

## **Examining Top Management Commitment to TQM Diffusion using Institutional and Upper Echelon Theories**

Rameshwar Dubey  
Montpellier Business School  
Montpellier Research in Management  
2300 Avenue des Moulins  
34000 Montpellier France  
E-mail: rameshwardubey@gmail.com

Angappa Gunasekaran  
Charlton College of Business  
University of Massachusetts Dartmouth  
North Dartmouth, MA 02747-2300  
USA  
Tel: (508) 999-9187  
Fax: (508) 999-8646  
E-mail: agunasekaran@umassd.edu

Stephen J. Childe  
Plymouth Business School  
Plymouth University  
Plymouth, PL4 8AA  
United Kingdom  
E-mail: stephen.childe@plymouth.ac.uk

Thanos Papadopoulos\*  
Kent Business School  
University of Kent  
Sail and Colour Loft, The Historic Dockyard  
Chatham, Kent ME4 4TE  
United Kingdom  
E-mail: A.Papadopoulos@kent.ac.uk

Benjamin Hazen  
Department of Operational Sciences  
Air Force Institute of Technology, USA  
E-mail: benjamin.hazen@live.com

David Roubaud  
Montpellier Business School  
Montpellier Research in Management  
2300 Avenue des Moulins  
34000 Montpellier France  
E-mail: d.roubaud@montpellier-bs.com

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## **Abstract**

Total Quality Management (TQM) is an enduring approach for enhancing firm competitiveness. Still, there is dearth of research regarding organisational diffusion (post-adoption) of TQM. To address this gap, this research proposes a theoretical model rooted in institutional and upper echelon theories that explains TQM diffusion via top management commitment. We surveyed 300 senior quality managers representing 300 auto-components manufacturers in India to collect data to test the proposed model using variance based structural equation modelling (PLS-SEM). The findings suggest that institutional pressures significantly influence top management commitment to TQM. Subsequently, top management commitment influences organisational diffusion of TQM via acceptance, routinization, and assimilation. Managers can use the findings of this research to better understand how to assimilate TQM so that anticipated benefits can be fully realized.

**Keywords:** *Total Quality Management, Acceptance, Routinization, Assimilation, Institutional Theory, Upper Echelon Theory, Survey Methods, Factor Analysis, PLS-SEM*

## **1. Introduction**

The term “Total Quality Management” (TQM) denotes a set of tools, techniques, and procedures that are used to reduce or eliminate variation from a production process or service-delivery system (Ebrahimi and Sadeghi, 2013; Akgun et al. 2014; Cho et al. 2017). Organizations adopt TQM in hopes of improving efficiency, reliability, and quality (Steingard and Fitzgibbons, 1993; Waldman, 1994; Rahman, 2004; Lee et al. 2012), in support of performance and productivity goals (Iyer et al., 2013; Wruck and Jensen, 1994; Besterfield, 1995). TQM represents an overarching corporate focus toward meeting customer expectations and reducing costs resulting from poor quality by integrating quality management systems and processes with corporate culture (Berry, 1991; Handfield et al. 1999; Yusof and Aspinwall, 2000). Although there are numerous TQM success stories (Mohanty and Lakhe, 1998; Taylor and Wright, 2003; Jayaram et al. 2010; Zatzick et al. 2012; Hietschold et al. 2014; Ng et al. 2014; Valmohammadi and Roshanzamir, 2015; Donauer et al. 2015), there are some sceptics

who continuously question the role and impact of TQM (Corredor and Goni, 2011; García - Bernal and García-Casarejos, 2016). Indeed, failures of TQM implementation have been widely reported (see, Powell, 1995; Beer, 2003; Jun et al. 2004), and are largely attributed to inconsistent operationalization of TQM across different contexts (see, Spencer, 1994; Sousa and Voss, 2002; Bou-Llusar et al. 2009), non-participative assumptions (Korunka et al. 2003; Ng et al. 2015), and a failure to consider soft dimensions of TQM use and diffusion (Calvo-Mora et al. 2013, 2015; Dubey and Gunasekaran, 2015; Zeng et al. 2015). Fried (1995) further argue that the existing TQM literature have failed to discuss the inhibitive role of legal environment on TQM adoption. Further, King (1995) in response to Fried (1995) arguments, noted that resistance to change often leads to failure of TQM implementation. Jones and Seraphim (2008) further argues that the literature on TQM implementation in an unfavourable environment is scant. Hence, we may argue that despite of rich body of TQM literature, the studies explaining the diffusion (post-adoption) of TQM are scant except two studies (see, Ahire and Ravichandran, 2001; Osayawe Ehigie and McAndrew, 2005). This is unfortunate, as literature suggests that adoption and implementation of any innovation are only initial steps toward organisational diffusion, and full performance expectations cannot be realized until innovations are assimilated to some degree (Ahire and Ravichandran, 2001; Hung, 2007; Kiatcharoenpol et al. 2010; Hazen et al., 2012; 2014).

