focuses purely on production cost or more specifically on total cost of quality (Belohlav, 1993). In this notion, failure not quality is expensive, as it may lead to losing customers and require operating the 'hidden plant', meaning 'people, floor space, and equipment used for nothing but finding and fixing things that should have been done right the first time' (Belohlav, 1993, p. 60). Thus, Belohlav concludes that 'well-organized quality initiatives are not just cost effective but are also the most cost effective strategies for an organization' (Belohlav, 1993, p. 61). Additionally, three theoretical works develop new conceptual frameworks based on existing generic or manufacturing strategy classifications (Chrisman, Hofer, & Boulton, 1988; Kotha & Orne, 1989; Faulkner & Bowman, 1992). Chrisman et al. for example develop a classification system for "realized" business strategies by evaluating the strengths and weaknesses of the widely cited schemes of Porter and Abell (Porter, 1980; Abell, 1980; Mintzberg, 1978). Taxonomically analyzing the dimensions of 'presence of segment differentiation', type of competitive weapon accounting for business's revenues', and 'scope' leads them to derive "utility strategies", which "represent businesses that use cost and benefit weapons simultaneously in their principal product and market segment or segments" (Chrisman, Hofer, & Boulton, 1988). In a similar approach reclassifying generic manufacturing strategies along the three primary dimensions of 'process structure complexity', 'product line complexity', and 'organizational scope' Kotha and Orne characterize industry-wide, cost and differentiation strategies by "very high organizational scope

(scale), complex product lines, and production processes that are highly integrated" (Kotha & Orne, 1989, p. 226). Furthermore, two theoretical researches are based on analyzing cost, revenue and profit impacts of HS. In this microeconomic tradition, Wright found a positive relationship between market share and ROI. Thus, larger firms can compete either on cost or on differentiation and are likely to choose "the one which seems to them to have the better prospects for profitability, given the characteristics of the industry in which they compete" (Wright, 1987, p. 100). Moreover, following this line of argument, Fleck characterizes concurrent HS types as positively affecting both parts – cost and price – of the microeconomic profit function (Fleck, 1994). Proff and Proff & Proff are following the same approach, however further explaining hybrid value chain based concepts by decoupling individual activities and directing them on either cost or differentiation advantages (Proff, 2000; Proff & Proff, 1997). In this notion, Proff argues that a strategic separation between decreasing cost and growing customer benefits along the value chain is possible by focusing the first on cost-oriented downstream activities and the later on sales-oriented upstream activities (Proff, 2000). Game theory, which initiated the theoretical discussion on HS, is only applied once. In Karnani's view competitive strength results from an appropriate combination of differentiation and cost position (Karnani, 1984). This fits the empirical findings of Hall, who concluded that firm's deliver at lowest cost with acceptable quality or highest differentiation with acceptable cost (Hall, 1980). Consequently, competitive advantages are continuously substitutable and thus, Karnani concludes "it seems more appropriate to think of differentiation and cost position as dimensions of competitive strategy rather than generic competitive strategies" (Karnani, 1984, p. 378).

In the following, a detailed quantitative review on theoretical research on HS is presented. Seventy-five percent of all reviewed research uses independent cost and differentiation dimensions for combining competitive advantage. The remaining assumes a continuum along one single cost dimension. Based on that strategy constructs, 65% theoretically infer concurrent HS, while only 29% derive inconsistent management based HS. Conclusions regarding managing cognitive dissonances are used as indicators for inconsistent management based HS. Only Gilbert and Strebel's outpacing strategy based on an industry lifecycle contingency presents a way to avoid such conflicts by sequentially adopting one competitive advantage after the other (Gilbert & Strebel, 1985). As mentioned above, the under-

lying mechanisms providing the basis for HS are cost and differentiation. In 86% of all cases it is argued that differentiation generates positive cost effects through increasing quantity sold. Thus, cost effects resulting from that are separated in scale economies (41%), direct cost effects (38%), scope economies (31%) and learning curve effects (17%). Contrary to this relatively abstract cost effects, the most recent researches included in this review show an interest in further detailing the underlying cost mechanisms resulting from quality (14%) and innovation (10%) (Belohlav, 1993; Fleck, 1994; Proff & Proff, 1997). In line with this reasoning, prices are either a legitimation for differentiation (56%), an indication for cost leadership, implicitly assuming minor quality (33%), or competitive weapons, underpinning the fact, that possessing the before mentioned competitive weapons per se is not sufficient. Rather, they need to be applied in the market (11%). The following figure provides a descriptive summary on the theoretical literature analysis.

Review criteria		**Amount of publications** *(n=16)*	**Description**
Theoretical basis *(n=20)*	Contingency theory	5	HS depend on specific contingencies, such as industry or product lifecycle
	Production cost theory	4	Differentiation increases demand and market share, allows price increases, enlarge production volume and
	Transaction cost theory	3	leads to economies of scale and scope; complexity of product and market choices can raise transaction cost
	Taxonomical analysis	3	New conceptual frameworks based on existing generic or manufacturing strategy classifications
	Microeconomics	2	Detailed analysis of impact HS has on cost, revenue and profit
	Value chain analysis	2	Cost and benefit impacts assigned to different value chain activities
	Game theory	1	Strategy involving high differentiation and high market share is consistent
Strategy construct *(n=16)*	Independ. dimensions	12	Different competitive dimensions allow combinations of cost and differentiation
	Continuum	4	Production and / or transaction cost along a single continuum; differentiation effects decreasing cost
Identified HS *(n=17)*	Concurrent	11	Concurrently achieve multiple competitive advantages
	Management Based	5	Potential cognitive dissonance applied as indication for management based HS
	Sequential	1	Sequentially enhancing competitive advantages
Underlying competitive mechanisms			
Cost effects *(n=29)*	Scale effects	12	Differentiation driven market share increase leads to economies of scale
	Direct cost effects	11	Differentiation increases cost; but market share positively affects e.g. purchasing, funding , channel access
	Scope effects	9	Differentiation through market and product range leads to scope effects
	Learning curve	5	Differentiation increases market share and leads to cumulative efficiency effects
	Quality effects	4	Quality reduces the incidence of defects and lowers costs (economies of quality)
	Innovation effects	3	(Incremental) innovation allows short run monopoly and shorter development times (economies of speed)
Differentiation effects *(n=14)*	Quantity	11	Quantity positively impacting production and transaction cost
	Quality	2	Quality reducing production and transaction cost
	Diversification	1	Diversification generating scope effects
Price effects *(n=9)*	Diff. legitimates price	5	Price indicates differentiation advantages
	Price compensates cost	4	Price indicates cost leadership
	Price is comp. weapon	1	Price as competitive weapon, which applies cost advantages
Hybrid sources *(n=11)*	Activities	8	Composition of distinct value chain activities
	Capabilities	3	Only general or meta capabilities identified
	Resources	0	Resources not considered essential in achieving and sustaining HS

Figure 361: Overview on analysis of theoretical HS contributions

More than half of all theoretical researches identified and described 'hybrid sources' (63%) with a majority determining a firm's activity systems as essential (73%). The three remaining theoretical works determined general but no specific capabilities. The theoretical findings on resources do confirm the above-mentioned empirical findings, as neither general nor specific resources are considered

vital for HS. Figure 5 provides an overview on theoretically derived sources of HS. The group of research determining a firm's activity system an essential source for HS shares the idea of decomposing the value chain and focusing individual activities on different competitive advantages. On an aggregated level, thus, combinations of competitive advantages are feasible. However, differences exist on how such an approach can be consistently applied within a firm's activity system. Altogether, five cases (71%) predict cognitive dissonances from combining various individual foci within a firm's overall value chain (Wright, 1987; Wright & Parsinia, 1988; Faulkner & Bowman, 1992). Only one of them provides a basis for managing these conflicts by sequentially ordering strategic foci in time (Gilbert & Strebel, 1985). The remaining two cases assume concepts consistently orchestrating value chain activities. Such a 'management view', however, requires a consistent orchestration between upstream and downstream oriented activities along the value chain. One important prerequisite for such a separation is that "customers put a greater value on some of the elements in the value chain than on others, and if this then leads to a bigger increase in benefits but not, at the same time, to a bigger increase in costs" (Proff, 2000, p. 546). The group of theoretical research identifying meta or general capabilities consists of three and range from 'managing efficiency, quality and just-in-time production', over 'managing total quality; cross functional, process oriented organization', to 'managing synergy, quality, time, complexity and flexibility' (Hill, 1988; Belohlav, 1993; Fleck, 1994).

Sources of HS	Description	Author
Activity system	Decomposing value chain; cognitive dissonance; sequential ordering	Gilbert & Strebel, 1987
	Decomposing value chain; cognitive dissonance	Wright, 1987
	Decomposing value chain; cognitive dissonance	Murray, 1988
	Decomposing value chain; cognitive dissonance	Wright & Parsinia, 1988
	Decomposing value chain; cognitive dissonance	Faulkner & Bowmann, 1992
	Consistently managing value chain activities	Proff & Proff, 1997
	Consistently managing value chain activities	Proff, 2001
Meta or general capabilities	Managing efficiency, quality and just-in-time production	Hill, 1988
	Managing total quality; cross functional, process oriented organization	Belohlav, 1993
	Simultaneously managing synergy, quality, time, complexity and flexibility	Fleck, 1995

Figure 4: Identified sources of HS

V. Future research potential

Insights in three different sections result from the above literature review: First, from the intersection of theoretical and empirical research, second and third, from an individual view on the current state of theoretical and empirical research.

A major research issue was uncovered at the intersection of theoretical and empirical research. The literature review reveals a gap between empirical research identifying main sources of HS in capabilities, while theoretical works' emphasis is on activities. Thus, it remains unclear what are the underlying mechanisms allowing some firms to establish HS successfully, while others struggle achieving it. For future research, one of the major challenges is to find a common basis for theoretical and empirical research. ABV potentially can offer such a basis.

In most theoretical works' the focus is on inconsistent MHS causing cognitive dissonances from combining contradicting activities. Thus, future research is required to identify consistent concepts of HS, what necessitates activities as the level of analysis. Moreover, the theoretically available, existing CHS concepts lack explanations on the level of underlying mechanisms, which may cause problems for empirical research level. Consequently, developing an activity-based theory of HS can provide a basis for further empirical investigations.

Empirically we expect substantial research progress through adding ABV to the discussion on HS. While in the current state of empirical research the resource and capability focus dominates, it lacks a view on firm activities. Thus, it leaves the question of 'what activities are required for combining several competitive advantages' unanswered. Thus, a first issue in the current state of empirical of research is the degree of explaining the occurrence of HS. In critical realist terms, only the empirical level is addressed by establishing a relationship between strategy type and performance. However, the underlying actual and real levels explaining these mechanisms remain undiscovered. For a detailed explanation of critical realism, see Bhaskar (Bhaskar, 2008; Johnston & Smith, 2010). Activities, which are located in the real domain, however, cannot be linked directly to firm performance, which is a sine qua non-characteristic of HS (Johnson, Leif, & Whittington, 2003). They only explain the configuration of resource and capabilities and allow analyzing their engagement in a specific competitive environment (Johnson, Leif, & Whittington, 2003). This, however, covers only half of the story to HS outstanding performance, namely the internal perspective. Despite this internal perspective including the absorptive and adaptive capacity of understanding market needs and (re-)configuring a firm's activity systems and resource portfolio, *the mechanism of how* HS outstanding performance is achieved through activities is missing. Thus, a link between activities and the genesis of competitive

advantage as the driver of firm performance needs to be established. Empirical research on this topic is exclusively based on positivistic research mainly driven by quantitative methods, such as questionnaires and surveys. This tendency is also proofed by the fact, that in the context of generic competitive strategies the ABV was not applied once for discovering activity configurations (Allen & Helms, 2006). For understanding, however, the micro activities necessary to establish HS, a deeper and qualitative understanding is required. Thus, the research philosophy and design applied are required to cover both, digging into the black box of the organization in situated context and providing a basis for broader generalization. Such a research approach necessitates a research design enabling close engagement with practice aiming to uncover the underlying mechanisms responsible for generating sustainable hybrid competitive advantages (Johnson, Leif, & Whittington, 2003). In consequence, direct involvement of practitioners is a pre-requisite for ABV research.

Another issue arising from the theoretical discussions on the topic is to test the fundamental assumption of HS meaning differentiation drives quantity and in turn improves cost. For testing such an actual mechanism, however, a detailed analysis of the underlying differentiation activities and their corresponding effects on other activities within a firm's value chain is required or put differently; it is needed to establish a chain of evidence for the underlying mechanisms of HS. Such a chain needs to entail all of the following: a firm's pool of resources and capabilities, its activity systems and activities, its applied competitive weapons in product markets, as well as its competitive advantages and the corresponding level of performance achieved.

References

Abell, D. F. (1980). *Defining the business: The starting point of strategic planning.* Englewood Cliffs.

Acquaah, M., & Yasai-Ardekani, M. (2008). Does the implementation of a combination competitive strategy yield incremental performance benefits? A new perspective from a transition economy in Sub-Saharan Africa. *Journal of Business Research Vol. 61* , 346–354.

Alchian, A., & Demsetz, H. (1972). Production, Information Costs, and Economic Organization. *American Economic Review, Vol. 62* , 777-795.

Allen, R. S., & Helms, M. M. (2006). Linking strategic practices and organizational performance to Porter's generic strategies. *Business Process Management* , 433-454.

Amit, R., & Schoemaker, P. J. (1993). Strategic assets and organizational rent. *Strategic Management Journal, Vol. 14* , 33-46.

Bain, J. (1968). *Industrial Organisation (2nd edition).* New York.

Baldwin, C. Y., & Clark, K. B. (2000). *Design Rules: The power of modularity.* Boston, MA.

Banburry, C. M., & Mitchell, W. (1995). The effect of introducing important incremental innovations on market share and business survival. *Strategic Management Journal, Vol. 16* , 161-182.

Barnard, C. I. (1938). *The functions of the executive.* Cambridge, MA.

Barney, J. B. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Marketing, Vol. 1* , 99-120.

Barney, J. B. (2001). Is the resource-based 'view' a useful perspective for strategic management research? Yes. *Academy of Management Review, Vol. 26, No. 1* , 41-56.

Barney, J. B. (1986). Organizational culture: Can it be a source of sustained competitive advantage? *Academy of Management Review, Vol. 11* , 656-665.

Beal, R., & Yasai-Ardekani, M. (2000). Performance Implications of Aligning CEO Functional Expe-rience with Competitive Strategies. *Journal of Management, No.4* , 733-762.

Belohlav, J. (1993). Quality, Strategy and Competitiveness. *California Management Review, Vol. 35, No. 3* , 55-67.

Bharadwaj, S. G., Varadarajan, P. R., & Fahy, J. (1993). Sustainable competitive advantage in service industries: A conceptual model and research proposition. *Journal of Marketing, Vol. 57* , 83-99.

Bhaskar, R. (2008). *A Realist Theory of Science (2nd edn).* London: Verso.

Blackler, F. (2000). Organizing processes in complex activity networks. *Organization, Vol. 7* , 277-300.

Bongartz, U. (1997). Strategische Ressourcen und erhaltbare Wettbewerbsvorteile. *Zeitschrift für Betriebswirtschaft, Ergänzungsheft 1/97* , 21-43.

Booth, M. E., & Philip, G. (1998). Technology, competencies, and competitiveness: The case for reconfigurable and flexible strategies. *Journal of Business Research, Vol. 41* , 29-40.

Bowman, C., & Ambrosini, V. (1997). Perceptions of strategic priorities, consensus, and firm performance. *Journal of Management Studies, Vol. 34* , 241-258.

Buzzel, R., & Wiersema, F. (1981). Erfolgsstrategien im Kampf um Marktanteile. *Harvard Business Manager, No. 4,* , 7-18.

Buzzel, R., Gale, B. T., & Sultan, R. (1975). Market Share: A Key to Profitability. *Harvard Business Reviews, Vol. 53, No.1* .

Campbell-Hunt, C. (2000). What Have We Learned About Generic Competitive Strategy? A Meta-Analysis. *Strategic Management Journal, No. 21* , 127-154.

Chmielewski, D. A., & Paladino, A. (2007). Driving a resource orientation: reviewing the role of resource and capability characteristics. *Strategic Management Journal, Vol. 45, No. 3* , 462-483.

Chrisman, J. J., Hofer, C. W., & Boulton, W. R. (1988). Toward a System for Classifying Business Strategies. *Toward a System for Classifying Business Strategies, in: Academy of Management Review* , 413-428.

Christensen, C. R., Andrews, K. R., Bower, J. L., & Learned, E. P. (1969). *Business policy: Text and cases.* Homewood, Ill.

Claver-Cortés, E., Pertusa-Ortega, E. M., & Molina-Azorín, J. F. (2011). Characteristics of organizational structure relating to hybrid competitive strategy: Implications for performance. *Journal of Business Research* , doi:10.1016/j.jbusres.2011.04.012.

Coase, R. H. (1937). The Nature of the Firm. *Economica* , 386-405.

Connor, T. (1999). Customer-led and market-oriented: a matter of balance. *Strategic Management Journal 20* , 1157-1163.

Davenport, T. (2005). The coming commoditization of processes. *Harvard Business Review, Vol. 74* , 100-108.

DeCastro, J., & Chrisman, J. J. (1995). Order of Market Entry, Competitive Strategy, and Financial Performance. *Journal of Business Research, Vol. 33* , 165-177.

Dess, G. G., & Rasheed, A. M. (1992). Commentary: Generic strategies: classification, combination and context (D. Miller). *Advances in Strategic Management* , 409-416.

Dierickx, I., & Cool, K. (1989). Asset Stock Accumulation and Sustainability of Competitive Advantage. *Management Science* , 1504-1511.

Eden, C., & Huxham, C. (1996). Action research for the study of organizations. In S. R. Clegg, C. Hardy, & W. R. Nord, *Handbook of organization studies* (pp. 526-542). London, UK.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: what are they? *Strategic Management Journal, Vol. 21* , 1105-1121.

Elshazly, T. A. (1999). Quality and Profits: Seven Lessons from the Accounting Field. *Business and Economic Review, Jan-Mar* , 21-24.

Engeström, Y. (1987). *Learning by expanding: an activity theoretical approach to developmental research.* Helsinki.

Faulkner, D., & Bowman, C. (1992). Generic Strategies and Congruent Organisational Structures: Some Suggestions. *European Management Journal* , 494-499.

Fleck, A. (1994). *Hybride Wettbewerbsstrategien: Zur Synthese von Kosten- und Differenzierungsvorteilen.* Wiesbaden.

Garud, R., & Kumaraswamy, A. (1995). Technological and organizational designs for realizing economies of substitution. *Strategic Management Journal* , 93-109.

Ghemawat, P. (2006). *Strategy and the Business Landscape.* Upper Saddle River, NJ.

Gibson, B. C., & Birkinshaw, J. (2006). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal, Vol. 47* , 209-226.

Gilbert, X., & Strebel, P. (1985). Outpacing Strategies. *IMEDE – Perspectives for Managers, No. 2* .

Ginsberg, A. (1994). Minding the competition: From mapping to mastery. *Strategic Management Journal, Vol. 15* , 153-174.

Godfrey, P. C., & Hill, C. W. (1995). The problem of unobservables in strategic management research. *Strategic Management Journal, Vol. 16* , 519-533.

Gupta, A. K., & Singhal, A. (1993). Managing human resources for innovation and creativity. *Research Technology Management, Vol. 36* , 41-48.

Gupta, A. K., Smith, K. G., & Shalley, C. E. (2006). The interplay between exploration and exploitation. *Academy of Management Journal, Vol. 49, No. 4* , 693-706.

Hall, K. H. (1980). Survival strategies in a hostile environment. *Harvard Business Review, No. 5* , 75-85.

Hambrick, D. C. (1983). High Profit Strategies in Mature Capital Goods Industries: A Contingency Approach. *Academy of Management Journal, Vol. 26, No. 4* , 687-705.

Helfat, C. E., & Peteraf, M. A. (2003). The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal, Vol. 24* , 997-1010.

Hill, C. (1988). Differentiation Versus Low Cost or Differentiation and Low Cost: A Contingency Framework. *The Academy of Management Review Vol. 13* , 401-412.

Hitt, M. A., Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. (1996). The market for corporate control and firm innovation. *Academy of Management Journal, Vol. 39* , 1084-1119.

Hoskisson, R. E., & Hitt, M. A. (1990). Antecedents and performance outcomes of diversification: A review and critique of theoretical perspectives. *Journal of Management, Vol. 16* , 461-509.

Hoskisson, R. E., Hitt, M. A., Wan, W. P., & Yiu, D. (1999). Theory and research in strategic management: Swings of a pendulum. *Journal of Management, Vol. 25, No. 3* , 417-456.

Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. (1994). Corporate divestiture intensity in restructuring firms: Effects of governance, strategy, and performance. *Academy of Management Journal, Vol. 37* , 1207-1251.

Huffman, C., & Kahn, B. E. (1998). Variety for sale: mass customization or mass confusion? *Journal of retailing, Vol. 74, No. 4* , 491-513.

Jarzabkowski, P. (2005). *Strategy as Practice: An Activity Based Approach.* London, UK.

Jenner, T. (2000). Hybride Wettbewerbsstrategien in der deutschen Industrie – Bedeutung, Determinanten und Konsequenzen für die Marktbearbeitung. *Die Betriebswirtschaft, No. 60* , 7-22.

Jiao, J., Ma, Q., & Tseng, M. M. (2003). Towards high value-added products and services: mass customization and beyond. *Technovation, Vol. 23* , 809–821.

Johnson, G., & Huff, A. (1997). Everyday innovation/everady strategy. In G. Hamel, C. K. Prahalad, H. Thomas, & D. O'Neill, *Mapping Strategic Knowledge.* London, UK.

Johnson, G., Leif, M., & Whittington, R. (2003). Micro strategy and strategizing: Towards an activity-based view. *Journal of Management Studies, Vol. 1, No. 1* , 3-22.

Johnston, R., & Smith, S. S. (2010). How critical realism clarifies validity issues in theory-testing research: analysis and case. In D. N. Hart, & S. D. Gregor, *Information systems foundations: The Role of Design Science* (pp. 21-47). Canberra, AUS.

Jonassen, D. H., & Rohrer-Murphy, L. (1997). Activity theory as a framework for designing constructivist learning environments. *Educational Technology, Research and Development, Vol. 47, No. 1* , 61-79.

Jones, G., & Butler, J. (1988). Cost, Revenue, and Business-Level Strategy. *The Academy of Management Review Vol. 13* , 201-213.

Jönsson, S., & Lundin, R. (1977). Myths and wishful thinking as management tools. In P. C. Nystrom, & W. H. Starbucks, *Prescriptive models of organizations.* Amsterdam.

Juran, J. M. (1951). *Quality control handbook, first edition.* New York: McGraw-Hill.

Karnani, A. (1984). Generic competitive strategies - An analytical approach. *Strategic Management Journal, Vol. 5, No. 4* , 367–380.

Kim, E. N. (2004). Testing the applicability of Porter's generic strategies in the digital age: a study of Korean cyber malls. *Journal of Management, Vol. 21, No 1* , 569-589.

Kim, L., & Lim, Y. (1988). Environment, generic strategies, and performance in rapidly developing countries: A taxonomic approach. *Academy of Management Journal, Vol. 31, No. 4* , 802-827.

Kleinaltenkamp, M. (1987). Die Dynamisierung strategischer Marketing-Konzepte. *Zeitschrift für betriebswirtschaftliche Forschung, Vol. 39* , 31-52.

Kloock, J., & Sabel, H. (1993). Economies und Savings als grundlegende Konzepte der Erfahrung – Was bringt mehr? *Zeitschrift für Betriebswirtschaft, 63. Jg.* , 209-233.

Knyphausen, D. z., & Ringlstetter, M. (1991). Wettbewerbsumfeld, Hybride Strategien und Econoies of Scope. In W. Kirsch, *Beiträge zum Management strategischer Programme* (pp. 539-557). Herrsching.

Knyphausen, D. z., & Ringlstetter, M. (1991). Wettbewerbsumfeld, Hybride Strategien und Economies of Scope. In W. Kirsch, *Beiträge zum Management strategischer Programme* (pp. 539-557). Herrsching.

Kotha, S. (1995). Mass customization: Implementing the emerging paradigm for competitive advantage. *Strategic Management Journal, Vol. 16* , 21-42.

Kotha, S., & Orne, D. (1989). Generic Manufacturing Strategies: A Conceptual Synthesis. *Strategic Management Journal 1989* , 211-231.

Kotha, S., & Vadlamani, B. L. (1995). Assessing Generic Strategies: An Empirical Investigation of Two Competing Typologies in Discrete Manufacturing Industries, in:. *Strategic Management Journal, No.16* , 75-83.

Leana, C. R., & Barry, B. (2000). Stability and change as simultaneous experiences in organizational life. *The Academy of Management Review, Vol. 25* , 753-759 .

Leitner, K.-H., & Güldenberg, S. (2009). Generic strategies and firm performance in SMEs: a longitudinal study of Austrian SMEs. *Small Business Economics* , 169-189.

Leontov, A. N. (1978). *Activity, consciousness, and personality.*

Mahoney, J. T., & Pandian, J. R. (1992). The Resource-Based View Within the Conversation of Strategic Management. *Strategic Mangement Journal, Vol. 13* , 363-380.

Mahr, F. (2010). *Hybrid Strategy and Firm Performance: The moderating role of Individual and Technological Ambidexterity.* Munich.

Makadok, R. (2001). “Toward a synthesis of the resource-based and dynamic-capability views of rent creation”. *Strategic Management Journal, Vol. 22 No. 5* .

Makadok, R. (2001). Toward a synthesis of the resource-based and dynamic-capability views of rent creation. *Strategic Management Journal, Vol. 22, No. 5* , 387-401.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, Vol. 2* , 71-87.

Mazzola, P., & Kellermanns, F. W. (2010). *Handbook of Research on Strategy Process.* Northampton, MA.

McKee, D. O., Varadarajan, P. R., & Pride, W. M. (1989). Strategic adaptability and firm performance: a market-contingent perspective. *Journal of Marketing, Vol. 53* , 21-35.

Miles, R. E., & Snow, C. C. (1978). *Organizational Strategy, Structure, and Process.* New York: McGraw-Hill.

Miller, A., & Dess, G. G. (1993). Assessing Porter's (1980) Model in terms of its generalizability, accuracy and simplicity. *Journal of Management Studies, Vol. 30, No. 4* , 553-586.

Miller, D. (1992). Generic Strategies: Classification, Combination and Context. In P. Shrivastava, *Advances in Strategic Management* (pp. 391-408). Greenwich, Conneticut.

Miller, D. (1988). Relating Porter's Business Strategies to Environment and Structure: Analysis and Performance Implications. *Academy of Management Journal, No.2* , 280-308.

Miller, D. (1987). The Structural and Environmental Correlates of Business Strategy. *Strategic Management Journal, Vol. 8* , 55-76.

Miller, D., & Friesen, P. H. (1986). Porter's (1980) generic strategies and performance: An empirical examinisation with American data. Part I: Testing Porter. *Organizational Studies, Vol. 3* , 37-55.

Miller, J. G., & Vollmann, T. E. (1985). The hidden factory. *Harvard Business Review, Vol. 63, No. 5* , 142-150.

Miller, K. D. (2005). The problem of method and the practice of management research. In D. J. Ketchen, & D. D. Bergh, *Research Methodology in Strategy and Management* (pp. 143-177). Amsterdam, The Netherlands: Elsevier.

Mintzberg, H. (1978). Patterns in strategy formation. *Management Science, Vol. 24* , 934-949.

Mintzberg, H. (1973). *The Nature of Managerial Work.* New York.

Mintzberg, H., Ahlstrand, B., & Lampel, J. (1999). *Strategy Safari: A Guided Tour Through the Wilds of Strategic Management.* Vienna.

Mintzberg, H., Lample, J., Quinn, J. B., & Goshal, S. (2003). *The Strategy Process: Concepts, Contexts, Cases.* Harlow, UK.

Mintzberg, H., Raisinghani, O., & Theoret, A. (1976). The structure of unstructured decision processes. *Administrative Science Quarterly, Vol. 21* , 246-275.

Morschetta, D., Swobodab, B., & Schramm-Klein, H. (2006). Competitive strategies in retailing—an investigation of the applicability of Porter's framework for food retailers. *Journal of Retailing and Consumer Services, Vol. 13* , 275-287.

Murray, A. I. (1988). A Contingency View of Porter's Generic Strategies. *Academy of Management Review, Vol. 13* , 390-400.

Nardi, B. A. (1996). Studying context: A comparison of activity theory, situated action models, and distributed cognition. In B. A. Nardi, *Context and consciousness: Activity theory and human computer interaction.* Cambridge, MA.

Nardi, B. A. (1998). *Context and Consciousness: Activity Theory and Human-Computer Interaction.* Cambridge, MA.

Nelson, R. R. (1991). Why do firms differ and how does it matter? . *Strategic Management Journal, Vol. 12* , 61-74.

Orton, J. D., & Weick, K. E. (1990). Loosely Coupled Systems: A Reconceptualization. *Academy of Management Journal* , 203-223.

Parnell, J. A. (2000). Reframing the combination strategy debate: defining forms of combination. *Journal of Applied Management Studies, Vol. 9, No. 1* , 33-54.

Parnell, J. A. (1998). Performance's influence on strategic change: A longitudinal assessment. *Scandinavian Journal of Management, Vol. 14* , 19-36.

Pearce, J. A., & Robinson, R. B. (2005). *Formulation, Implmentation, and Control of Competitive Strategy.* Boston, MA.

Penrose, E. T. (1959). *The theory of the growth of the firm.* New York.

Pertusa-Ortega, E. M., Molina-Azurin, J. F., & Claver-Cortés, E. (2009). Competitive Strategies and Firm a Comparative Analysis of Pure, Hybrid and 'Stuck-in-the-middle' Strategies in Spanish Firms. *British Journal of Management, Vol. 20, No. 4* , 508-523.

Peteraf, M. (1993). The Cornerstones of Competitive Advantage: A Resource-Based View. *Strategic Management Journal, Vol. 14* , 179-191.

Pettigrew, A. M. (1977). Strategy formulation as a political process. *International Studies of Management and Organization , Vol. 7, No. 2* , 78-87.

Phillips, L., Chang, D., & Buzzel, R. (1983). Product Quality, Cost Position and Business Performance: A Test of Some Key Hypotheses. *Journal of Marketing Vol. 47* , 26-43.

Porter, M. E. (1980). *Competitive Strategy.* New York.

Porter, M. E. (1985). How Information Gives You Competitive Advantage. *Harvard Business Manager, July-August* .

Porter, M. E. (1991). Towards a Dynamic Theory of Strategy. *Strategic Management Journal, Vol. 12* , 95-117.

Priem, R. L., & Butler, J. E. (2001). Is the resource-based 'view' a useful perspective for strategic management research? *Academy of Management Review, Vol. 26 No. 1* , 22-40.

Proff, H. (2000). Hybrid strategies as a strategic challenge — the case of the German automotive industry. *Omega, Vol. 28, No. 5* , 541-553.

Proff, H., & Proff, H. V. (1997). Möglichkeiten und Grenzen hybrider Strategien. *Die Betriebswirtschaft, No. 6* , 796-809.

Raisch, S., & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes, and moderators. *Journal of Management, Vol. 34, No. 3* , 375-409.

Ray, G., Barney, J., & Muhanna, W. (2004). Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical tests of the resource-based view. *Strategic Management Journal, Vol. 25 No. 1* , 23-38.

Reitsperger, W. D., Daniel, S. J., Tallman, S. B., & Chismar, W. G. (1993). Product Quality and Cost Leadership: Compatible Strategies. *Management International Review, No. 1* , 7-21.

Robinson, R. J., & Pearce, J. I. (1988). Planned Patterns of Strategic Behavior and Their Relationship to Business Unit Performance. *Strategic Management Journal, No.9* , 43-60.

Roth, K., & Morrison, A. J. (1992). Implementing global strategy: Characteristics of global subsidiary mandates. *Journal of International Business Studies, Vol. 23, No. 4* , 715-735.

Rumelt, R. P. (1991). How much does industry matter? *Strategic Management Journal, Vol. 12* , 167-185.

Rumelt, R. P. (1984). Toward a strategic theory of the firm. In R. Lamb, *Competitive strategic management* (pp. 556-570). Englewood Cliffs: NJ.

Sanchez, R. (1995). Strategic flexibility in product competition. *Strategic Management Journal, Vol. 16* , 135-159.

Sanchez, R., & Mahoney, J. (1996). Modularity, flexibility, and knowledge management in product and organization desig. *Strategic Management Journal, Vol. 17* , 63-76.

Selznick, P. (1957). *Leadership in Administration.* New York.

Sheehan, N., & Foss, N. (2007). Enhancing the prescriptiveness of the resource-based view through Porterian activity analysis. *Management Decision Vol. 45, No. 3* , 450-461.

Simon, H. A. (1991). Bounded rationality and organizational learning. *Organization Science, Vol. 2* , 125-134.

Simsek, Z., Heavey, C., Veiga, J. F., & Souder, D. (2009). A typology for aligning organizational ambidexterity's conceptualizations, antecedents, and outcomes. *Journal of Management Studies, Vol. 46, No. 5* , 864-894.

Snow, C. C., & Hrebiniak, L. G. (1980). Strategy, distinctive competence, and organizational performance. *Administrative Science Quarterly, Vol. 25* , 317-336.

Sommerlatte, T., & Mollenhauer, M. (1992). Qualität-Kosten-Zeit-das magische Dreieck. In A. Little, *Das Management von Spitzenqualität* (pp. 26-30). Wiesbaden.

Spanos, Y. E., Zaralis, G., & Spyros, L. (2004). Strategy and industry effects on profitability: Evidence from greece. *Strategic Management Journal, Vol. 25* , 139-165.

Spender, J. C. (1994). Organizational knowledge, collective practice, and Penrose rents. *International Business Review, Vol. 3* , 353-367.

Stalk, G., Evans, P., & Shulman, L. (1992). Competing on capabilities: the new rules of corporate strategy. *Harvard Business Review, Vol. 70, No.2* , 57-69.

Starr, M. K. (1992). Accelerating Innovation. *Business Horizon, Vol. 35, No. 4* , 44-51.

Teece, D. J. (2009). *Dynamic Capabilities and Strategic Management: Organizing for Innovation and Growth.* Oxford.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal, Vol. 18, No. 7* , 509-533.

Turner, T. E. (1969). An economic look at quality. *Quality Progress, Vol. 2, No. 4* , 16-20.

Venkatraman, N., & Camillus, J. (1984). Exploring the concept of fit in strategic management. *Academy of Management Review, No. 9* , 513-525.

Vygotzki, L. (1978). *Mind in society.* Cambridge, MA.

Wang, C. L., & Ahmed, P. K. (2007). Dynamic capabilities: a review and research agenda. *International Journal of Management Reviews, Vol. 9* , 31-51.

Wernerfelt, B. (1984). A Resource-Based View of the Firm: Ten Years After. *Strategic Management Journal, Vol. 16, No.2* , 171-180.

White, R. (1986). Generic Business Strategies, Organizational Context and Performance: An Empirical Investigation. *Strategic Management Journal, Vol. 7* , 217-231.

Williamson, O. E. (1979). Transaction-cost economics: The governance of contractual relations. *Journal ol Law and Economics, Vol. 22* , 233-261.

Willig, R. D. (1979). Multiproduct technology and market structure. *The American Economic Review, Vol. 69, No. 2* , 346-351.

Wright, P. (1987). A Refinement of Porter's Strategies. *Strategic Management Journal* , 93-101.