Our study addresses some of these gaps noted in previous studies (see, Ahire and Ravichandran, 2001; Hung, 2007; Kennedy and Fiss, 2009; Zeng et al. 2015). We suggest that a firm's top management (internal human agents) (Hambrick, 2007) play a significant role in the diffusion of TQM via motivating three stages of post-adoption diffusion: acceptance (ACP), routinization (RO) and assimilation (ASM). We also submit that the role that external institutional forces play with respect to the acceptance, routinization and assimilation phases of TQM diffusion remains largely unexplored.

We draw on Institutional Theory (DiMaggio and Powell, 1983; Westphal et al. 1997; Liang et al. 2007; Nair and Prajogo, 2009; Kauppi, 2013) and Upper Echelon Theory (Hambrick and Mason, 1984; Hambrick, 2007) to inform this research. We chose institutional theory because it describes how organisations shape themselves to gain legitimacy from important stakeholders (Sila, 2007, p.92). This is due in part to regulations, procedures, and structures imposed on organisations by the regulatory bodies (DiMaggio and Powell, 1983).

Institutional theory is a useful lens through which to examine innovation adoption and diffusion (Kennedy and Fiss, 2009). For instance, Sila's (2007) research sought to explain TQM and its impact on performance using three institutional factors and two contingency

factors. However, previous studies do not consider how organisations are seeking to adopt and diffuse TQM in response to external pressures. Further, institutional theory focuses on homogeneity and persistence, and not on the role of interest and agency in shaping action. To address this limitation, the role of intra-organisational dynamics needs to be included (Greenwood and Hinings, 1996); in this case, upper echelon theory can be useful.

The central premise of upper echelon theory is that executives' experiences, values and personalities greatly influence their interpretations of the situations they face and, in turn, affect their choices (Hambrick, 2007). As described in Section 2, by combining institutional theory and upper echelon theory, this paper extends the findings of Westphal et al., 1997; Ahire and Ravichandran, 2001; Sila, 2007; and Kennedy and Fiss, 2009. We suggest that top management commitment plays an intervening role with respect to how institutional pressures affect TQM diffusion in an organisation.

We address the following research question: *how do institutional factors affect top management commitment to TQM diffusion across their organisation?* Examining this question yields two primary contributions. First, this research provides unique insights into post-adoption TQM diffusion via organisational theories (i.e. institutional theory and upper echelon theory). We suggest that increased levels of diffusion may be a function of a firm's desire to appear legitimate to powerful constituents, peer organisations, or stakeholders outside the organisation (Abrahamson, 1991,1993; DiMaggio & Powell, 1983; Kennedy and Fiss, 2009). Second, we examine top management commitment as a potentially important mediator of the relationship between institutional pressures and diffusion of TQM. The integration of these theories and literature streams contributes to building theory with respect to the diffusion of management innovations such as TQM.

The remainder of the article is organized as follows. In the next section, we provide a brief background of the literature on TQM. Then, the theoretical framework and research hypotheses are developed and presented. Subsequent sections describe the constructs and their operationalization, outline the data collection and analysis methods, and present the findings. We then discuss the theoretical and managerial implications of our findings, and end with limitations and future research directions.

## **2. Organizational theories and total quality management research**

Literature suggests that organisational theories offer a holistic understanding of the diffusion of innovations (Damanpour, 1987; Sila, 2007). Organisational factors including functional differentiation, specialisation, administrative intensity, organisational size, organisational

slack, and others are shown to affect adoption of administrative innovations (Damanpour, 1987). Weber (2009) argues that organisational theories are those that address structural organisation and basic scientific fundamentals that serve to increase measures of management efficacy. Hence, if we consider TQM as an innovative means through which to improve structural and process elements within the firm, then organisational theories have the potential to inform TQM research. The use of organisational theories such as institutional theory and contingency theory may provide a better explanation of the diffusion process of TQM. A list of the prominent organisational theories used in TQM research is shown in Table 1.

**Table 1: Organisational theories used in TQM research**

| <b>Organisational theory</b>                        | <b>Literature</b>   |
|---|---|
| Resource Based View<br>(Barney, 1991; Grant, 1991)  | Powell (1995); Tena et al. (2001); Ruiz-Carrillo and Fernández-Ortiz (2005); García-Bernal and García-Casarejos (2014). |
| Institutional theory<br>(DiMaggio and Powell, 1983) | Westphal et al. (1997); Young et al. (2001); Ketokivi and Schroeder (2004); Sila (2007); Kennedy and Fiss (2009).       |
| Contingency Theory<br>(Duncan, 1972; Miller, 1992)  | Silvestro (2001); Sila (2007); Jayaram et al. (2010); Zatzick et al. (2012).  |
| Upper Echelon Theory<br>(Hambrick and Mason, 1984)  | Ahire and Ravichandran (2001); Young et al. (2001); Soltani (2005); Das et al. (2011).                                  |

The RBV asserts that an organisation can achieve competitive advantage by creating bundles of strategic resources and/or capabilities (Barney, 1991). Powell (1995) argues using RBV logic that TQM is not readily imitable. Hence, TQM may provide competitive advantage to the organisations (Kiatcharoenpol et al. 2010). However, the RBV does not necessarily consider properties of resources and resource markets to explain enduring firm heterogeneity (Oliver, 1997). Ling-Yee (2007, p.360) argues that RBV suffers from context insensitivity. This suggests that it is unable to identify the conditions under which the resources or capabilities may be most effective or valuable. Contingency theory suggests that organisations must adapt depending on the environmental conditions in which they exist (Donaldson, 1999). Duncan (1972) argues that successful organisations choose structures and process characteristics that “fit” the degree of uncertainty in their environment.

To address the somewhat static nature of the RBV, many scholars have proposed contingent RBV (CRBV). The CBRV may help to evaluate the extent to which different organisational resources or capabilities may provide value (Aragón -Correa and Sharma, 2003), to further enhance the value of the theory (Brush and Artz, 1999), and to identify different conditions which affect the utility of different resources or capabilities. Hence, contingencies have been identified as critical in the realisation of competitive advantage created by resources and capabilities, especially in relation to selection and deployment (Sirmon and Hitt, 2009). Contingency factors such as national context and culture, firm size, strategic context and other organisational variables have been considered within the TQM literature (Sila, 2007; Jayaram et al. 2010; Zatzick et al. 2012). However, the studies utilising RBV or CBRV for understanding innovative manufacturing practices or TQM diffusion do not typically capture the social context within which resource selections are embedded (i.e. firm traditions, network ties, regulatory pressures) (Ketokivi and Schroeder, 2004).

According to institutional theory, organisations shape themselves to increase stakeholders' perceived legitimacy of the firm (Sila, 2007, p.92). This is due in part to regulations, procedures, and structures imposed on organisations by regulatory bodies (DiMaggio and Powell, 1983). Sila (2007) further argues that organisations may be forced to change their structures due to governmental pressures, imitate the structures of other organisations because of competitive pressures, or conform to normative standards developed by accreditation bodies. Because there is no certification for TQM, there are no specific official guidelines for implementation. Therefore, organisations implementing TQM are likely to imitate early adopters to improve the quality of products or services in response to competitive pressures (Westphal, 1997; Sila, 2007). Kostova and Roth (2002) suggest that the adoption of TQM practices by a multinational corporations' subsidiaries highlights consideration of the broader institutional context as well as the more localized, relational context. Their study has important implications regarding alignment of practices, interests, agency and relational factors that increase levels of diffusion. For instance, organisations seek to adopt TQM in response to external pressures from stakeholders such as customers and shareholders. Hence, it is reasonable to assume that institutional pressures may influence the diffusion of TQM (Westphal et al. 1997; Dacin et al. 2002; Kostova and Roth, 2002; Kennedy and Fiss, 2009). King (1995) further argues that the TQM initiatives often fails, in case those organisations are resistant to the change. However, Dacin et al.'s (2002) critique of institutional theory suggests that the theory generally focuses on homogeneity and persistence, with less attention to the role of interest and agency in shaping action. To address these limitations, researchers have