Wright, P., & Parsinia, A. (1988). Porter's Synthesis of Generic Business Strategies: A Critique. *Industrial Management, No.3* , 20-23.

Wright, P., Kroll, M., Pray, B., & Lado, A. (1995). Strategic Orientations, Competitive Advantage, and Business Performance. *Journal of Business Research, Vol.33* , 143-151.

Wright, P., Kroll, M., Tu, H., & Helms, M. (1991). Generic Strategies and Business Performance: An Empirical Study of the Screw Machine Products Industry. *British Journal of Management* , 57-65.

Yamin, S., Gunasekaran, A., & Mavondo, F. T. (1999). Relationship Between Generic Strategies, Competitive Advantage and Organizational Performance: An Empirical Analysis. *Technovation, Vol. 19* , 507-518.

Zajac, E. J., & Shortell, S. M. (1989). Changing Generic Strategies: Likelihood, Direction, and Performance Implications. *Strategic Management Journal, Vol.10* , 413-430.

Zott, C., & Amit, R. (2010). Business Modell Design: An activity system perspective. *Long Range Planning, Vol. 43* , 216-226.

Works Cited

Aaker, D. A., & Jacobson, R. (1994). The Financial Information Content of Perceived Quality. *Journal of Marketing Research, 31(2)* , 191–201.

Abbott, L. (1955). *Qualify and competition.* New York: Columbia University Press.

Abell, D. F. (1980). *Defining the business: The starting point of strategic planning.* Englewood Cliffs.

Abell, D. F. (1978). Strategic windows. *The Journal of Marketing* , 21-26.

Acquaah, M., & Yasai-Ardekani, M. (2008). Does the implementation of a combination competitive strategy yield incremental performance benefits? A new perspective from a transition economy in Sub-Saharan Africa. *Journal of Business Research Vol. 61* , 346–354.

Adams, G., & White, J. (1994). Dissertation research in pbulic administration and cognate fields: an assessment of methods and quality. *Public Administration Review, Vol. 54, No. 6* , 565-576.

Adcroft, A., & Willis, R. (2008). A snapshot of strategy research 2002-2006. *Journal of Management History, Vol. 14, No. 4* , 313-333.

Adner, R., & Zemsky, P. A. (2006). A demand-based perspective on sustainable competitive advatnage. *Strategic Management Journal, Vol. 27* , 215-239.

Ahire, S. L., & Dreyfus, P. (2000). The impact of design management and process management on quality: an empirical investigation. *Journal of Operations Management, 18(5)* , 549-575.

Ahlström, P., & Westbrook, R. (1999). Implications of mass customization for operations management: an exploratory survey. *International Journal of Operations and Production Management, 19* , 262-274.

Akao, Y. (1990). *Quality function deployment: integrating customer requirements into product design.* Productivity Press.

Alchian, A., & Demsetz, H. (1972). Production, Information Costs, and Economic Organization. *American Economic Review, Vol. 62* , 777-795.

Ali, A. A., Krapfel, R., & Labahn, D. (1995). Product innovativeness and entry strategy: Impact on cycle time and break-even time. *Journal of Product Innovation Management, 12* , 54-69.

Allen, R. S., & Helms, M. M. (2006). Linking strategic practices and organizational performance to Porter's generic strategies. *Business Process Management* , 433-454.

Allen, T. J., Lee, D. M., & Tushman, M. L. (1980). R&D performance as a function of internal communication, project management, and the nature of the work. *IEEE Transactions on Engineering Management. 27* , 2-12.

Alvesson, M. (2003). Beyond neopositivists, romantics, and localists: A reflexive approach to interviews in organizational research. *Academy of management review, Vol. 28, No. 1* , 13-33.

Amit, R., & Schoemaker, P. J. (1993). Strategic assets and organizational rent. *Strategic Management Journal, Vol. 14* , 33-46.

Ancona, D. G., & Caldwell, D. (1990). Improving the performance of new product teams. *Research Technology Management, 33* , 25-29.

Anderson, D. M. (2003). *Build-to-Order and Mass Customisation .* Cambria: CIM Press.

Anderson, E. W. (1994). Cross-category variation in customer satisfaction and retention. *Marketing letters, Vol. 5, No. 1* , 19-3.

Anderson, E. W., & Sullivan, M. W. (1993). The Antecedents and Consequences of Customer Satisfaction. *Marketing Science 12 (Spring)* , 125-143.

Anderson, E. W., Fornell, C., & Lehmann, R. (1994). Customer Satisfaction, Market Share, and Profitability. *Journal of Marketing, 58(3)* , 53–66.

Anderson, E., & Fornell, C. (1993). A customer satisfaction research prospectus. In R. Oliver, & R. Rust, *Frontiers in service marketing.* Newbury Park, CA.

Anderson, P., & Tushman, M. (2001). Organizational Environments and Industry Exit: The effects of uncertainty, munificence and complexity. *Industrial and Corporate Change, Vol. 10* , 675-711.

Anderson111, E. W. (1994). Cross-Category Variation in Customer Satisfaction and Retention. *Marketing Letters, 5(1)* , 19–30.

Andrews, K. (1971). *The concepts of corporate strategy.* Homewood, IL.

Ansoff, I. H. (1957). A model for diversification. *Management Science* , 392-414.

Ansoff, I. H. (1984). *Implanting Strategic Management.* Englewood Cliffs, NJ.

Ashby, W. R. (1956). *An Introduction to Cybernetics.* New York.

Bain, J. (1956). *Barriers to New Competition.* Cambridge .

Bain, J. (1968). *Industrial Organisation (2nd edition).* New York.

Baldwin, C. Y., & Clark, K. B. (2000). *Design Rules: The power of modularity.* Boston, MA.

Banburry, C. M., & Mitchell, W. (1995). The effect of introducing important incremental innovations on market share and business survival. *Strategic Management Journal, Vol. 16* , 161-182.

Bandara, W. (2006). Using NVivo as a research management tool: a case narrative. *Quality and Impact of Qualitative Research* , 6-19.

Banker, R. D., Datar, S. M., & Kemerer, C. F. (1993). Software complexity and maintenance costs. *Communications of the ACM* , 81-94.

Barnard, C. I. (1938). *The functions of the executive.* Cambridge, MA.

Barney, J. B. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Marketing, Vol. 1* , 99-120.

Barney, J. B. (1986). Organizational culture: Can it be a source of sustained competitive advantage? *Academy of Management Review, Vol. 11* , 656-665.

Barney, J. B. (1986). Strategic Factor Markets: Expectations, Luck and Business Strategy. *Mangement Science, Vol. 32, No. 10* , 1231-1241.

Barney, J. B. (1986). Types of Competition and the Theory of Strategy: Toward an Integrative Framework. *Academy of Management Review* , 791-800.

Barney, J. (2001). Is the resource-based 'view' a useful perspective for strategic management research? Yes. *Academy of Management Review, Vol. 26, No. 1* , 41-56.

Barron, D., N. West, E., & Hannan, M. T. (1994). A Time to Grow and a Time to Die: Growth and Mortality of Credit Unions in New York City, 1914-1990. *American Journal of Sociology, Vol. 100* , 196- 241.

Barry, C. A. (1998). Choosing qulitative data analysis software: Atlas/ti and NUD.IST compared. *Sociological Research Online, 3(3)* .

Beal, R. M., & Yasai-Ardekani, M. (2000). Performance Implications of Aligning CEO Functional Expe-rience with Competitive Strategies. *Journal of Management, No.4* , 733-762.

Beal99, R., & Yasai-Ardekani, M. (2000). Performance Implications of Aligning CEO Functional Expe-rience with Competitive Strategies. *Journal of Management, No.4* , 733-762.

Belohlav, J. (1993). Quality, Strategy and Competitiveness. *California Management Review, Vol. 35, No. 3* , 55-67.

Berg, B. L. (2001). *Qualitative research methods for the social sciences.* Boston, MA: Allyn & Bacon.

Berman, B. (2002). Should your firm adopt a mass customization strategy? *Business Horizons, 45(4)* , 51-60.

Bharadwaj, S. G., Varadarajan, P. R., & Fahy, J. (1993). Sustainable competitive advantage in service industries: A conceptual model and research proposition. *Journal of Marketing, Vol. 57* , 83-99.

Bhaskar, R. (2008). *A Realist Theory of Science (2nd edn).* London: Verso.

Bhaskar, R. (1998). *The Possibility of Naturalism: A Philosophical Critique of the Contemporary Human Sciences (3rd edn).* Lonkon: Routledge.

Bhaskar99, R. (1998). *The Possibility of Naturalism: A Philosophical Critique of the Contemporary Human Sciences.* London, UK.

Birnbaum-More, P. H. (1993). *New product deveJopmenf time: A cross-national study.* Center for Innovation Management Studies, Lehigh University, Bethlehem, PA.

Black, J. A., & Boal, K. .. (1995). Strategic resources: Traits, configurations and paths to sustainable competitive advantage. *Strategic Managemetn Journal, Vol. 15* , 131-148.

Blackler, F. (2000). Organizing processes in complex activity networks. *Organization, Vol. 7* , 277-300.

Blattberg, R., & Glazer, R. (2000). Marketing in the Information Revolution. In R. B. al., *The Marketing Information Revolution* (pp. 9-29). Boston: Harvard Business School Press.

Bock, W. J. (1973). Philosophical foundations of classical evolutionary classification. *Systematic Zoology* , 375-392.

Bogner, W., & Thomas, H. (1996). From skills to competences: The 'play-out' of resource-bundles across firms. In R. Sanchez, A. Heene, & H. Thomas, *Dynamics of competenc-based competitioin.* Oxford.

Bohn, A. (1993). *Differenzierungsstrategien – Kritische Würdigung eines zentralen Konzeptes der strategischen Unternehmensführung.* München.

Bongartz, U. (1997). Strategische Ressourcen und erhaltbare Wettbewerbsvorteile. *Zeitschrift für Betriebswirtschaft, Ergänzungsheft 1/97* , 21-43.

Booth, M. E., & Philip, G. (1998). Technology, competencies, and competitiveness: The case for reconfigurable and flexible strategies. *Journal of Business Research, Vol. 41* , 29-40.

Botschen, G., Thelen, E. M., & Pieters, R. (1999). Using means-end structures for benefit segmentation an application to services. *European Journal of Marketing, 33 (1-2)* , 38-58.

Bower, J. L. (1970). *Managing the resource allocation process.* Boston: Harvard University Press.

Bowman, C., & Ambrosini, V. (1997). Perceptions of strategic priorities, consensus, and firm performance. *Journal of Management Studies, Vol. 34* , 241-258.

Bowman, C., & Ambrosini, V. (2000). Value Creation Versus Value Capture: Towards a Coherent Definition of Value in Strategy. *British Journal of Management, Vol. 11, Issue 1* , 1-15.

Boyd, R. (1991). Observations, explanatory power, and simplicity: Towards a non-Humean account . In R. Boyd, Gasper, P., & J. D. Trout, *The Philosophy of Science* (pp. 349-378). Cambridge, MA.

Boynton, A. C., Victor, B., & Pine, I. I. (1993). New competitive strategies: challenges to organizations and information technology. *IBM systems journal, 32(1)* , 40-64.

Brentani, U. (2001). Innovative versus incremental new business services: different keys for achieving success. *Journal of Product Innovation Management, 18(3)* , 169-187.

Bresnahan, T. F. (1989). Empirical Studies of Industries with Market Power. In R. Schmalensee, & R. D. Willig, *Handbook of Industrial Organization, Volume 2* (pp. 1011-1057). Amsterdam.

Bright, D. S., Powley, E. H., Fry, R., & Barrett, F. (2011). The generative potential of cynical conversations. In D. Zandee, D. Cooperrider, & M. Avital, *Generative Organization: Advances in Appreciative Inquiry, Vol. 4.* Bingley, England: Emerald Publishing.

Brown, P. G. (1991). QFD: echoing the voice of the customer. *At&T Technical Journal, 70(2)* , 18-32.

Brown, S. L., & Eisenhardt, K. M. (1995). Product development: Past research, present findings, and future directions. *Academy of Management Review, 20* , 343-378.

Brown, W. B., & Karagozoglu, N. (1993). Leading the way to faster new product development. *Academy of Management Executive, 7(1)* , 36-47.

Bruderl, J., & Schussler, R. (1990). Organizational Mortality: the liabilities of newness and adolescence. , 187-218. *Administrative Science Quarterly, Vol. 36* , 187-218.

Bühner, R. (1977). Messung des Erfolgs von Organisationen unter Berücksichtigung situativer Einflußfaktoren. *Management International Review, Vol. 17, No. 3* , 51-59.

Burkart, E. E. (1994). Reducing R&D cycle time. *Research Technology Management. 37(3)* , 27-31.

Bushe, G. R. (2011). Appreciative inquiry: Theory and critique. *The Routledge companion to organizational change* , 87-102.

Buzzel, R. D., & Wiersema, F. D. (1981). Erfolgsstrategien im Kampf um Marktanteile. *Harvard Business Manager, No. 4,* , 7-18.

Buzzel, R. D., Gale, B. T., & Sultan, R. (1975). Market Share: A Key to Profitability. *Harvard Business Reviews, Vol. 53, No.1* .

Buzzell, R. D., & Gale, B. T. (1989). *Das PIMS-Programm.* Gabler.

Calori, R., Johnson, G., & Sarnin, P. (1994). CEOs' cognitive maps and the scope of the organization. *Strategic Management Journal, Vol. 15, No. 6* , 427-457.

Campbell, D. T. (1975). Degrees of freedom and the case study. *Comparative Political Studies, Vol. 8* , 178-193.

Campbell-Hunt, C. (2000). What Have We Learned About Generic Competitive Strategy? A Meta-Analysis. *Strategic Management Journal, No. 21* , 127-154.

Carmel, E. (1995). Cycle time in packaged software firms. *Journal of Product Innovation Management, 12(2)* , 110-123.

Carson, D., Gilmore, A., Perry, C., & Gronhaug, K. (2001). *Qualitative marketing research.* London: Sage.

Carter, B., & New, C. (2004). Introduction: realist social theory and empirical research. In B. Carter, & C. New, *Making Realism Work: Realist Social Theory and Empirical Research* (pp. 1-20). London, UK.

Cavusoglu, H., Cavusoglu, H., & Raghunathan, S. (2007). Selecting a customization strategy under competition: mass customization, targeted mass customization, and product proliferation. *Engineering Management, IEEE Transactions on, 54(1)* , 12-28.

Chakrabarti, A. K. (1974). The role of champions in product innovation. *California Managrement Review, 17(2)* , 58-62.

Chakrabarti, A. K., & Hauschild, J. (1989). The division of labour in innovation management. *R&D Management, 19* , 161-17.

Chakrabarti, A. K., & Rubenstein, A. H. (1976). Inter-organizational transfer of technology: A study of adoption of NASA innovations. *IEEE Transactions on Engineering Management. 23* , 20-34.

Chamberlin, E. (1933). *The Theory of Monopolistic Competition.* Cambridge.

Chandler, A. D. (1992). Organizational capabilities and the economic history of the industrial enterprise. *The Journal of Economic Perspectives, 6(3)* , 79-100.

Chandler, A. D. (1990). *Scale and scope.* Belknap Press of Harvard University Press.

Chandler, A. D. (1962). *Strategy and Structure: Chapters in the History of American Industrial Enterprise.* Cambridge .

Chandler, A. D. (1977). *The visible hand: The managerial revolution in American business.* Harvard University Press.

Child, P., Diederichs, R., Sanders, F. H., & Wisniowski, S. (1991). The management of complexity. *Sloan Management Review, Vol. 33, No. 1* , 73-80.

Chmielewski, D. A., & Paladino, A. (2007). Driving a resource orientation: reviewing the role of resource and capability characteristics. *Strategic Management Journal, Vol. 45, No. 3* , 462-483.

Chowdhury, S. (2005). *The Ice Cream Maker: An Inspiring Tale About Making Quality The Key Ingredient in Everything You Do.* New York, NY: Doubleday, Random House.

Chrisman, J. J., Hofer, C. W., & Boulton, W. R. (1988). Toward a System for Classifying Business Strategies. *Toward a System for Classifying Business Strategies, in: Academy of Management Review* , 413-428.

Christensen, C. R., Andrews, K. R., Bower, J. L., & Learned, E. P. (1969). *Business policy: Text and cases.* Homewood, Ill.

Churchill, G. A., & Suprenant, C. (1982). An Investigation into the Determinants of Customer Satisfaction. *Journal of Marketing Research 19 (November)* , 491-504.

Clark, K. (1989). What strategy can do ior technology. *Harvard Business Review, 67(6)* , 94-98.

Clark, K., & Fujimoto, T. (1991). *Product development performance.* Boston: Harvard Business School Press.

Claver-Cortés, E., Pertusa-Ortega, E. M., & Molina-Azorín, J. F. (2011). Characteristics of organizational structure relating to hybrid competitive strategy: Implications for performance. *Journal of Business Research* , doi:10.1016/j.jbusres.2011.04.012.

Coase, R. H. (1937). The Nature of the Firm. *Economica* , 386-405.

Cockburn, I. M., Henderson, R. M., & Stern, S. (2000). Untangling the origins of competitive advantage. *Strategic Management Journal, Vol. 21 No. 10* , 1123-1145.

Cohen, S., Teece, D. J., Tyson, L., & Zysman, J. (1984). *Global competition: the new reality. President's Commission on Industrial Competitiveness.* Washington DC: Government Printing Office.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning an innovation. *Administrative Science Quarterly, Vol. 35* , 128-152.

Cole, R. E. (1992). The quality revolution. *Production and Operations Management, 1(1)* , 118-120.

Collier, D., & Mahoney, J. (1996). Insights and Pitfalls. *World Politics, 49 (1)* , 56-91.

Comstock, M., Johansen, K., & Winroth, M. (2004). From mass production to mass customization: enabling perspectives from the Swedish mobile telephone industry. *Production Planning and Control, 15(4)* , 362-372.

Connor, T. (1999). Customer-led and market-oriented: a matter of balance. *Strategic Management Journal 20* , 1157-1163.

Cook, T. D., & Campbell, D. T. (1979). *Quasi-Experimentation: Design & analysis issues for field settings.* Houghton Mifflin, New York.

Cooper, A. C., & Schendel, D. (1976). Strategic responses to technological threats. *Business Horizons, February* , 61-69.

Cooper, R. G. (1986). *Winning at new products.* Reading, MA: Addison-Wesley.

Cooper, R. G., & Kleinschmidt, E. J. (1987). New products: What separates winners from losers? *Journal of Product Innovation Management, 4* , 169-184.

Cooperrider, D. L. (1990). Positive image, positive action: the affirmative basis of organizing. In S. S., & D. L. Cooperrider, *Appreciative management and leadership: The power of positive thought and action in orgnaizations.* San Francisco, CA.

Cordero, R. (1991). Managing for speed to avoid product obsolescence: a survey of techniques. *Journal of Product Innovation Management, 8(4)* , 283-294.

Coyne, K. P. (1986). Sustainable competitive advantage: what is it, what it isn't. *Business Horizons, Vol. 29, No. 1* , 54-61.

Crawford, C. M. (1992). The hidden costs of accelerated product development. *JournaJ of Product innovation Managemenf, 9* , 188-199.

Cristiano, J. J., Liker, J. K., & White, C. C. (2000). Customer-Driven Product Development Through Quality Function Deployment in the US and Japan. *Journal of Product Innovation Management, 17(4)* , 286-308.

Crosby, P. (1979). *Quality is Free.* New York: McGraw-Hill.

Cusumano, M. (1991). *Japan's software factories: A challenge to US management.* New York.

Cusumano, M., & Nobeoka, K. (1998). *Thinking beyond lean: how multi-project management is transforming product development at Toyota and other companies.* Simon and Schuster.

D´Aspremont, C., & Jacquemin, A. (1988). Co-operative and non-cooperative R&D in duopoly with spillovers. *American Economic Review 78* , 133-1137.

Damanpour, F. (1991). Organizational innovation: A meta-analysis of effects of determinants and moderators. *Academy of Management Journal, 34* , 555-590.

Danermark, B., Ekström, M., Jakobsen, L., & Karlsson, J. C. (2002). *Explaining Society: Critical Realism in the Social Sciences.* London, UK.

DaSilveira, G., Borenstein, D., & Fogliatto, F. S. (2001). Mass customization: Literature review and research directions. *International journal of production economics, 72(1)* , 1-13.

Davenport, T. (2005). The coming commoditization of processes. *Harvard Business Review, Vol. 74* , 100-108.

Davis, S. M. (1987). *Future perfect.* Reading, MA: Addison-Wesley.

Day, G. S., & Montgomery, D. B. (1982). Diagnosing the experience curve. *The Journal of Marketing* , 44-58.

Day, G., & Wensley, R. (1988). Assessing advantage: A framework for diagnosing competitive superiority. *Journal of Marketing, Vol. 52, No. 2* , 1-20.

Dean, J. W., & Bowen, D. E. (1994). Management theory and total quality: improving research and practice through theory development. *Academy of management review, 19(3)* , 392-418.

Dean, J. W., & Susman, G. I. (1989). Organizing for manufacturable design. *Harvard Business Review, 67(1)* , 28-36.

DeBresson, C., & Amese, F. (1991). Networks of innovators: A review and introduction to the issue. *Research Policy 20* , 363-379.

DeCastro, J., & Chrisman, J. J. (1995). Order of Market Entry, Competitive Strategy, and Financial Performance. *Journal of Business Research, Vol. 33* , 165-177.

Deming, W. E. (1986). *Out of the crisis.* Cambridge, MA: Massachusetts Institute of Technology.

DeNardo, A. M., & Levers, L. L. (2002). *Using NVivo to Analyze Qualitative Data.* Retrieved 03 24, 2014, from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.83.5090&rep=rep1&type=pdf

Denzin, N. K., & Lincoln, Y. S. (1994). Entering the field of qualitative research. In N. K. Denzin, & Y. S. Lincoln, *Handbook of qualitative research* (pp. 1-18). Thousand Oaks, CA.

Deschamps, J. P., & Nayak, P. R. (1995). *Product juggernauts: How companies mobilize to generate a stream of market winners.* Harvard Business School Press.

Desphande, R. (1983). Paradigms lost: on theory and method in research in marketing. *Journal of Marketing, Vol. 47* , 101-110.

Dess, G. G., & Davis, P. S. (1984). Porter's (1980) generic strategies as determinants of strategic group membership and organizational performance . *Academy of Management Journal, Vol. 27* , 467–488.

Dess, G. G., & Rasheed, A. M. (1992). Commentary: Generic strategies: classification, combination and context (D. Miller). *Advances in Strategic Management* , 409-416.

Dess, G. G., & Robinson, R. (1984). Measuring Organzational Performance in the Absence of Objective Measures: The Case of the Privately-held Firma and Conglomerate Business Unit. *Strategic Management Journal, Vol.5* , 265-273.

Detert, J. R., Schroeder, R. G., & Mauriel, J. J. (2000). A framework for linking culture and improvement initiatives in organizations. *Academy of management Review, 25(4)* , 850-863.

Devaraj, S., Matta, K. F., & Conlon, E. (2001). Product and service quality: the antecedents of customer loyalty in the automotive industry. *Production and Operations Management, 10(4)* , 424-439.

Dick, B. (1990). *Convergent Interviewing.* Brisbane, Australia.

Dickson, P. R., & Ginter, J. L. (1987). Market Segmentation, Product Differentiation, and Marketing Strategy. *Journal of Management, Vol. 4* , 1-10.

Dierickx, I., & Cool, K. (1989). Asset Stock Accumulation and Sustainability of Competitive Advantage. *Management Science* , 1504-1511.

Dietrich, A. J., Timm, I. J., & Kirn, S. (2003). Implications of mass customization on business information systems. *MCPC 2003, Proceedings of the 2003 World Congress on Mass Customization and Personalization.* Technische Universitaet Muenchen.

Diller, H. (1988). Die Preis-Qualitäts-Relation von Konsumgütern im 10-Jahresvergleich. *Die Betriebswirtschaft* , 195-200.

Dobson, P., Myles, J., & Jackson, P. (2007). Making the Case for Critical Realism: Examining the Implementation of Automated Performance Management Systems. *Information Resources Management Journal* , 138-152.

Dodgson, M. (1993). *Technological Collaboration in Industry.* London: Routledge.

Donovan, S. S. (1994). It's people who get new products to market faster. *Research Technology Management, 37(5)* , 12-13.

Dosi, G. (1982). Technological paradigms and technological trajectories: A suggested interpretation of the determinants and directions of technological change. *Research Policy, 11* , 147-162.

Downard, P., Finch, J. H., & Ramsay, J. (2002). Critical realism, empirical methods and inference: a critical discussion. *Cambridge Journal of Economics, Vol. 26* , 481-500.

Downward, P., Finch, J. H., & Ramsay, J. (2002). Critical realism, empirical methods and inference: a critical discussion. *Cambridge Journal of Economics, Vol. 26* , 481-500.

Doz, Y. L. (1996). The evolution of cooperation in strategic alliances: Initial conditions or learning processes? . *Strategic Management Journal, Vol. 17* , 55-84.

Drucker, P. (1985). *Innovation and entrepreneurship.* Harper & Row.

Duhem, P. (1954). *The aim and structure of physical theory.* Princeton, NJ.

Dumaine, B. (1989). How managers can succeed through speed. *Fortune, February 13* , 54-59.

Dunst, K. H. (1983). *Portfolio-Mangement – Konzeption für die strategische Unternehmensplanung, 2. Auflage.* Berlin.

Dutton, I. E., & Duncan, R. B. (1987). The influence of the strategic planning process on strategic change. *Strategic Management Journal, 8* , 103-116.

Easterby-Smith, M., Thorpe, R., & Lowe, A. (1991). *Management Research. An Introduction.* London.

Easton, G. (2010). Critical realism in case study research. *Industrial Marketing Management, Vol. 39* , 118-128.

Eden, C., & Huxham, C. (1996). Action research for the study of organizations. In S. R. Clegg, C. Hardy, & W. R. Nord, *Handbook of organization studies* (pp. 526-542). London, UK.

Egan, T., & Lancaster, C. (2005). Comparing appreciative inquiry to action research: OD practitioner perspectives. *Organization Development Journal, 23 (2)* , 29-49.

Einav, L., & Levin, J. (2010). Empirical Industrial Organization: A Progress Report. *Journal of Economic Perspectives, Vol. 24, No. 2* , 145-162.

Eisenhardt, K. M. (1991). Better stories and better constructs: the case for rigor and comparative logic. *Academy of Management Review, Vol. 16, No. 3* , 620-627.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review* , 532-550.

Eisenhardt, K. M. (1989). Making fast strategic decisions in high velocity environments. *Academy of Management Journal, 32* , 543-576.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: what are they? *Strategic Management Journal, Vol. 21* , 1105-1121.

Elliot, C. (1999). *Locating the energy for change: An introduction to appreciative inquiry.* Winnipeg: International Institute for Sustainable Development.

Elshazly, T. A. (1999). Quality and Profits: Seven Lessons from the Accounting Field. *Business and Economic Review, Jan-Mar* , 21-24.

Emmanuelides, A. P. (1991). Determinants of product development time: A framework for analysis. *Academy of Management Best Paper Proceedings* , 342-346.

Engeström, Y. (1987). *Learning by expanding: an activity theoretical approach to developmental research.* Helsinki.

Etzioni, A. (1964). *Modern Organizations.* New Jersey.

Farris, G. F. (1982). The technical supervisor: Beyond the Peter principle. In M. L. Tushman, & W. L. Moore, *Readings in the management of innovation* (pp. 337-348). Boston: Pitman.

Faulkner, D., & Bowman, C. (1992). Generic Strategies and Congruent Organisational Structures: Some Suggestions. *European Management Journal* , 494-499.

Feigenbaum, A. V. (1951). *Quality control: Principles, practice, and administration.* New York, NY: McGraw-Hill.

Fine, C. H. (1986). Quality improvements and learning in productive systems. *Management Science, 32* , 1301-1315.

Firestone, W. (1993). Alternative arguments for generalizing from data as applied to qualitative research. *Educational Researcher, Vol. 22 No. 4* , 16-23.

Fisher, J. (1995). Use of nonfinancial performance measures. In S. M. Young, *Readings in management accounting* (pp. 329–33). Englewood Cliffs, NJ: Prentice Hall.

Fleck, A. (1994). *Hybride Wettbewerbsstrategien: Zur Synthese von Kosten- und Differenzierungsvorteilen.* Wiesbaden.

Flynn, B. B., Schroeder, R. G., & Sakakibara, S. (1994). A framework for quality management research and an associated measurement instrument. *Journal of Operations management, 11(4)* , 339-366.

Fornell, C. (1992). A National Customer Satisfaction Barometer: The Swedish Experience. *Journal of Marketing, 56(1)* , 6–21.

Fortune, A., & Mitchell, W. (2012). Unpacking firm exit as the firm and industry level: The adaptation and selection of firm capabilities. *Strategic Management Journal, Vol. 33* , 794-819.

Franke, N., & Piller, F. T. (2003). Key research issues in user interaction with user toolkits in a mass customisation system. *International Journal of Technology Management, 26(5)* , 578-599.

Friedman, M. (1953). *Essays in Positive Economics.* Chicago, IL.

Fritz, W. (1994). *Die Produktqualität: Ein Schlüsselfaktor des Unternehmenserfolgs?* Braunschweig: Technische Universität Braunschweig.

Frost & Sullivan. (2013, 11 12). *Professional Cameras Market Slowly Hobbles with 2K and 4K, while Large Vendors Struggle with Revenue*. Retrieved 04 29, 2014, from http://www.frost.com/prod/servlet/press-release.pag?docid=287657266

Furubotn, E. G., & Richter, R. (1991). Institutions and economic theory: The contribution of the new institutional economic. In E. G. Furubotn, & R. Richter, *The New Institutional Economics: An assessment. The new institutional economics: a collection of articles from the Journal of Institutional and Theoretical Economics, 1-32.* (pp. 1-32).

Gadamer, H. (2002). *Truth and Method.* New York, NY.

Gaitanides, M. (1995). Führungsorganisation. In H. Corsten, & M. Reiss, *Handbuch Unternehmungsführung* (pp. 419-431). Wiesbaden.

Galagan, P. (1992). How to get your TQM training on track. *Nation's Business, October* , 24–28.

Gale, B. T., & Buzzell, R. D. (1989). Market perceived quality: Key strategic concept. *Strategy & Leadership, 17(2)* , 6-48.

Gambardella, A. (1992). Competitive advantages from in-house scientific research: The US pharmaceutical industry in the 1980s. *Research Policy 21* , 391-401.

Gardner. (2013). *Metalworking Insiders' Report 2012.* Retrieved 03 232, 2013, from http://www.gartner.com/newsroom/id/2592316

Garud, R., & Kumaraswamy, A. (1995). Technological and organizational designs for realizing economies of substitution. *Strategic Management Journal* , 93-109.

Garud, R., & Nayyar, P. R. (1994). Transformative capacity: Continual structuring by intertemporal technology transfer. *Strategic Management Journal, Vol. 15* , 365-385.

Garvin, D. A. (1988). *Managing quality: The strategic and competitive edge.* New York: Free Press.

Garvin, D. A. (1984). What does product quality really mean. *Sloan management review, 26(1)* .

Gaskin, S. P., Griffin, A., Hauser, J. R., Katz, G. M., & Klein, R. L. (2010). Voice of the Customer. In *Wiley International Encyclopedia of Marketing.*

Gee, S. (1978). Factors affecting the innovation time-period. *Research Management, 21(1)* , 37-42.

Gengler, C., & Reynolds, T. (1995). Consumer understanding and advertising strategy: Analysis and strategic translation of laddering data. *Journal of Advertising Research, 35(4)* , 19-32.

George, A. L., & Bennett, A. (2005). *Case studies and theory development in the social sciences.* MIT Press.

Germany Trade & Invest. (2013). *Industry Overview: The Medical Technology Industry in Germany*. Retrieved 03 26, 2013, from www.gtai.com/medtech: http://www.gtai.de/GTAI/Content/EN/Invest/_SharedDocs/Downloads/GTAI/Industry-overviews/industry-overview-medical-technology-en.pdf

Gersick, C. J. (1988). Time and transition in work teams: Toward a new model of group development. *Academy of Management Journal, 31* , 9-41.

Gerwin, D. (1993). Manufacturing Flexibility: A Strategic Perspective. *Management Science,Vol. 39* , 395-410.

Ghemawat, P. (2006). *Strategy and the Business Landscape.* Upper Saddle River, NJ.

Gibson, B. C., & Birkinshaw, J. (2006). The antecedents, consequences, and mediating role of organizational ambidexterity. *Academy of Management Journal, Vol. 47* , 209-226.

Giesberts, P. M., & Tang, L. V. (1992). Dynamics of the customer order decoupling point: impact on information systems for production control. *Production Planning & Control, 3(3)* , 300-313.

Gilbert, X., & Strebel, P. (1985). Outpacing Strategies. *IMEDE – Perspectives for Managers, No. 2* .

Gilmore, A., & Carson, D. (1996). Integrative qualitative researching: a services context. *marketing Intelligence and Planning, Vol. 14, No. 6* , 21-26.

Gilmore, H. L. (1974). Product conformance cost . *Quality progress, 7(5)* , 18-19.

Gilmore, J. H., & Pine, B. J. (1997). The four faces of mass customization. *Harvard Business Review, 75(1)* , 91.

Ginsberg, A. (1990). Connecting diversification to performance: A sociocognitive approach. *Academy of Management Review, Vol. 15* , 514-535.

Ginsberg, A. (1994). Minding the competition: From mapping to mastery. *Strategic Management Journal, Vol. 15* , 153-174.

Godfrey, P. C., & Hill, C. W. (1995). The problem of unobservables in strategic management research. *Strategic Management Journal, Vol. 16* , 519-533.

Gold, B. (1987). Approaches to accelerating product and process development. *Journal of Product Innovation Management, 4(2)* , 81-88.

Goldhar, J. D., & Lei, D. (1995). Variety is free: manufacturing in the twenty-first century. *The Academy of Management Executive, 9(4)* , 73-86.

Goldhar, J. D., Jelinek, M., & Schlie, T. W. (1991). Flexibility and competitive advantage manufacturing becomes a service business. *International Journal of Technology Management, 6(3-4)* , 243-259.

Golembiewski, B. (2000). Three perspectives on appreciative inquiry. *oD practitioner, 32(1)* , 54-58.

Gomory, R. E. (1989). From the ladder of science to the product development cycle. *Harvard Business Review, 67(6)* , 99-105.

Govers, C. P. (2001). QFD not just a tool but a way of quality management. *International Journal of Production Economics, 69(2)* , 151-159.

Govers, C. P. (1996). What and how about quality function deployment (QFD). *International journal of production economics, 46* , 575-585.

Graham, I. (1994). *Object oriented methods.* Workingham.

Grant, R. M. (2005). *Contemporary strategy analysis.* Malden, MA: Blackwell Publishing.

Greene, J., & McClintock, C. (1985). Triangulation in evaluation: design and analysis issues. *Evaluation Review, Vol. 5* , 523-545.

Griffin, A., & Hauser, J. R. (1993). The voice of the customer. *Marketing science, 12(1)* , 1-27.

Grönroos, C. (1983). *Strategic management and marketing in the service sector.* Cambridge: Marketing Science Institute.

Grunert, K. G., & Grunert, S. C. (1995). Measuring subjective meaning structures by the laddering method: theoretical considerations and methodological problems. *International Journal of Research in Marketing, 12* , 209-225.