incorporated the role of intra-organisational dynamics within the institutional theory framework (Greenwood and Hinings, 1996; Delmas and Toffel, 2008). Following this tradition, we employ not only institutional theory, but also upper echelon theory (Hambrick and Mason, 1984; Hambrick, 2007). The central premise of upper echelon theory is that executives' experiences, values and personalities greatly influence their interpretations of the situations they face and in turn, affect their choices (Hambrick, 2007). Top management support and commitment constructs have been used to increase understanding of the nomological network describing relationships between institutional factors and diffusion factors (Liang, et al., 2007). We employ the Top Management Commitment construct as the focal variable that enhances understanding of how and why TQM might diffuse within organizations.

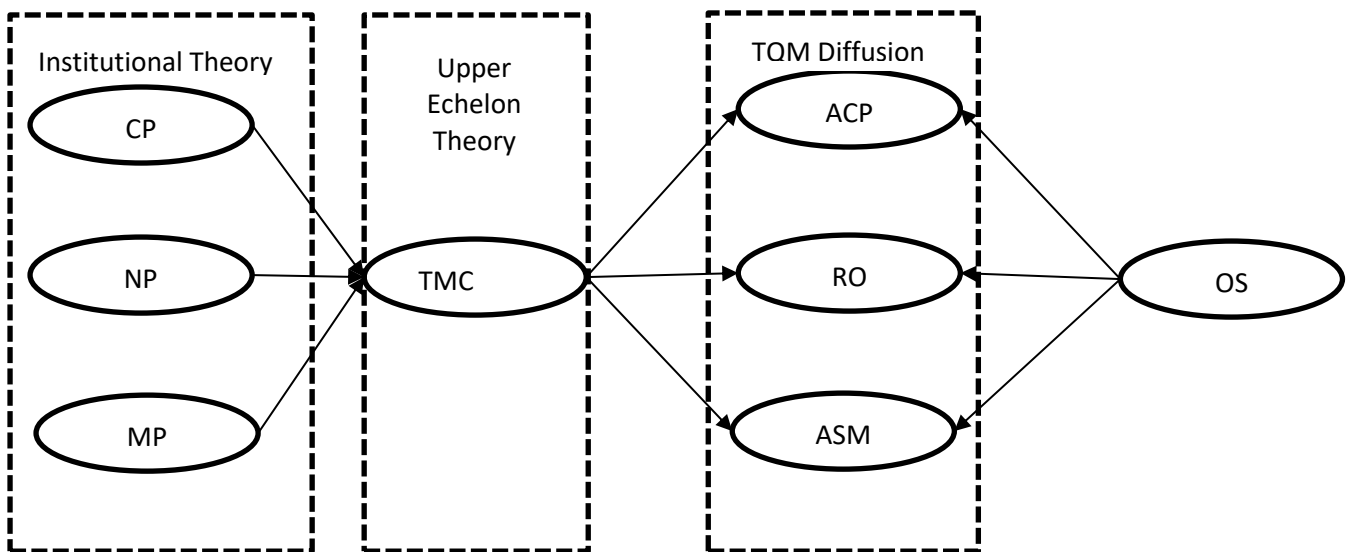
Westphal et al. (1997) observed that early adopters customize TQM practices for efficiency gains, while later adopters gain legitimacy from adopting the normative form of TQM programs. They suggest that institutional theory may offer better understanding to explain the diffusion of a management innovation or TQM. However, Westphal et al. (1997) have not illustrated how organisations that are engaging in TQM respond to the external pressures.

Kennedy and Fiss (2009) further discuss the diffusion of innovative practices using institutional theory by following Tolbert and Zucker's (1983) two-stage model. They argue that both early and later adopters are affected by needs for efficiency and legitimacy, which are generally complementary constructs. Early adoption is associated with opportunity framing and motivations to achieve gains, both economic and social, while later adoption is associated with threat framing and motivations to avoid losses, again in both economic and social terms. Their study indicates that the conventional two-stage model of innovation adoption – early adopters seeking efficiency and later adopters seeking legitimacy – fails to account for the complementarities regarding social and economic motivations for adoption. Instead, we suggest that the economic and social factors in combination may drive diffusion as it changes the motivation for adoption from a potential opportunity for early adopters to a more certain threat for later ones. These adoption motivations are related to subsequent implementation patterns. In addition, research indicates that the substantive importance of social considerations may differ less between early and later adopters than previously assumed. Prior studies (see Westphal et al. 1997; Sila, 2007; Kennedy and Fiss, 2009) have remained silent on how external pressures may influence TQM diffusion. In this research, we therefore extend previous

research (Westphal et al., 1997; Sila, 2007; Kennedy and Fiss, 2009) by examining TQM diffusion using institutional theory and upper echelon theory.