Guba, E. G., & Lincoln, Y. S. (1994). Competiting paradigms in qualitative research. In N. K. Denzin, & Y. S. Lincoln, *Handbook of qualitative research* (pp. 105-117). Thousand Oaks, CA.

Gubrium, J. F., & Holstein, J. A. (2002). *Handbook of interview research: Context and method.*

Gupta, A. K., & Singhal, A. (1993). Managing human resources for innovation and creativity. *Research Technology Management, Vol. 36* , 41-48.

Gupta, A. K., & Wilemon, D. L. (1991). Accelerating development ol technology-based new products. *Caiifornia Managemenf Review, 32(2)* , 24-44.

Gupta, A. K., Brockhoff, K., & Weisenfeld, U. (1992). Making trade-offs in the new product development process: A German/US comparison. *Journal of Product Innovation Management, 9(1)* , 11-18.

Gupta, A. K., Smith, K. G., & Shalley, C. E. (2006). The interplay between exploration and exploitation. *Academy of Management Journal, Vol. 49, No. 4* , 693-706.

Gupta, Y. P., & Goyal, S. (1989). Flexibility of manufacturing systems: concepts and measurements. *European journal of operational research, 43(2)* , 119-135.

Gutman, J. (1982). A means-end chain model based on consumer categorization processes. *The Journal of Marketing* , 60-72.

Gutman, J., & Reynolds, T. J. (1979). An investigation at the levels of cognitive abstraction utilized by the consumers in product differentiation. *Attitude research under the sun* , 128-150.

Haedrich, G., Gussek, F., & Tomczak, T. (1989). Differenzierte Marktbearbeitung und Markterfolg im Reiseveranstaltermarkt der Bundesrepublik Deutschland. *Marketing ZFP, No.1, 1989* , 11-19.

Hagel, J. (1988). Managing complexity. *The McKinsey Quarterly, 2* , 1-23.

Hall, J. A. (1991). *Bringing new products to market.* New York: Amacom.

Hall, K. H. (1982). *Organizations, Structure and Process.* Englewood Cliffs.

Hall, K. H. (1980). Survival strategies in a hostile environment. *Harvard Business Review, No. 5* , 75-85.

Hambrick, D. C. (1983). High Profit Strategies in Mature Capital Goods Industries: A Contingency Approach. *Academy of Management Journal, Vol. 26, No. 4* , 687-705.

Hambrick, D. C., & D'Aveni, R. A. (1988). Large Corporate failures as downward spirals. *Administrative Science Quarterly, Vol. 33* , 1-23.

Hambrick, D. C., & Lei, D. (1984). Towards an Empirical Priorization of Contingency Variables for Business Strategy. *Academy of Management Journal, Vol. 10* , 687-707.

Hambrick, D. C., & Mason, P. A. (1984). Upper echelons: The organization as a reflection of its top managers. *Academy of Management Review* , 195-206.

Hambrick, D. (1983). High Profit Strategies in Mature Capital Goods Industries: A Contingency Approach. *Academy of Management Journal* , 687-707.

Hamel, G. (1994). The Concept of Core Competence. In G. Hamel, & A. Heenev, *Competence Based Competition* (pp. 11-33). Chichester.

Handfield, R. B. (1994). Effects of concurrent engineering on make-to-order products. *IEEE Transactions on Engineering Management, 41* , 384-393.

Hannan, M. T., & Freeman, J. (1988). The ecology of organizational mortality: American labor unions, 1836-1985. *American Journal of Sociology, Vol. 94* , 25-52.

Hannan, M., Barron, D., & Carroll, G. (1991). On the interpretation of dependence in rates of organizational mortality: A reply to Peterson and Koput. *American Sociological Review, Vol. 56* , 410-415.

Harper, D. (1992). Small n's and community case studies. In C. C. Ragin, & H. S. Becker, *What is a case? Exploring the foundations of social inquiry* (pp. 139-158). Cambridge, MA.

Harry, M. J. (1988). *The nature of six sigma quality.* Shaumburg, Illinois: Motorola University Press.

Hartley, J. (1994). Case studies in organizational research. In C. Cassel, & G. Symon, *Qualitative methods in organizational research* (pp. 208-229). London, UK.

Hau, L., & Tang, C. (1997). Modelling the costs and benefits of delayed product differentiation. *Management Science, Vol. 43* , 40-53.

Hawley, J. K. (1995). Where's the Q in TQM? . *Quality Progress, October* , 63-64.

Hax, A. C., & Majluf, N. S. (1992). *The Strategy Concept and Process.* Englewood Cliffs, NJ.

Hayek, F. A. (1989). The pretense of knowledge. *American Economic Review, Vol. 79, No. 6* , 3-7.

Healy, M., & Perry, C. (2000). Comprehensive criteria to judge validity and reliability of qualitative research within the realism paradigm. *Qualitative Market Research* , 118-126.

Helfat, C. E., & Peteraf, M. A. (2003). The dynamic resource-based view: Capability lifecycles. *Strategic Management Journal, Vol. 24* , 997-1010.

Henderson, K. R. (1979). *Henderson on Corporate Strategy.* New York.

Henderson, R. M., & Clark, K. B. (1990). Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Administrative Science Quarterly, Vol. 35* , 9-30.

Hildebrand, V. G. (1997). Empirische Analyse der Individualisierung als strategische Option der Marktbearbeitung. In *Individualisierung als strategische Option der Marktbearbeitung* (pp. 97-224). Deutscher Universitätsverlag.

Hill, C. (1988). Differentiation Versus Low Cost or Differentiation and Low Cost: A Contingency Framework. *The Academy of Management Review Vol. 13* , 401-412.

Hinchliffe, S., Crang, M. A., Reiner, S. M., & Hudson, A. C. (1997). Software for qualitative research: 2.Some thought on "aiding" analysis. *Environment and Planning* , 1109-1124.

Hinterhuber, H. M. (1980). *Strategische Unternehmensführung, 2. Auflage.* Berlin, New York.

Hirschman, E. C. (1986). Humanistic Inquiry in Marketing Research: Philosophy, Method, and Criteria. *Journal of Marketing Research, Vol. 23, No. 3* , 237-249.

Hitt, M. A., Harrison, J. S., Ireland, R. D., & Best, A. (1998). Attributes of successful and unsuccessful acquisitions of U.S. firms. *British Journal of Management, Vol. 9* , 91-114.

Hitt, M. A., Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. (1996). The market for corporate control and firm innovation. *Academy of Management Journal, Vol. 39* , 1084-1119.

Hofer, C. W., & Schendel, D. (1978). *Strategy Formulation: Analytical Concept.* St. Paul: MN: West.

Holden, M., & Lynch, P. (2004). Choosing the appropriate methodology: Understanding research philosophy. *The Marketing Review, Vol. 4, No.4* , 397-409.

Holstein, J. A., & Gubrium, J. F. (1995). *The active interview.* Newbury Park.

Hoskisson, R. E., & Hitt, M. A. (1990). Antecedents and performance outcomes of diversification: A review and critique of theoretical perspectives. *Journal of Management, Vol. 16* , 461-509.

Hoskisson, R. E., Hitt, M. A., Wan, W. P., & Yiu, D. (1999). Theory and research in strategic management: Swings of a pendulum. *Journal of Management, Vol. 25, No. 3* , 417-456.

Hoskisson, R. E., Johnson, R. A., & Moesel, D. D. (1994). Corporate divestiture intensity in restructuring firms: Effects of governance, strategy, and performance. *Academy of Management Journal, Vol. 37* , 1207-1251.

Huffman, C., & Kahn, B. E. (1998). Variety for sale: mass customization or mass confusion? *Journal of retailing, Vol. 74, No. 4* , 491-513.

Hunt, M. (1972). *Competition in the Mafor Home Appliance Industry.* Cambridge.

Hunt, V. D. (1992). *Quaiity in America: How to implement a competitive guaJity program.* Homewood, IL: Irwin.

Hussey, J., & Hussey, R. (1997). *Business Research: A Practical Guide for Undergraduate and Postgraduate Students.* Palgrave: Basingstoke.

Inclean Magazine. (2011, 03 04). *RoW markets to drive significant equipment sales' growth*. Retrieved 03 13, 2014, from http://www.incleanmag.com.au: http://www.incleanmag.com.au/2011/03/04/row-markets-to-drive-significant-equipment-sales-growth/

Irani, Z., Beskese, A., Love, & D., P. E. (2004). Total quality management and corporate culture: constructs of organisational excellence. *Technovation, 24(8)* , 643-650.

Itami, H., & Roehl, T. W. (1987). *Mobilizing invisible assets.* Cambridge, MA.

Ito, K., & Rose, E. L. (2004). An emerging structure of corporations. *Multinational Business Review, 12(3)* , 63-83.

Jackson, B. B. (1985). Build customer relationships that last. *Harvard Business Review, 63(6)* , 120-128.

Jacobson, R. (1987). The validity of ROI as a measure of business performance. *American Economic Review, Vol. 77* , 470–478.

Jäger, S. (. (2004). Mass Customization—ein Konzept der effizienten Leistungsindividualisierung. In *Absatzsysteme für Mass Customization* (pp. 9-112). Deutscher Universitätsverlag.

Jaikumar, R., & Bohn, R. (1986). The development of intelligent systems for industrial use: a conceptual framework. *Research on technological innovation, management and policy* , 169-211.

Jain, R. K., & Triandis, H. C. (1990). *Management oi research and development organizations.* New York, NY: Wiley.

Jarvenpaa, S. L., & Ives, B. (1991). Executive Involvement and Participation in the Management of Information Technology. *MIS Quarterly, Vol. 15* , 205-227.

Jarzabkowski, P. (2008). Shaping strategy as a structuration. *Academy of Management Journal, Vol. 51* , 621-650.

Jarzabkowski, P. (2005). *Strategy as Practice: An Activity Based Approach.* London, UK.

Jenner, T. (1999). *Determinanten des Unternehmenserfolges,.* Stuttgart.

Jensen, M. C., & Meckling, W. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, Vol. 3* , 305-360.

Jiao, J., & Tseng, M. M. (2000). Understanding product family for mass customization by developing commonality indices. *Journal of Engineering Design 11(3)* , 225-243.

Jiao, J., Ma, Q., & Tseng, M. M. (2003). Towards high value-added products and services: mass customization and beyond. *Technovation, Vol. 23* , 809–821.

Johnson, G., & Huff, A. (1997). Everyday innovation/everady strategy. In G. Hamel, C. K. Prahalad, H. Thomas, & D. O'Neill, *Mapping Strategic Knowledge.* London, UK.

Johnson, G., Leif, M., & Whittington, R. (2003). Micro strategy and strategizing: Towards an activity-based view. *Journal of Management Studies, Vol. 1, No. 1* , 3-22.

Johnson, P. (2011). Transcending the polarity of light and shadow in appreciative inquiry: An appreciative exploration of practice. In D. Zandee, D. Cooperrider, & M. Avital, *Generative Organization: Advances in Appreciative Inquiry, Vol. 4.* Bingley, England: Emerald Publishing.

Johnson, P., & Clark, M. (2006). *Mapping the terrain: an overview of business and management research.* London: Sage.

Johnston, R., & Smith, S. S. (2010). How critical realism clarifies validity issues in theory-testing research: analysis and case. In D. N. Hart, & S. D. Gregor, *Information systems foundations: The Role of Design Science* (pp. 21-47). Canberra, AUS.

Johnston, W. J., Leach, M. P., & Annie, H. L. (1999). Theory testing using case studies in business-to-business research. *Industrial Marketing Management, Vol. 28* , 201-213.

Jonassen, D. H., & Rohrer-Murphy, L. (1997). Activity theory as a framework for designing constructivist learning environments. *Educational Technology, Research and Development, Vol. 47, No. 1* , 61-79.

Jones, G., & Butler, J. (1988). Cost, Revenue, and Business-Level Strategy. *The Academy of Management Review Vol. 13* , 201-213.

Jönsson, S., & Lundin, R. (1977). Myths and wishful thinking as management tools. In P. C. Nystrom, & W. H. Starbucks, *Prescriptive models of organizations.* Amsterdam.

Juran, J. M. (1989). *Juran on leadership for quality: an executive handbook.* Wilson, CT: McGraw-Hill.

Juran, J. M. (1988). *Juran on planning for quality.* New York: Free Press.

Juran, J. M. (1951). *Quality control handbook, first edition.* New York: McGraw-Hill.

Juran, J. M., & Bingham, R. S. (1974). Service industries. In J. M. Juran, F. J. Gryna, & R. Bingham, *Quality control handbook: 47-1* (pp. 47-35). New York: McGraw-Hill.

Juran, J. M., & Gryna, F. M. (1988). *Juran's quality control handbook (4th ed.).* New York: McGraw-Hill.

Kanter, R. M. (1988). When a thousand flowers bloom: Structural, collective, and social conditions for innovation in organizations. In L. L. Cummings, & B. M. Slaw, *Research in organizafionai behavior* (pp. 169-211). Greenwich, CT: JAI Press.

Karagozoglu, N., & Brown, W. B. (1993). Time-based management of the new product development process. *Journal of Product Innovation Management, 10* , 204-215.

Karnani, A. (1984). Generic competitive strategies - An analytical approach. *Strategic Management Journal, Vol. 5, No. 4* , 367–380.

Kekre, S., & Srinivasan, K. (1990). Broader product line: a necessity to achieve success?. . *Management Science, 36(10)* , 1216-1232.

Kelle, U. (1997a). Capabilities for theory buidling and hypothesis testing in software for computer-aided qualitative data analysis. *Data Archive Bulleting, 65* .

Kelle, U. (1997b). Theory building in qualitative reserach and computer programs for the management of textual data. *Sociological Research Online, 2(2)* .

Keller, R. T. (1986). Predictors of the performance of project gioups in R&D organizations. *Academy of Managemenf Journal, 29* , 715-726.

Kelly, G. A. (1955). *The Psychology of personal constructs (Vol. 1 and 2).* Norton, NY.

Keogh, W., Atkins, M., & Dalrymple, J. (2000). Data collection and the economics of quality: identifying problems. *Quality Congress.* Sydney.

Kessler, E. H., & Chakrabarti, A. K. (1996). Innovation speed: a conceptual model of context, antecedents, and outcomes. *Academy of Management Review, 21(4)* , 1143-1191.

Kim, E., Nam, D., & Stimpert, J. L. (2004). Testing the applicability of Porter's generic strategies in the digital age: a study of Korean cyber malls. *Journal of Business Strategy, Vol. 21* , 19-45.

Kim, J. K., Han, C. H., Choi, S. H., & Kim, S. H. (1998). A knowledge-based approach to the quality function deployment. *Computers & industrial engineering, 35(1)* , 233-236.

Kim, L., & Lim, Y. (1988). Environment, generic strategies, and performance in rapidly developing countries: A taxonomic approach. *Academy of Management Journal, Vol. 31, No. 4* , 802-827.

King, B. E., & Penlesky, R. J. (1992). Impediments to timely delivery of new products at an industrial products firm. *International Journal of Operations and Productions Management, 12* , 56-65.

King, N. (2004). Using interviews in qualitative reserach. In C. Cassell, & G. Symon, *Essential guide to qualitative methods in organizational research* (pp. 11-22). London.

Kirk, J., & Miller, M. L. (1986). *Reliability and validity in qualitative research.* London: Sage.

Kirsch, W., & Obring, K. (1991). *Beiträge zum Management strategischer Programme, Rahmenkonzepte und Programme.* München.

Kleinaltenkamp, M. (1987). Die Dynamisierung strategischer Marketing-Konzepte. *Zeitschrift für betriebswirtschaftliche Forschung, Vol. 39* , 31-52.

Kleinschmidt, E. J., & Cooper, R. G. (1991). The impact of product innovativeness on performance. *Journal of product innovation management, 8(4)* , 240-251.

Kloock, J., & Sabel, H. (1993). Economies und Savings als grundlegende Konzepte der Erfahrung – Was bringt mehr? *Zeitschrift für Betriebswirtschaft, 63. Jg.* , 209-233.

Knyphausen, D. z., & Ringlstetter, M. (1991). Wettbewerbsumfeld, Hybride Strategien und Econoies of Scope. In W. Kirsch, *Beiträge zum Management strategischer Programme* (pp. 539-557). Herrsching.

Knyphausen-Aufseß, D. z. (1997). Auf dem Weg zu einem ressourcenorientierten Paradigma? Resource-View des Strategischen Management im Vergleich. In G. Ortmann, *Theorien der Organisation: Die Rueckkehr der Gesellschaft* (pp. 452-480). Opladen: Westdeutscher Verlag.

Kochhar, R., Hitt, M. A., & Bierman, L. (1996). Effects of human capital and reputation on the diversification-performance relationship in law firms: A test of the resource-based view. *Strategic Management Society meetings.* Phoenix.

Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science, Vol. 3* , 383-397.

Kolb, D. A. (1984). *Experiential Learning.* Englewood Cliffs, NJ.

Kordupleski, R., Rust, R., & Zahorik, A. (1994). Marketing: the missing dimension in quality management. *California Management Review (3)* .

Kotha, S. (1996). From mass production to mass customization: the case of the National Industrial Bicycle Company of Japan. *European Management Journal, Vol. 14, No. 5* , 442-450.

Kotha, S. (1995). Mass customization: Implementing the emerging paradigm for competitive advantage. *Strategic Management Journal, Vol. 16* , 21-42.

Kotha, S., & Orne, D. (1989). Generic Manufacturing Strategies: A Conceptual Synthesis. *Strategic Management Journal 1989* , 211-231.

Kotha, S., & Vadlamani, B. L. (1995). Assessing Generic Strategies: An Empirical Investigation of Two Competing Typologies in Discrete Manufacturing Industries, in:. *Strategic Management Journal, No.16* , 75-83.

Kotha, S., Dunbar, R. L., & Bird, A. (1995). Strategic Action Generation: A Comparison of Emphasis Placed on Generic Competitive Methods by U.S. and Japanese Managers. *Strategic Management Journal, No.16* , 195-220.

Kupsch, P. U., Marr, R., & Picot, A. (1991). Innovationswirtschaft. In *Industriebetriebslehre* (pp. 1069-1156). Gabler Verlag.

Kvale, S. (2008). *Doing interviews.* Sage.

Lakhe, R., & Mohanty, R. (1994). Total quality management: concepts, evolution and acceptability in developing economies. *International Journal of Quality & Reliability Management, 11(9)* , 9–33.

Lampel, J., & Mintzberg, H. (1996). Customizing customization. *Sloan Management Review 38* , 21-30.

Lancaster, K. (1971). *Consumer demand: A new approach.*

Lancaster, K. (1990). The economics of product variety: A survey. *Marketing Science, Vol. 9, No. 3* , 189-206.

Lawrence, P. R., & Dyer, D. (1983). *Renewing American industry.* New York, NY: Free Press.

Lawrence, P. R., & Lorsch, J. W. (1967). *Organization and environment.* Homewood, IL: Irwin.

Lawson, T. (1997). *Economics and reality.* London, UK.

Lazonick, W. (2010). The Chandlerian corporation and the theory of innovative enterprise. *Industrial and Corporate Change, 19(2)* , 317-349.

Leachman, R. C., & Ding, S. (2007). Integration of speed economics into decision-making for manufacturing management. *International Journal of Production Economics, 107(1)* , 39-55.

Leachman, R., & Hodges, D. (1996). Benchmarking semiconductor manufacturing. *IEEE Transactions on Semiconductor Manufacturing, 9 (2)* , 158-169.

Leana, C. R., & Barry, B. (2000). Stability and change as simultaneous experiences in organizational life. *The Academy of Management Review, Vol. 25* , 753-759 .

Lee, C.-H., Barua, A., & Whinston, A. (2000). The comple- mentarity of mass customization and electronic commerce. *Economics of Innovation and New Technology, 9(2)* , 81–110.

Lee, H. L., & Billington, C. (1993). Material management in decentralized supply chains. *Operations Research* , 835-847.

Leech, N. L., & Onwuegbuzie, A. J. (2007). An array of qualitative data analysis tools: a call for data analysis triangulation. *School Psychology Quarterly, Vol. 22, No. 4* , 557-584.

Leech, N. L., & Qnwuegbuzie, A. J. (2011). Beyond constant comparison qualitative data analysis: Using NVivo. *School Psychology Quarterly* , 70-84.

Leedy, P. (1989). *Practical Research.* New York: Mcmillan.

Lei, D., Hitt, M. A., & Bettis, R. A. (1996). Dynamic core competences through meta-learning and strategic context. *Journal of Management, Vol. 22* , 549-569.

Leitner, K.-H., & Güldenberg, S. (2009). Generic strategies and firm performance in SMEs: a longitudinal study of Austrian SMEs. *Small Business Economics* , 169-189.

Leonard-Barton, D. (1990). A dual methodology for case studies: Synergistic use of longitudinal single site with replicated multiple sites. *Organization Science, Vol. 1, No. 3* , 248-266.

Leontov, A. N. (1978). *Activity, consciousness, and personality.*

Levitt, T. (1972). Production-line approach to service. *Harvard Business Review. 50(5)* , 41-52.

Liebling, A., Price, D., & Elliott, C. (1999). Appreciative inquiry and relationships in prison. *Punishment and Society, Vol. 1, No. 1* , 71-98.

Lin, C. (2002). Attribute-consequence-value linkages: A new technique for understanding customer's product knowledge. *Journal of Targeting Measurement and Analysis for Marketing, 10* , 339-352.

Link, J. (1985). *Organisation der strategischen Planung.* Heidelberg/Wien.

Lippman, S. A., & Rumelt, R. (1982). Uncertain Imitability: An analysis of interfirm differences in efficiency under competition. *The Bell Journal of Economics, Vol. 13* , 418-438.

Lusch, R., & Laczniak, G. (Vol. 17). Macro-environmental forces, marketing strategy and business performance: a future approach. *Jounral of the Academy of Marketing Science* , 283-295.

Mabert, V. A., Muth, J. F., & Schmenner, R. W. (1992). Collapsing new product development times: Six case studies. *Journal of Product Innovation Management, 9* , 200-212.

MacCarthy, B., Brabazon, P., & Bramham, J. (2003). Fundamental modes of operation for mass customisation. *International Journal of Production Economics, 85(3)* , 289–308.

Macmillan, I. C. (1989). Delineating a forum for business policy scholars. *Strategic Management Journal, Vol. 10* , 391-395.

Macmillan, I. C. (1991). The emerging forum for business policy scholars. *Strategic Management Journal, Vol. 12* , 161-165.

Mahoney, J. T., & Pandian, J. R. (1992). The Resource-Based View Within the Conversation of Strategic Management. *Strategic Mangement Journal, Vol. 13* , 363-380.

Mahr, F. (2010). *Hybrid Strategy and Firm Performance: The moderating role of Individual and Technological Ambidexterity.* Munich.

Maidique, M. A. (1980). Entrepreneurs, champions, and technological innovation. *Sloan Management Review, 21(2)* , 59-76.

Makadok, R. (2001). Toward a synthesis of the resource-based and dynamic-capability views of rent creation. *Strategic Management Journal, Vol. 22, No. 5* , 387-401.

Makadok99, R. (2001). “Toward a synthesis of the resource-based and dynamic-capability views of rent creation”. *Strategic Management Journal, Vol. 22 No. 5* .

Mansfield, E. (1988). The speed and cost of industrial innovation in Japan and the United States: External vs. internal technology. *Management Science, 34* , 1157-1169.

Mansfield, R. (1986). *Company Strategy and Organizational Change.* London.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, Vol. 2* , 71-87.

March, J. G., & Simon, H. A. (1958). *Organizations.* New York, NY: Wiley.

Marples, D. L. (1961). The decisions of engineering design. *Engineering Management, IRE Transactions on, (2)* , 55-71.

Mason, E. (1939). Price and production policies of large scale enterprise. *American Economic Review, No. 29* , 61-74.

Mason, J. (1996). *Qualitative researching.* London: Sage.

Matzler, K., & Hinterhuber, H. H. (1998). How to make product development projects more successful by integrating Kano's model of customer satisfaction into quality function deployment. *Technovation, 18(1)* , 25-38.

Mazzola, P., & Kellermanns, F. W. (2010). *Handbook of Research on Strategy Process.* Northampton, MA.

McGahan, A., & Porter, M. (1997). How much does Industry Matter, Really? *Strategic Management Journal; Vol. 30* , 15-30.

McGee, B. (1985). *Popper.* London.

McKee, D. O., Varadarajan, P. R., & Pride, W. M. (1989). Strategic adaptability and firm performance: a market-contingent perspective. *Journal of Marketing, Vol. 53* , 21-35.

McKinsey&Company. (2014, 02). *A multifaceted future: The jewelry industry in 2020*. Retrieved 04 29, 2014, from http://www.mckinsey.com/insights/consumer_and_retail/a_multifaceted_future_the_Jewelry_industry_in_2020

McLachlin, R. (1997). Management initiatives and just-in-time manufacturing. *Journal of Operations Management, 15(4)* , 271-292.

McQuarrie, E. (2008). *Customer Visits.* New York, NY: M.E. Sharpe.

Meffert, H. (1974). *Interpretation und Aussagewert des Produktlebenszyklus-Konzeptes.* Institut für Marketing der Universität Münster.

Mellahi, K., & Wilkinson, A. (2004). Organizational Failure: A critique of recent research and a proposed integrative framework. *International Journal of Management Reviews; Vol. 5, No. 1* , 21-41.

Meyer, C. (1993). *Fast cycle time: How to align purpose, strategy, and strucfure for speed.* New York: Free Press.

Meyer, C., & Purser, R. E. (1993). Six steps to becoming a fast-cycle competitor. *Research Technology Management, 36(5)* , 41-48.

Meyer, K. M. (2003). *Qualitätsmängel und Folgekosten.* GRIN Verlag.

Meyer99, C. (1993). *Fast cycle time: How to align purpose, strategy, and strucfure for speed.* New York: Free Press.

Meyers, S., & Marquis, D. G. (1969). *Successful industrial innovations.* Washington, DC: National Science Foundation.

Michael, S. (2005). The promise of appreciative inquiry as an interview tool for field research. *Development in Practice, Vol. 15, No. 2* , 222−230.

Miles, M. B., & Hueberman, M. A. (1994). *Qualitative data analysis - An expanded sourcebook.* Thousand Oaks, CA.

Miles, R. E., & Snow, C. C. (1978). *Organizational Strategy, Structure, and Process.* New York: McGraw-Hill.

Miles, R. H. (1980). *Macro Organizational Behavior.* Genview.

Miles, R., & Snow, C. (1986). Organizations: New concepts for new forms. *California Management Review, 18 (3)* , 62-73.

Miller, A., & Dess, G. G. (1993). Assessing Porter's (1980) Model in terms of its generalizability, accuracy and simplicity. *Journal of Management Studies, Vol. 30, No. 4* , 553-586.

Miller, D. (1992). Generic Strategies: Classification, Combination and Context. In P. Shrivastava, *Advances in Strategic Management* (pp. 391-408). Greenwich, Conneticut.

Miller, D. (1988). Relating Porter's Business Strategies to Environment and Structure: Analysis and Performance Implications. *Academy of Management Journal, No.2* , 280-308.

Miller, D. (1987). The Structural and Environmental Correlates of Business Strategy. *Strategic Management Journal, Vol. 8* , 55-76.

Miller, D., & Friesen, P. H. (1986). Porter's (1980) generic strategies and performance: An empirical examinisation with American data. Part I: Testing Porter. *Organizational Studies, Vol. 3* , 37-55.

Miller, J. G., & Vollmann, T. E. (1985). The hidden factory. *Harvard business review, 63(5)* , 142-150.

Miller, K. D. (2005). The problem of method and the practice of management research. In D. J. Ketchen, & D. D. Bergh, *Research Methodology in Strategy and Management* (pp. 143-177). Amsterdam, The Netherlands: Elsevier.

Miller, K. D., & Tsang, E. W. (2010). Testing Management Theories: Critical Realist Philosophy and Research Methods. *Strategic Management Journal, Vol. 32* , 139-158.

Miller, M. G., Fitzgerald, S. P., Murrell, K. L., Preston, J., & Ambekar, R. (2005). Appreciative Inquiry in Building a Transcultural Strategic Alliance. *The Journal of Applied Behavioral Science, 41(1)* , 91-110.

Miller99, J. G., & Vollmann, T. E. (1985). The hidden factory. *Harvard Business Review, Vol. 63, No. 5* , 142-150.

Millson, M. R., Raj, S. P., & Wiiemon, D. (1992). A survey of major approaches for accelerating new product development. *Journal of Product Innovation Management, 9* , 53-68.

Mingers, J. (2000). The Contribution of Critical Realism as an Underpinning Philosophy for OR/MS and Systems. *The Journal of the Operational Research Society, Vol. 51, No. 11* , 1256-1270.

Mintzberg, H. (1979). An emerglng strategy of "direct" research. *Administrative Science Quarterly, Vol. 24* , 580-589.

Mintzberg, H. (1978). Patterns in strategy formation. *Management Science, Vol. 24* , 934-949.

Mintzberg, H. (1973). *The Nature of Managerial Work.* New York.

Mintzberg, H. (1987). The strategy concept I: Five P's for strategy. *California Management Review, Vol. 30, No. 1* , 11-24.

Mintzberg, H., Ahlstrand, B., & Lampel, J. (1999). *Strategy Safari: A Guided Tour Through the Wilds of Strategic Management.* Vienna.

Mintzberg, H., Lample, J., Quinn, J. B., & Goshal, S. (2003). *The Strategy Process: Concepts, Contexts, Cases.* Harlow, UK.

Mintzberg, H., Raisinghani, O., & Theoret, A. (1976). The structure of unstructured decision processes. *Administrative Science Quarterly, Vol. 21* , 246-275.

Mir, R., & Watson, A. (2001). Critical realism and constructivism in strategy research: Towards a synthesis. *Strategic Management, Vol. 22* , 1169–1173 .

Mitchell, J. C. (1983). Case and situation analysis. *Sociological Review, Vol. 34* , 187-211.

Mohr-Jackson, I. (1998). Conceptualizing total quality orientation. *European Journal of Marketing, 32(1/2)* , 13-22.

Moore, M. (2005). Towards a confirmatory model of retail strategy types: An empirical test of Miles and Snow. *Journal of Business Research, Vol. 58, No. 5* , 696-704.

Morschetta, D., Swobodab, B., & Schramm-Klein, H. (2006). Competitive strategies in retailing—an investigation of the applicability of Porter’s framework for food retailers. *Journal of Retailing and Consumer Services, Vol. 13* , 275-287.

Mueller, D. C. (1977). The persistence of profits above the norm. *Economica, Vol. 44* , 369-380.

Murray, A. I. (1988). A Contingency View of Porter’s Generic Strategies. *Academy of Management Review, Vol. 13* , 390-400.

Nagel, E. (1979). *The Structure of Science.* Indianapolis, IN.

Nandakumar, M., Ghobadian, A., & O'Regan, N. (2011). Generic strategies and performance - evidence from manufacturing firms. *International Journal of Productivity and Performance Management* , 222-251.

Nardi, B. A. (1996). Studying context: A comparison of activity theory, situated action models, and distributed cognition. In B. A. Nardi, *Context and consciousness: Activity theory and human computer interaction.* Cambridge, MA.

Nardi, B. (1998). *Context and Consciousness: Activity Theory and Human-Computer Interaction.* Cambridge, MA.

National Institute of Standards and Technology (NIST). (2013-2014, February 2). *National Institute of Standards and Technology (NIST)*. Retrieved February 2, 2014, from Baldridge

Performance Excellence Program: http://www.nist.gov/baldrige/publications/upload/Category-and-Item-Commentary_BNP.pdf

Nelson, R. R. (1991). Why do firms differ and how does it matter? . *Strategic Management Journal, Vol. 12* , 61-74.

Nelson, R. R., & Winter, S. G. (1977). In search of useful theory of innovation. *Research Policy, 6* , 36-76.

Neuman, W. L. (2005). *Social research methods: Qualitative and quantitative approaches.* Milwaukee, Wis.

Nijssen, E. J., Arbouw, A. R., & Commandeur, H. R. (1995). Accelerating new product development: A preliminary empirical test of a hierarchy of implementation. *Journal of Product Innovation Management, 12* , 99-109.

Nobeoka, K., & Cusumano, M. A. (1997). Multiproject strategy and sales growth: the benefits of rapid design transfer in new product development: The benefits of rapid design transfer in new prodcut development. *Strategic Management Journal* , 169-186.

Noblitt, G., & Hare, R. (1988). *Meta-ethnography: Synthesising Qualitative Studies.* London: Sage.

North, D. C. (1991). Institutions STÖR. *The Journal of Economic Perspectives, Vol. 5, No. 1* , 97-112.

Oberheim, E., & Hoyningen-Huene, P. (2013, March 5). *Stanford Encyclopedia of Philosophy*. Retrieved 02 06, 2014, from The Incommensurability of Scientific Theories: http://www.plato.stanford.edu/entries/incommensurability/

Oliver, C. (2005). Critical appreciative inquiry as intervention in organisational discourse. In E. Peck, *Organisational development in healthcare: approaches, innovations, achievements* (pp. 205-218). Oxford: Radcliffe Press.

Oliver, R. (1980). A cognitive model of antecedents and consequences of satisfaction decisions. *Journal of Marketing Research, Vol. 17* , 460-469.

Oliver, R. L., & DeSarbo, W. (1988). Response Determinants in Satisfaction Judgments. *Journal ofConsumer Research 14 (March)* , 495-507.

Optech Consulting. (2013). *Laser Materials Processing*. Retrieved 03 26, 2013, from Optech Consulting: http://www.optech-consulting.com/html/laserprocessingmarkets.html

Orton, J. D., & Weick, K. E. (1990). Loosely Coupled Systems: A Reconceptualization. *Academy of Management Journal* , 203-223.

Overton, G., Nogee, A., Belforte, D. A., & Holton, C. (2013). Laser markets rise above global headwinds. *Laser Focus World, 49(1)* , 36-70.

Page, A. (1993). Assessing new product development practices and performance: Establishing crucial norms. *Journal of Product Innovation Management, 10* , 273-290.

Panzar, J. C., & Willig, R. D. (1981). Economies of scope. *The American Economic Review, Vol. 71, No. 2* , 268-272.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1985). A conceptual model of service quality and its implications for future research. *Journal of Marketing, 4(4)* , 41-50.

Parker, B., & Helms, M. M. (1992). Generic Strategies and Firm Performance in a Declining Industry. *Management International Review, Vol.32* , 23-39.

Parnell, J. A. (1997). New Evidence in the Generic Strategy and Business Performance Debate: A Research Note. *British Journal of Management, Vol. 8,* , 175–181.

Parnell, J. A. (1998). Performance's influence on strategic change: A longitudinal assessment. *Scandinavian Journal of Management, Vol. 14* , 19-36.

Parnell, J. (2000). Reframing the combination strategy debate: defining forms of combination. *Journal of Applied Management Studies, Vol. 9, No. 1* , 33-54.

Parnell, J. (2011). Strategic capabilities, competitive strategy, and performance among retailers in Argentina, Peru and the United States. *Management Decision, Vol. 49, No.1* , 139-155.

Patterson, M. L. (1998). From experience: linking product innovation to business growth. *Journal of Product Innovation Management, 15(5)* , 390-402.

Patterson, M. L., & Lightman, S. (1993). *Accelerating innovation: improving the process of product development.* New York: Van Nostrand Reinhold.

Patton, M. Q. (2003). Inquiry into appreciative evaluation. *New Directions for Evaluation* , 85-98.

Patton, M. Q. (1990). *Qualitative Evaluation and Research Methods.* Newbury Park, CA.

Pawson, R., & Tilley, N. (1997). *Realistic Evaluation.* London, UK.