### 3. Model and hypotheses development

The theoretical model (Figure 1) comprises two primary elements: institutional pressures (of three types) and top management commitment (TMC). Consistent with the previous studies (see, Liang et al. 2007), top management commitment is proposed as the focal variable that translates external forces (institutional pressures) into diffusion of TQM. Based on this proposition, the model proposes six research hypotheses, each of which is developed further in this section.



Note: CP = Coercive Pressure; NP = Normative Pressure; MP = Mimetic Pressure;  
 TMC = Top Management Commitment;  
 ACP = Acceptance; RO = Routinization; ASM = Assimilation;  
 OS = Organization Size

**Figure 1: Proposed TQM Diffusion Model**

#### 3.1 Institutional Theory and Top Management Commitment

Sila's (2007) research sought to explain TQM and its impact on performance using three institutional factors and two contingency factors. Specifically, Sila (2007) used TQM implementation, ISO 9000 registration, country of origin, and the two contingency factors company size and scope of operations. Saremi et al. (2009) further argues the role of external consultants in successful implementation of TQM. In this research, we examine how institutional pressures affect post-adoption diffusion processes. Institutional theory posits that structural and behavioural changes in the organisation are driven less by competition and the



desire for efficiency, but more by the need for organisational legitimacy (DiMaggio and Powell, 1983; Liang et al. 2007; Lo et al. 2011; Kauppi, 2013; Zhao et al. 2013; Dubey et al. 2016). DiMaggio and Powell (1983) argue that the drive for legitimacy encourages organisations to embrace institutionalisation. This process of institutionalisation is termed ‘institutional isomorphism’ (see, DiMaggio and Powell, 1983; Liang et al. 2007; Kauppi, 2013). This literature suggests there are three mechanisms of institutional isomorphism. The first mechanism is *coercive pressure*, which refers to external pressures such as cultural expectations in the society, government regulations and policies, professional associations, and/or competitive necessity within the industry (Liang et al. 2007). In response to these external pressures, organisations develop ‘coercive isomorphism’. The second mechanism is *normative pressure*, which arises from professionalization, defined by DiMaggio and Powell (1983,p. 150) as “... *the collective struggle of members of an occupation to define the conditions and methods of their work, to control the production of the future member professionals, and to establish a cognitive base and legitimisation for their occupational autonomy ...*” Scholars argue that a pool of almost interchangeable employees (and hence normative isomorphism) is created through formal education and professional networks (see DiMaggio and Powell, 1983; Liang et al. 2007; Kauppi, 2013). The third mechanism is *mimetic pressure*, which refers to how organisations mimic actions of competitor organisations. This can often be attributed to environmental uncertainty. For instance, some organisations might develop mimetic isomorphism to give the appearance of being on par with or even ahead of competitors, even if they are not (DiMaggio and Powell, 1983). Indeed, it follows that coercive, normative, and mimetic pressures will influence top management commitment to the diffusion of TQM. Institutional theory can offer a useful lens through which to examine TQM diffusion, and therefore provides the theoretical rationale for our first three hypotheses. Next, we provide additional literature support to further develop each of these hypotheses.

### ***Coercive Pressures and Top Management Commitment***

Coercive pressure (CP) has been shown to influence adoption of technological and managerial innovations (i.e. Hart and Saunders, 1998; Hu and Quan, 2006). For instance, Guler et al. (2002) find that CP has a positive influence on the diffusion of ISO 9000 quality systems. It follows that CP might also play an important role in facilitating TQM diffusion. Literature on diffusion suggests that the role of CP can be highly contextual, and can take the form of myriad contextual factors such as those derived from relationships with suppliers, peer firms, rival firms, customers, state or local government regulatory norms, industry associations and

competitive structures (see, for example Abrahamson and Rosenkopf, 1993). This factor might also have indirect impacts on diffusion via intervening variables such as organisational culture, top management commitment, and others (Abrahamson and Rosenkopf, 1993). Liang et al. (2007) further argue how the mediating effects of TMC play an important role in translating CP into levels of diffusion. Hence, following similar logic we hypothesize:

*H1: Higher levels of coercive pressure are related to higher levels of top management commitment.*

### ***Normative Pressures and Top Management Commitment***

Normative pressure (NP) can stem from professional organizations, peer organizations, media outlets, and other channels that firms look to benchmark business practices and outcomes (Liang et al. 2007; Nair and Prajago, 2009). To this end, Lee and Dawes (2005) argue that normative pressures play a significant role in ERP adoption in a developing economies context. Similarly, Dubey et al. (2016) found that normative pressures play a significant role in motivating sustainable consumption and production practices. It follows that the effect of normative pressure on top management commitment and subsequent diffusion would also hold when considering practices similar in form and scope such as TQM.

Ng et al. (2015) cautions that firms should neither seek to implement TQM as per any specific set of guidelines, nor seek to implement TQM half-heartedly. Instead, firms should benchmark best performers and practices, and examine normative TQM profiles when driving their own TQM implementation. Hence, we it follows that NP will have significant influence on top management commitment to TQM. Thus, we hypothesize:

*H2: Higher levels of normative pressure are related to higher levels of top management commitment.*

### ***Mimetic Pressures and Top Management Commitment***

As with the other mechanisms of institutional theory, mimetic pressure (MP) has also been used as an antecedent to the adoption and diffusion of technological and management innovations (Liang et al., 2007; Nair and Prajago, 2009). This phenomenon arises from the tendency of organisations to mimic other organisations that are peers or aspiring peers. For instance, Liang et al., 2007 found that MP influences top management commitment to ERP systems, which then increases levels of diffusion of ERP. Scholars (see, DiMaggio and Powell, 1983; Liang et al. 2007; Kauppi, 2013; Dubey et al. 2016) note how organisations mimic other organisations within their industry with respect to how they adopt and use technological,

managerial, and production-related innovations and new practices. Although there is a dearth of research investigating the influence of MP on top management commitment and diffusion of TQM specifically, both institutional theory as well as TQM literature suggest that these influences should also hold in the context of TQM. Thus, we hypothesize:

*H3: Higher levels of mimetic pressure are related to higher levels of top management commitment.*

### **3.2 Top Management Commitment and TQM Diffusion**

Institutional theory suggests how coercive, normative, and mimetic pressures can affect how top managers choose to support the diffusion of innovations. However, the nature and intensity of this commitment to diffusion of practices like TQM can vary widely across adopting organizations. To account for this additional variance and increase predictive power and clarity, we draw on upper echelon theory. Liang et al. (2007) argues that human agents play a significant role in translating external pressures into desired managerial actions such as establishing policies or providing a conducive environment for the establishment and diffusion of new business practices.

Top management commitment might take the form of both top management belief and top management participation (Liang et al., 2017). With respect to this current research, top management belief refers to subjective assessments regarding the potential of TQM, while top management participation refers to the behaviour and actions performed to facilitate TQM diffusion (Ahire and Ravichandran, 2001). Hambrick and Mason (1984) further argue that organisational choices reflect the top management's values and cognitive bases. Hence, the positive beliefs of top managers about the usefulness of TQM result in certain managerial actions intended for diffusion of TQM. For instance, Liang et al. (2007) argue that the beliefs of the top management can offer visions and guidelines to the managers and business units about the opportunities and risks in diffusion of ERP. Hence, we may argue based on IS literature that TMC may significantly influence the TQM diffusion. We conceptualize diffusion following Hazen et al. (2012), in three stages: Acceptance (ACP), Routinisation (RO) and Assimilation (ASM). Although, we acknowledge that our conceptualization of diffusion in three stages stem from previous seminal work in the field of TQM diffusion (see, Ahire and Ravichandran, 2001). ACP has attracted significant attention from management scholars (see, Davis, 1989; Ahire and Ravichandran, 2001; Venkatesh et al. 2003; Hazen et al. 2012). ACP can be defined in the context of TQM as how well the organisation's constituents receive TQM. Hazen et al. (2012) have argued that once organisational constituents have accepted an

innovation such as TQM as a guiding philosophy, then the process of it being routinised within the organisation is initiated. Inspired by the definition of Zmud and Apple (1992), we define TQM routinization as the permanent adjustment of the organisations' governance systems to account for TQM. Drawing upon previous studies on institutional theory and innovation diffusion (see, Jarvenpaa and Ives, 1991; Purvis et al. 2001; Ahire and Ravichandran, 2001; Liang et al. 2007) we argue that top management commitment may contribute to the ACP, RO, and ASM. Thus, we hypothesize:

*H4: Higher levels of top management commitment are related to higher levels of ACP;*

*H5: Higher levels of top management commitment are related to higher levels of RO;*

*H6: Higher levels of top management commitment are related to higher levels of ASM.*

### **3.3 Control Variables**

We have based our arguments following Ahire and Ravichandran (2001), that OS may have significant influence on the diffusion process. Hence, in this study, we use measures of organisation size (OS) as control variables. To measure OS, we draw on Liang et al. (2007) and propose two measures: 'number of employees' and 'revenues'. Liang et al. (2007) note that large organisations are more resilient to hurdles that tend to slow down the diffusion process. Furthermore, decision making and execution can happen at a faster pace in smaller rather than larger organisations. Hence, we believe that the size of the organisation may have a significant influence on diffusion and should therefore be controlled for.

## **4. Research Methods**

### **4.1 Construct Operationalization and Measurement**

Based on how the constructs were conceptualized in previous research, we consider all constructs as reflective. We used a survey method to collect data, and we developed our instrument following Churchill's (1979) guidelines. To improve the validity and reliability of our constructs, we adopted two phases. In the first phase, multi-item constructs were adopted from prior studies. For instance, the measure of CP was adapted from previous studies (see Liang et al. 2007; Nair and Prajago, 2009; Colwell and Joshi, 2013; Dubey et al. 2016) to fit the context of this research. In this way, all constructs were drawn from existing literature (see Table 2).

**Table 2: Measures**

| <b>Construct</b>         | <b>Measure Derived From:</b>  | <b>Items Used in This Research</b>  |
|--------------------------|---|---|
| Coercive Pressures (CP)  | Liang et al. (2007); Nair and Prajago (2009); Colwell and Joshi (2013); Dubey et al. (2016) | <ol style="list-style-type: none"> <li>1. State Government requires our organisation to adopt TQM (CP1).</li> <li>2. The industry association requires our organisation to adopt TQM (CP2).</li> <li>3. The customers of our organisation require our organisation to adopt TQM (CP3).</li> </ol>   |
| Normative Pressures (NP) | Liang et al. (2007); Nair and Prajago (2009); Dubey et al. (2016)                           | <ol style="list-style-type: none"> <li>1. The extent to which your organisation's customers have adopted TQM (NP1).</li> <li>2. The extent to which suppliers of your organisations have adopted TQM (NP2).</li> <li>3. The extent to which professional bodies' promotion of TQM has influenced your organisation to adopt TQM (NP3).</li> </ol> |
| Mimetic Pressures (MP)   | Liang et al. (2007); Nair and Prajago (2009); Dubey et al. (2016)                           | <p>Our main competitors who have adopted TQM:</p> <ol style="list-style-type: none"> <li>1. Have greatly benefitted(MP1)</li> <li>2. Are favourably perceived by others within the same industry (MP2).</li> <li>3. Are favourably perceived by the customers (MP3).</li> <li>4. Are favourably perceived by the suppliers (MP4).</li> </ol>      |

|  |  |  |
|--|--|--|
| <p>Top Management Commitment (TMC)</p> | <p>Ahire et al. (1996); Ahire and Ravichandran (2001); Liang et al. (2007); Mokhtar and Yusof (2010); Overstreet et al. (2014); Dubey and Gunasekaran (2015)</p> | <ol style="list-style-type: none"> <li>1. TQM has potential to provide significant business benefits to the organisation (TMC1).</li> <li>2. TQM will create significant competitive arena for the organisation (TMC2).</li> <li>3. The senior management of your organisation have formulated a strategy for the organisation's use of TQM (TMC3).</li> <li>4. The senior management of your organisation share the TQM vision with all stakeholders of the organisation (including you) (TMC4).</li> <li>5. The senior management has established the performance metrics to monitor the TQM project (TMC5).</li> <li>6. The senior management recognizes the contribution of the partners engaged in TQM project (TMC6).</li> </ol> |
| <p>Acceptance (ACP)</p>                | <p>Ahire and Ravichandran (2001); Hazen et al. (2012)</p>  | <ol style="list-style-type: none"> <li>1. The degree to which you believe that embracing TQM philosophy helps you enhance your job performance (ACP1).</li> <li>2. The degree to which you and your colleagues associate with the TQM philosophy (ACP2).</li> <li>3. The degree to which you believe than an organisational and technical infrastructure exists to</li> </ol>  |