Pearce, J. A., & Robinson, R. B. (2005). *Formulation, Implmentation, and Control of Competitive Strategy.* Boston, MA.

Penrose, E. T. (1959). *The theory of the growth of the firm.* New York.

Peppers, D., & Rogers, M. (1997). *Enterprise One to One.* New York, NY: Doubleday.

Peräkylä, A. (1997). Reliability and validity in research based on tapes and transcripts. In D. Silverman, *Qualitative research: Theory, method, and practice* (pp. 325-330). London, UK.

Perry, C. (1998). Processes of a case study methodology for postgraduate research in marketing. *European Journal of Marketing* , 785-802.

Perry, C., Riege, A., & Brown, L. (1999). Realism's role among scientific paradigms in marketing research. *Irish Marketing Journal, Vol. 12, No. 2* , 16-23.

Pertusa-Ortega, E. M., Molina-Azurin, J. F., & Claver-Cortés, E. (2009). Competitive Strategies and Firm a Comparative Analysis of Pure, Hybrid and 'Stuck-in-the-middle' Strategies in Spanish Firms. *British Journal of Management, Vol. 20, No. 4* , 508-523.

Peteraf, M. (1993). The Cornerstones of Competitive Advantage: A Resource-Based View. *Strategic Management Journal, Vol. 14* , 179-191.

Peters, L., & Saidin, H. (2000). IT and the mass customization of services. *International Journal of Information Management, 20(2)* , 103–119.

Peters, T. (1987). *Thriving on chaos.* New York, NY: Knopf.

Peterson, T., & Koput, K. (1991). Density dependence in organizational mortality: Legitimacy of unobserved heterogeneity. *American Sociological Review, Vol. 56* , 399-409.

Pettigrew, A. M. (1977). Strategy formulation as a political process. *International Studies of Management and Organization , Vol. 7, No. 2* , 78-87.

Phillips, L., Chang, D., & Buzzel, R. (1983). Product Quality, Cost Position and Business Performance: A Test of Some Key Hypotheses. *Journal of Marketing Vol. 47* , 26-43.

Piller, F. T. (2003). *Managing high variety: how to overcome the mass confusion phenomenon of customer co-design.* Basel: University of Applied Sciences Basel.

Piller, F. T. (2000). *Mass Customization - ein Wettbewerbsmodell für das Informationszeitalter.* Wiesbaden: Gabler.

Piller, F. T. (2005). Mass Customization: reflections on the state of the concept. *The International Journal of Flexible Manufacturing Systems, 16* , 313–334.

Piller, F. T., & Moeslein, K. (2002). Economies of interaction and economies of relationship: value drivers in a customer centric economy. *ANZAMIFSAM 2002 Conference*, (pp. 1-15). Brisbane.

Piller, F. T., & Müller, M. (2004). A new marketing approach to mass customisation. *International Journal of Computer Integrated Manufacturing, 17(7)* , 583-593.

Piller, F. T., Moeslein, K., & Stotko, C. M. (2004). Does mass customization pay? An economic approach to evaluate customer integration. *Production planning & control, 15(4)* , 435-444.

Pine, B. J. (1993). *Mass Customization.* Boston: Harvard Business School Press.

Pine, B. J., Pepper, D., & Rogers, M. (1995). Do you want to keep your customers forever? *Harvard Business Review, 73(2)* , 103–104.

Pool, S. W. (2000). The learning organization: motivating employees by integrating TQM philosophy in a supportive organizational culture. *Leadership & Organization Development Journal, 21(8)* , 373-378.

Popper, K. R. (1972). *Objective Knowledge: An Evolutionary Approach.* Oxford, UK.

Porter, M. E. (1980). *Competitive Strategy.* New York.

Porter, M. E. (1985). How Information Gives You Competitive Advantage. *Harvard Business Manager, July-August* .

Porter, M. E. (1981). The Contributions of Industrial Organization to Strategic Management. *Academy of Management Review, Vol. 6, No.4* , 609-620.

Porter, M. E. (1979). The Structure within Industries and Companies' Performance. *Review of Economics and Statistics, Vol. 61* , 214-227.

Porter, M. E. (1991). Towards a Dynamic Theory of Strategy. *Strategic Management Journal, Vol. 12* , 95-117.

Porter, M. E. (1996). What is strategy? *Harvard Business Review* , 61-78.

Porter, M. E. (2002). What is strategy? In M. Mazzucato, *Strategy for Business* (pp. 10-22). London.

Postma, W. (1998). Capacity-building: the making of a curry. *Development in Practice, Vol. 8, No. 1* , 54-63.

Powell, T. C. (1995). Total quality management as competitive advantage: a review and empirical study. *Strategic management journal, 16(1)* , 15-37.

Pozzebon, M. (2004). The influence of a structurationist view on strategic management research. *Journal of Management Studies, Vol. 41* , 247-272.

Prahalad, C. K., & Bettis, R. A. (1986). The dominant logic: A new linkage between diversity and performance. *Strategic Management Journal, Vol. 7, No. 6* , 485-501.

Prahalad, C. K., & Hamel, G. (1990). The Core Competence of the Corporation. *Harvard Business Review, No. 3* , 79-91.

Prasad, B. (1998). Review of QFD and related deployment techniques. *Journal of Manufacturing Systems, 17(3)* , 221-234.

Pratt, C. (2002). Creating unity from competing integrities: A case study in appreciative inquiry methodology. In F. B. R. Fry, & D. Whitney, *Appreciative inquiry and organizational transformation: Reports from the field* (pp. 99-120). Westport: CT: Quorum Books.

Priem, R. L., & Butler, J. E. (2001). Is the resource-based 'view' a useful perspective for strategic management research? *Academy of Management Review, Vol. 26 No. 1* , 22-40.

Proff, H. (2000). Hybrid strategies as a strategic challenge — the case of the German automotive industry. *Omega, Vol. 28, No. 5* , 541-553.

Proff, H., & Proff, H. V. (1997). Möglichkeiten und Grenzen hybrider Strategien. *Die Betriebswirtschaft, No. 6* , 796-809.

Proff99, H. (2000). Hybrid strategies as a strategic challenge — the case of the German automotive industry. *Omega, Vol. 28, No. 5* , 541-553.

Putnam, H. (1990). *Realism with a Human Face.* Cambridge, MA.

Quine, W. V. (1961). *From a logical point of view.* New York, NY.

Quinn, J. B. (1988). Innovation and corporate strategy: Managed chaos. In M. L. Tushman, & W. L. Moore, *Readings in the management of innovation (2nd ed.)* (pp. 123-137). New York, NY: Harper Business.

Raisch, S., & Birkinshaw, J. (2008). Organizational ambidexterity: Antecedents, outcomes, and moderators. *Journal of Management, Vol. 34, No. 3* , 375-409.

Ramirez, R. (1999). Value co-production: intellectual origins and implications for practice and research. *Strategic Management Journal, 20(1)* , 49-65.

Rao, A., & Monroe, K. (1989). The Effect of Price, Brand Name, and Store Name on Buyers' Perceptions of Product Quality: An Integrative Review. *Journal of Marketing Research, 26(3)* , 351–357.

Ray, G., Barney, J., & Muhanna, W. (2004). Capabilities, business processes, and competitive advantage: choosing the dependent variable in empirical tests of the resource-based view. *Strategic Management Journal, Vol. 25 No. 1* , 23-38.

Reed, R., Lemak, D. J., & Mero, N. P. (2000). Total quality management and sustainable competitive advantage. *Journal of quality management, 5(1)* , 5-26.

Reed, R., Lemak, D. J., & Montgomery, J. C. (1996). Beyond process: TQM content and firm performance. *Academy of Management Review, 21(1)* , 173-202.

Reichheld, F. F., & Sasser, W. E. (1990). Zero defections: quality comes to services. *Harvard business review, 68(5)* , 105-111.

Reichwald, R., Piller, F. T., & Moeslein, K. (2000). Information as a critical success factor for mass customization. *ASAC-IFSAM 2000 Conference.* Montreal.

Reiner, G. (1989). Winning the race for new product development. *Management Review, 78* , 52-53.

Reitsperger, W. D., Daniel, S. J., Tallman, S. B., & Chismar, W. G. (1993). Product Quality and Cost Leadership: Compatible Strategies. *Management International Review, No. 1* , 7-21.

Remenyi, D., Williams, B., Money, A., & Swart, E. (2000). *Doing research in business and management: An introduction to process and method.* London: Sage.

Resnick, S. A., & Wolff, R. D. (1987). *Knowledge and Class.* Chicago, IL.

Reynolds, T. J., & Gutman, J. (1988). Laddering theory, method, analysis, and interpretation. *Journal of advertising research, Vol. 28, No. 1* , 11-31.

Reynolds, T. J., & Gutman, J. (1984). Laddering: extending the repertory grid methodology to construct attribute-consequence-value hierarchies. *Personal values and consumer psychology, Vol. 2* , 155-167.

Richard, P. J., Devinney, T. M., Yip, G. S., & Johnson, G. (2009). Measuring organizational performance: Towards methodological best practice. *Journal of management, Vol. 35 No. 3* , 718-804.

Richards, L., & Morse, J. M. (2002). *Readme first for a user's guide to qualitative methods.* Thousand Oaks: Sage.

Richards, L., & Richards, T. (1994). From filing cabinet to computer. In A. Bryman, & R. G. Burgess, *Analysing qualitative data* (pp. 146-172). London: Sage.

Riege, A. M. (2003). Validity and reliability tests in case study research: A literature review with "hands-on" applications for each research phase. *Qualitative Market Research: An International Journal* , 75-86.

Riemer, D. W., & Totz, C. (2003). The many faces of personalization. *The Customer Centric Enterprise* , 35-50.

Ringlstetter, M., & Kirsch, W. (1991). Varianten einer Differenzierungsstrategie. In W. Kirsch, *Beiträge zum Management strategischer Programme* (pp. 559-573). München.

Roberts, E. B., & Berry, C. A. (1984). *Entering new businesses: selecting strategies for success.*

Robinson, R. B., & Pearce, J. A. (1988). Planned Patterns of Strategic Behavior and Their Relationship to Business Unit Performance. *Strategic Management Journal, Vol. 9, No. 1* , 43-60.

Robson, C. (2002). *Real world research.* Oxford, UK.

Rommel, G. (1991). The secret of German competitiveness. *The McKinsey Quarterly, 3* , 40-54.

Rosenau, M. D. (1988). From experience: Faster new product development. *Journal of Product Innovation Management, 5* , 150-153.

Rosenberg, M. J. (1956). Cognitive structure and attitudinal affect. *Journal of Abnormal and Social Psychology* , 367-372.

Rosenthal, S. R. (1992). *Effective product design and development: How to cut lead time and increase customer satisfaction.* Homewood, IL: Business of One Irwin.

Roth, K., & Morrison, A. J. (1992). Implementing global strategy: Characteristics of global subsidiary mandates. *Journal of International Business Studies, Vol. 23, No. 4* , 715-735.

Roussel, P. A., Saad, K. N., & Erickson, T. J. (1991). *Third generation R&D: managing the link to corporate strategy (Vol. 6).* Boston: Harvard Business School Pres.

Rowe, W., & Morrow, J. L. (1999). A Note on the dimensionality of the firm financial performance construct using accounting, market, and subjective measures. *Revue Canadienne des Sciences de l'Administration, Vol. 16, No. 1* , 58–70.

Rudberg, M., & Wikner, J. (2004). Mass customization in terms of the customer order decoupling point. *Production Planning & Control, 15(4)* , 445-458.

Rumelt, R. P. (1991). How much does industry matter? *Strategic Management Journal, Vol. 12* , 167-185.

Rumelt, R. P. (1984). Toward a strategic theory of the firm. In R. Lamb, *Competitive strategic management* (pp. 556-570). Englewood Cliffs: NJ.

Rumelt, R. P., Schendel, D., & Teece, D. J. (1991). Strategic Management and Economics. *Strategic Management Journal, Vol. 12* , 5-29.

Runde, J. H. (1998). Assessing causal economic explanations. *Oxford Economic Papers, Vol. 50* .

Runeson, P., & Höst, M. (2009). Guidelines for conducting and reporting case study research in software engineering. *Empirical Software Engineering* , 131-164.

Rust, R., Zahorik, A., & Keiningham, T. (1995). Return on quality (ROQ): Making service quality financially accountable. *Journal of Marketing, 59(2)* , 58-70.

Sahal, D. (1986). *Patterns of Technological Innovation.* Reading, MA: Addison Wesley.

Salvador, F., Rungtusanatham, M., & Forza, C. (2004). Supply-chain configurations for mass customization. *Production Planning & Control, 15(4)* , 381-397.

Samson, D. (1997). Progress in total quality management: Evidence from Australasia. *International Journal of Quality Science, 2(4)* , 214–235.

Samson, D., & Terziovski, M. (1999). The relationship between total quality management practices and operational performance. *Journal of Operations Management, Vol. 17* , 393–409.

Sanchez, R. (1995). Strategic flexibility in product competition. *Strategic Management Journal, Vol. 16* , 135-159.

Sanchez, R. (1996). Strategic product creation: Managing new interactions of technology, markets, and organizations. *European Management Journal, Vol. 14* , 121-138.

Sanchez, R. (2002). Using modularity to manage the interactions of technical and industrial design. *Academic Review, 2(1)* , 8-19.

Sanchez, R., & Mahoney, J. (1996). Modularity, flexibility, and knowledge management in product and organization desig. *Strategic Management Journal, Vol. 17* , 63-76.

Sanchez, R., & Sudharshan, D. (1993). Real-time market research. *Marketing Intelligence & Planning* , 29-38.

Sanders, F. H. (2001). Financial rewards of mass customization. *MCPC 2001, Proceedings of the 2001 World Congress on Mass Customization and Personalization.* Hong Kong: Hong Kong University of Science and Technology.

Sanderson, S., & Uzumeri, M. (1995). Managing product families: The case of the Sony Walkman. *Research Policy* , 761-782.

Saunders, M., Philip, L., & Thornhill, A. (2009). *Research methods for busniness students.* Essex: Pearson Education Limited.

Sayer, A. (1992). *Method in social science: A realist approach.* London, UK.

Sayer, A. (2000). *Realism and social science.* London, UK.

Sayer99, A. (2000). *Realism and social science.* London, UK.

Schanz, G. (1982). *Organisationsgestaltung: Struktur und Verhalten.* München.

Schendel, D., & Hofer, C. (1979). *Strategic Management: A new view of business policy and planning.* Boston: Little, Brown.

Schertler, W. (1995). *Unternehmensorganisation, 6. durchgesehene Auflage.* München.

Schill, R. L., Bertodo, R. G., & McArthur, D. N. (1994). Achieving Success in Technology Alliances: The Rover Honda Strategic Collaboration. *R&D Management, 24(3)* , 261-327.

Schilling, M. A. (2000). Toward a general modular systems theory and its application to interfirm product modularity. *The Academy of Management Journal* , 312-334.

Schmalensee, R. (1989). Inter Industry Studies of Structure and Performance. In R. 1. Schmalensee, & R. D. Willig, *In Handbook of Industrial Organization, vol. 2* (pp. 951-1010). Amsterdam: North Holland.

Schultze, U., & Avital, M. (2011). Designing interviews to generate rich data for information systems research. *Information and Organization, Vol. 21* , 1-16.

Schumpeter, J. (1942). *Capitalism, Socialism and Democracy.* New York.

Scott, W. (1992). *Organizations: Rational, Natural and Open Systems.* Englewood Cliffs, NJ.

Seashore, S. E. (1983). A Framework for an Integrated Model of Organizational Effectiveness, Organizational Effectiveness: A Comparison of Multiple Models. In K. S. Cameron, & D. A. Whetten. New York.

Seidel, J. (1991). Methods and madness in application of computer technology to qualitative data analysis. In N. G. Fielding, & R. M. Lee, *Using comuters in qualitative research* (pp. 107-116). London: Sage.

Selladurai, R. S. (2004). Mass customization in operations management: oxymoron or reality?. *Omega, 32(4)* , 295-300.

Selznick, P. (1957). *Leadership in Administration.* New York.

Sharkey, W. W. (1982). Suggestions for a game-theoretic approach to public utility pricing and cost allocation. *The Bell Journal of Economics, Vol. 13, No. 1* , 57-68.

Sharman, G. (1984). The rediscovery of logistics. *Harvard Business Review, 62(5)* , 71-79.

Sheehan, N., & Foss, N. (2007). Enhancing the prescriptiveness of the resource-based view through Porterian activity analysis. *Management Decision Vol. 45, No. 3* , 450-461.

Sheehan99, & Foss, N. J. (2007). Enhancing the prescriptiveness of the resource-based view through Porterian activity analysis. *Management Decision, Vol. 45, No.3* , 450-461.

Shrivastava, P., & Souder, W. E. (1987). The strategic management of technological innovations: A review and a model. *Journal of Management Studies, 24* , 25-41.

Simon, H. A. (1991). Bounded rationality and organizational learning. *Organization Science, Vol. 2* , 125-134.

Simon, H. (1989). Die Zeit als strategischer Erfolgsfaktor. *zm, 59.Jg.* , 70-93.

Simon, H. (2012). *Hidden Champions - Aufbruch nach Globalia.* Frankfurt am Main.

Simsek, Z., Heavey, C., Veiga, J. F., & Souder, D. (2009). A typology for aligning organizational ambidexterity's conceptualizations, antecedents, and outcomes. *Journal of Management Studies, Vol. 46, No. 5* , 864-894.

Sitkin, S. B., Sutcliffe, K. M., & Schroeder, R. G. (1994). Distinguishing control from learning in total quality management: a contingency perspective. *Academy of management review, 19(3)* , 537-564.

Sittig, J. (1963). Defining quality costs. *Proceedings 7th EOQC Conference*, (pp. 9-17). Copenhagen.

Slater, S., & Narver, J. (1994). Does competitive environment moderate the market orientation performance relationship? *Journal of Marketing, 58* , 46-55.

Smith, A. (1970). *The Wealth of Nations.* London.

Smith, B. A., & Hesse-Biber, S. (1996). Users' Experiences with Qualitative Data Analysis Software Neither Frankenstein's Monster Nor Muse. *Social Science Computer Review, 14(4)* , 423-432.

Smith, P. G., & Reinertsen, D. G. (1992). Shortening the product development cycle. *Research Technology Managemenf, 35(3)* , 44-49.

Snow, C. C., & Hrebiniak, L. G. (1980). Strategy, distinctive competence, and organizational performance. *Administrative Science Quarterly, Vol. 25* , 317-336.

Snow, C., & Hambrick, D. (1980). Added measuring organizational strategies: some theoretical and methodological problems. *Academy of Management Journal, Vol. 5, No. 4* , 527-538.

Sommerlatte, T., & Mollenhauer, M. (1992). Qualität, Kosten, Zeit - das magische Dreieck. In *Management von Spitzenqualität* (pp. 26-36.). Wiesbaden: Betriebswirtschaftlicher Verlag Gabler.

Sommerlatte99, T., & Mollenhauer, M. (1992). Qualität-Kosten-Zeit-das magische Dreieck. In A. Little, *Das Management von Spitzenqualität* (pp. 26-30). Wiesbaden.

Sonnenberg, H. (1993). Balancing speed and quality in product innovation. *Canadian Business Review, 20* , 19-21.

Souder, W. E., & Chakrabarti, A. K. (1978). The R&D-marketing interface: Results from an empirical study of innovation projects. *IEEE Transactions on Engineering Managemenf, 25* , 88-93.

Spady, R., & Friedlander, A. (1978). Hedonic cost functions for the regulated truck industry. *Bell Journal of Economics, Vol. 9* , 159-179.

Spanos, Y. E., Zaralis, G., & Spyros, L. (2004). Strategy and industry effects on profitability: Evidence from greece. *Strategic Management Journal, Vol. 25* , 139-165.

Spender, J. C. (1989). *Industry recipes: The nature and sources of managerial judgment.* Oxford, UK.

Spender, J. C. (2013). Notes on the Theory of the Managed Firm (TMF). *Nonaka Centre for Knowledge and Innovation* (pp. 3-23). Marid, Spain: CUNEF.

Spender, J. C. (1994). Organizational knowledge, collective practice, and Penrose rents. *International Business Review, Vol. 3* , 353-367.

Spender, J. C., & Kessler, E. H. (1995). Managing the uncertainty of innovation: Extending Thompson (1967). *Human Relations, 48* , 35-56.

Stabell, C. B., & Fjeldstad, O. (1998). Configuring value for competitive advantage: On chains, shops, and networks. *Strategic Management Journal, Vol. 19* , 413-437.

Staehle, W. H., & Grabatin, G. (1979). Effizienz von Organisationen. *Die Betriebswirtschaft, 39. Jg., No 1b* , 89-102.

Stake, R. (1994). Case studies. In N. Denzin, & Y. Lincoln, *Hadbook of qualitative research* (pp. 236-247). Thousand Oaks, CA.

Stake, R. E. (1995). *The Art of Case Study Research.* Thousand Oaks, CA.

Stalk, G. E., & Shulman, L. (1992). Competing on capabilities: the new rules of corporate strategy. *Harvard Business Review, Vol. 70, No.2* , 57-69.

Stalk, G. (1993). Time and innovation. *Canadian business review, 20(3)* , 15-15.

Stalk, G., & Hout, T. M. (1990). *Competing against time: How time-based competition is reshaping global market.* New York: Free Press.

Stalk, G., Evans, P., & Shulman, L. (1992). Competing on capabilities: the new rules of corporate strategy. *Harvard Business Review, Vol. 70, No.2* , 57-69.

Starr, M. K. (1992). Accelerating Innovation. *Business Horizon, Vol. 35, No. 4* , 44-51.

Stone, E. (1978). *Research methods in organizational behavior.* Glenview, IL.

Stones, R. (1996). *Sociological reasoning: Towards a past-modern sociology.* New York, NY.

Sturgeon, T. J. (2002). Modular production networks: a new American model of industrial organization. *Industrial and corporate change, 11(3)* , 451-496.

Szekely, F., & Strebel, H. (2013). Incremental, radical and game-changing: strategic innovation for sustainability. *Corporate Governance, 13(5)* , 467-481.

Tabrizi, B., & Eisenhardt, K. M. (1993). Accelerating product development cycle time. *Paper presented at the annual meeting of the Academy of Management.* Atlanta, GA.

Taguchi, G. (1992). *Taguchi on Robust Technology Development.* ASME Press.

Takeuchi, H., & Nonaka, L. (1986). The new product development game. *Harvard Business Review, 64(1)* , 137-146.

Taylor, S., & Bogdan, R. (1984). *Introduction to research methods.* New York: Wiley.

Taylor, S., & Lyon, P. (1995). Paradigm lost: the rise and fall of McDonaldization. *International Journal of Contemporary Hospitality Management 7(2)* , 64-68.

Taylor, W. F. (1967). *The Principles of Scientific Management .* New York.

Teece, D. J. (2009). *Dynamic Capabilities and Strategic Management: Organizing for Innovation and Growth.* Oxford.

Teece, D. J. (1980). Economies of Scope and the Scope of the Enterprise. *Journal of Economic Behavior and Organization, Vol. 1* , 223-247.

Teece, D. J. (1982). Towards an economic theory of the multiproduct firm. *Journal of Economic Behavior & Organization, Vol. 3, No. 1* , 39-63.

Teece, D. (1986). Profitting from technological innovation: Implications for integration collaboration, licencing and public policy. *Research Policy, 15* , 285-305.

Teece, D., Pisano, G., & Shuen, A. (1997). Dynamic Capabilities and Strategic Management. *Strategic Management Journal, Vol. 18, No. 7* , 509-533.

Terninko, J. (1995). *Step-by-Step, Q. F. D. customer driven product design.* Dearborn, MI: American Supplier Institute.

Thamhain, H. J., & Wilemon, D. L. (1987). Drivers and barriers to effective engineering team performance. *IEEE Transactions on Engineering Management, 34* , 130-13.

The Strategic Planning Institute. (2012, May 27). *Overview PIMS Online*. Retrieved May 27, 2012, from PIMS Online: http://www.pimsonline.com

Therrien, L. (1989). The Rival Japan Respects. *Business Week, November 13* , 108-113.

Toffler, A. (1970). *Future shock.* New York, NY: Amereon Ltd.

Towner, S. J. (1994). Four ways to accelerate new product development. *Long Range Planning, 27(2)* , 57-65.

Tripsas, M. (1997). Surviving radical technological change through dynamic capability: Evidence from the typesetter industry. *Industrial and Corporate Change 6(2)* , 341-377.

Troxel, J. P. (2002). *Appreciative inquiry: An action research method for organizational transformation and its implications to the practice of group process facilitation.* Retrieved from http://appreciativeinquiry.case.edu/uploads/Troxel%20Appreciative%20Inquiry8-02.doc

Tsang, E. W. (2006). Behavioral assumptions and theory development: The case of transaction cost economics. *Strategic Management Journal, Vol. 27* , 999-1011.

Tseng, M. M., Jiao, J., & Merchant, M. E. (1996). Design for mass customization. *CIRP Annals-Manufacturing Technology, 45(1)* , 153-156.

Tseng, M., & Jiao, J. (2001). Mass Customization. In G. Salvendy, *Handbook of Industrial Engineering, 3rd edition* (pp. 684-709). New York, NY.

Tsoukas, H. (1989). The validity of idiographic research explanations. *Academy of Management Review, Vol. 14, No. 4* , 551-561.

Turner, T. E. (1969). An economic look at quality. *Quality Progress, Vol. 2, No. 4* , 16-20.

Tushman, M. L., & Anderson, P. (1986). Technological discontinuities and organizational environments. *Administrative Science Quarterly, 31* , 439-465.

Tversky, A., & Kahnemann, D. (1986). Rational choice and the framing of decisions. *Journal of Business, Vol. 59, No. 4* , 5251-5278.

Ulin, P. R., Robinson, E. T., & Tolley, E. E. (2005). *Qualitative methods in public health: A field guide for applied research.* San Francisco, CA: Jossey-Bass.

Utterback, J. M., & Abernathy, W. J. (1975). A dynamic model of process and product innovation. *Omega, 3(6)* , 639-656.

Van de Ven, A. H. (1986). Central problems in the management of innovation. *Management Science, 32* , 590-607.

Van Hoek, R. I., Vos, B., & Commandeur, H. R. (1999). Restructuring European supply chains by implementing postponement strategies. *Long Range Planning, 32(5)* , 505-518.

Vandermerwe, S. (2000). How increasing value to customers improve business results. *Sloan Management Review, 42 (Fall)* , 27–37.

VDW. (2013). *The German Machine Tool Industry in 2012.* Frankfurt a.M.: Verein Deutscher Werkzeugmaschinenfabriken.

Veludo-de-Oliveira, T. M., Ikeda, A. A., & Campomar, M. C. (2006). Discussing laddering application by the means-end chain theory. *The Qualitative Report, 11(4)* , 626-642.

Venkatraman, N., & Camillus, J. (1984). Exploring the concept of fit in strategic management. *Academy of Management Review, No. 9* , 513-525.

Venkatraman, N., & Ramanujam, V. (1986). Measurement of business performance in strategy research: A comparison of approaches. *Academy of Management Review, Vo. 11, No. 4* , 801-814.

Vesey, J. T. (1991). The new competitors: They think in terms of speed-to-market. *Academy of Management Executive, 5(2)* , 23-33.

Vinding, A. L. (2006). Absorptive capacity and innovative performance: A human capital approach. *Economics of Innovation and New Technology, 15(4-5)* , 507-517.

Von Hippel, E. (1994). “Sticky information” and the locus of problem solving: implications for innovation. *Management science, 40(4)* , 429-439.

Von Hippel, E. (1988). *Sources of Innovation.* New York: Oxford University Press.

Vygotzki, L. (1978). *Mind in society.* Cambridge, MA.

Walsh, J. P., & Fahey, L. (1986). The role of negotiated belief structures in strategy making. *Journal of Management, Vol. 12* , 325-338.

Wang, C. L., & Ahmed, P. K. (2007). Dynamic capabilities: a review and research agenda. *International Journal of Management Reviews, Vol. 9* , 31-51.

Watanabe, C., & Ane, B. K. (2004). Constructing a virtuous cycle of manufacturing agility: concurrent roles of modularity in improving agility and reducing lead time. *Technovation, 24(7)* , 573-583.

Weber, M. (1969). *The Theory of Social and Economic Organization.* New York.

Webster, F. E. (2002). *Market-driven management: how to define, develop, and deliver customer value (Vol. 28).* John Wiley & Sons Incorporated.

Wehrli, H. P., & Krick, M. (1998). Mit strategischen Netzwerken Kundennähe realisieren. *Absatzwirtschaft, 41(1)* , 62-68.

Weir, D., Marsh, C., & Greenwood, W. (2008). How organizational DNA works. In L. A. Costanzo, & R. B. MacKay, *Handbook of research on strategy and foresight* (pp. 219-233). Edward Elgar Publishing.

Welsh, E. (2002). Dealing with data: Using NVivo in the qualitative data analysis process. *Forum: Qualitative Social Research, 3(2)* .

Wernerfelt, B. (1984). A Resource-Based View of the Firm: Ten Years After. *Strategic Management Journal, Vol. 16, No.2* , 171-180.

Westbrook, R., & Williamson, P. (1993). Mass customization: Japan's new frontier. *European Management Journal, 11(1)* , 38-45.

Wheelright, S. C., & Clark, K. B. (1992). *Revolutionizing Product Development.* New York.

Wheelwright, S. C., & Sasser, W. E. (1989). New product development map. *Harvard Business Review* , 112-125.

White, R. E. (1986). Generic Business Strategies, Organizational Context and Performance: An Empirical Investigation. *Strategic Management Journal, Vol. 7* , 217-231.

White, R. (1986). Generic Business Strategies, Organizational Context and Performance: An Empirical Investigation. *Strategic Management Journal, Vol. 7* , 217-231.

Wikström, S. (1996). Value creation by company-consumer interaction. *Journal of Marketing Management, 12(5)* , 359-374.

Wildemann, H. (1992). Kosten- und Leistungsbeurteilung von Qualitätssicherungssystemen. *Zeitschrift für Betriebswirtschaft 62 (7)* , 761-782.

William Demant Holding. (2013). *The hearing healthcare market.* William Demant Holding.

Williamson, O. E. (1991). Comparative economic organization: The analysis of discrete structural alternatives. *Administrative science quarterly* , 269-296.

Williamson, O. E. (1979). Transaction-cost economics: The governance of contractual relations. *Journal ol Law and Economics, Vol. 22* , 233-261.

Willig, R. D. (1979). Multiproduct technology and market structure. *The American Economic Review, Vol. 69, No. 2* , 346-351.

Wilson, D. D., & Collier, D. A. (2000). An empirical investigation of the Malcolm Baldrige National Quality Award causal model. *Decision Sciences, 31(2)* , 361-383.

Withney, J. O. (1996). Strategic Renewal for Business Units. *Harvard Business Manager, July-August* , 84-89.

Womack, J. P., Jones, D. T., & Roos, D. (1992). *Die zweite Revolution in der Autoindustrie.* Campus-Verlag.

Woodruff, R. B. (1997). Customer value: the next source for competitive advantage. *Journal of the academy of marketing science, 25(2)* , 139-153.

Woodruff, R. B., & Gardial, S. (1996). *Know your customer: new approaches to customer value and satisfaction.* Cambridge, MA: Blackwell Publishers.

Worren, N., Moore, K., & Cardona, P. (2002). Modularity, strategic flexibility, and firm performance: A study of the home appliance industry. *Strategic Management Journal* , 123–1140.

Wright, P. (1987). A Refinement of Porter's Strategies. *Strategic Management Journal* , 93-101.

Wright, P., & Parsinia, A. (1988). Porter's Synthesis of Generic Business Strategies: A Critique. *Industrial Management, No.3* , 20-23.

Wright, P., Hotard, D., Kroll, M., Chan, P., & Tanner, J. (1990). Performance and multiplestrategies in a firm: evidence from the apparel industry . In B. V. Dean, & J. C. Cassidy, *Strategic management: methods and studies.* New York, NY.

Wright, P., Kroll, M., Pray, B., & Lado, A. (1995). Strategic Orientations, Competitive Advantage, and Business Performance. *Journal of Business Research, Vol.33* , 143-151.

Wright, P., Kroll, M., Pringle, C., & Johnson, J. (1990). Organization Types, Conduct, Profitability and Risk in the Semiconductor Industry. *Journal of Management Systems 2(2)* , 33–48.

Wright, P., Kroll, M., Tu, H., & Helms, M. (1991). Generic Strategies and Business Performance: An Empirical Study of the Screw Machine Products Industry. *British Journal of Management* , 57-65.

Yamin, S., Gunasekaran, A., & Mavondo, F. T. (1999). Relationship Between Generic Strategies, Competitive Advantage and Organizational Performance: An Empirical Analysis. *Technovation, Vol. 19* , 507-518.

Yi, Y. (1991). A Critical Review of Consumer Satisfaction. In V. A. Zeithaml, *Review of Marketing 1989.* Chicago: American Marketing Association.

Yin, R. K. (1994). *Case study research - Design and methods, applied social research methods series, Vol. 5.* Newbury Park, CA.

Zaheer, A., Gulati, R., & Nohria, N. (2000). Strategic Networks. *Strategic Management Journal, 21(3)* , 203-215.

Zajac, E. J. (1994). SMJ 1994 best paper prize to Birger Wernerfelt. *Strategic Management Journal, Vol. 16* , 169-170.

Zajac, E. J., & Shortell, S. M. (1989). Changing Generic Strategies: Likelihood, Direction, and Performance Implications. *Strategic Management Journal, Vol.10* , 413-430.

Zander, U., & Kogut, B. (1995). Knowledge and the speed of transfer and imitation of organizational corporations: An empirical test. *Organization Science, Vol. 6* , 76-92.

Zangwill, W. I. (1993). *Lightning Strategies for Innovation.* Lexington.

Zeithaml, C. P., & Fry, L. W. (1984). Contextual and Strategic Differences Among Mature Businesses in Four Dynamic Performance Situation. *Academy of Management Journal, Vol. 26, No. 4* , 841-860.

Zellner, M. (2011). Hybrid strategies and firm specific individualization: Theoretically linking generic concepts, activities and resources. *PhD-Symposium for Applied Sciences 2011 - Innovation in Engineering, Economics and Social Sciences*, (pp. 1-20). Munich.

Zellner, M., & Büssow, T. (2004). Das Unsichtbare sichtbar machen. *Harvard Business Manager, 9* , 49-57.

Zellner, M., & Büssow, T. (2005). *Unsichtbares, immaterielles Vermögen in sichtbare Wettbewerbsvorteile umsetzen.* Capgemini.

Zellner, M., & Butel, L. (2013). Hybrid Competitive Strategies and the Activty Based View of strategy. *2013 EURAM*, (pp. 1-41). Istanbul.

Zenger, T., & Hesterly, W. S. (1997). The Disaggregation of Corporations: Selective Intervention, High-Powered Incentives, and Molecular Units. *Organization Science* , 209-222.

Zipkin, P. H. (2001). The limits of mass customization. *MIT Sloan Management Review 42(3)* , 81-87.

Zirger, B. J., & Hartley, J. L. (1993). Accelerating product development: A conceptual model. *Paper presented at the annual meeting of the Academy of Management.* Atlanta, GA.

Zirger, B. J., & Maidique, M. A. (1990). A model of new product development: An empirical test. *Managemenf Science, 36* , 867-883.

Znaniecki, F. (1934). *The method of sociology.* New York, NY.

Zott, C., & Amit, R. (2010). Business Modell Design: An activity system perspective. *Long Range Planning, Vol. 43* , 216-226.