|                    |  |   |
|--------------------|--|---|
|                    |  | support use of the innovation (ACP3).   |
| Routinization (RO) | Ahire and Ravichandran (2001); Hazen et al. (2012) | <ol style="list-style-type: none"> <li>1. The degree to which procedures are established for replacement of old equipment (RO1).</li> <li>2. The degree to which the TQM process is supported by the normal budgeting (RO2).</li> <li>3. There is a dedicated organisational unit for TQM (RO3).</li> <li>4. The degree to which supplies and repairs can be obtained according to organisational procedures (RO4).</li> <li>5. The degree to which organisation can hire and retain qualified people (RO5).</li> </ol> |
| Assimilation (ASM) | Liang et al. (2007); Hazen et al. (2012)           | <ol style="list-style-type: none"> <li>1. Volume of use: The extent to which your organisation has embraced TQM philosophy as guiding principles in every department (%) (ASM1).</li> <li>2. Diversity: number of functional areas that are guided by TQM philosophy in your organisation (ASM2).</li> <li>3. Depth: For each functional area indicated by you, identify the level at which the TQM philosophy is used: (a) Operations; (b) Management; (c) Decision making (ASM3).</li> </ol>                          |

To enhance the validity of the chosen measures, we interviewed twelve managers who have ten or more years of experience with TQM and asked them to provide feedback on the questionnaire. To assess the clarity of the questionnaire items and their satisfactory adaptation

to the context of this research, we asked the twelve managers to assess the questionnaire in the presence of the researchers so that they could provide direct feedback and corrections could be discussed and implemented in near real-time. Based on this procedure, we clarified the constructs and the associated measurement items. Consistent with the call for research in operations and supply chain management literature (Flynn et al.1990; Malhotra and Grover, 1998; Fawcett et al. 2014), such additional analysis provides a useful method to validate items borrowed from other studies. Secondary data were collected from annual reports for those organisations comprising our sample frame. This strategy has helped us: (i) overcome the limitations of the reported literature and in-depth interviews by improving the generalizability of the measurement scales; and (ii) help to reduce key informant bias and common method bias (see, Roth, 2007; Chan et al. 2016).

The measures listed in Table 2 were measured on a five-point Likert scale with anchors ranging from strongly disagree (1) to strongly agree (5). With respect to the dependent variables (TQM acceptance, routinization, and assimilation), respondents were asked to indicate the volume of use (i.e. the extent to which organisation has embraced TQM philosophy as guiding principles in every department), diversity of use (i.e. number of functional areas in an organisation that are guided by TQM philosophy), and depth of use (for each functional area, the level at which the TQM philosophy guides operation and decision making).

## **4.2 Sample and Data Collection**

The Indian auto-component manufacturing sector was chosen as the sample frame for two primary reasons. First, auto-component manufacturers in India have widely adopted TQM and second, the Indian auto-component sector is one of the leading sectors in the country and contributes almost 7% to the nation's GDP (IBEF, 2015). Facing competition from countries like China, Malaysia, Indonesia, Vietnam and South Korea, Indian auto-component manufacturers are motivated to deliver high quality products at low cost (Iyer et al. 2013).

We gathered data by distributing 1100 questionnaires among 1100 auto-component manufacturing organisations situated in all four (north, south, east, and west) regions of India. Company information was extracted from two databases: the ACMA (Automotive Components Manufacturers Association of India) and Dun & Bradstreet. Following prior studies (Bowen et al. 2001; Menor and Roth, 2007; Chan et al. 2016), a package containing the structured questionnaire, a cover letter explaining the research, and a self-addressed pre-paid envelope was mailed to the senior quality manager at each auto-component manufacturing



organisations that has adopted TQM in some way (as uncovered via our initial background research and selection of participants).

We made follow up telephone calls to all potential participants after two weeks to ensure the package arrived and to clarify any questions about the research. After the first wave of mailing, 185 questionnaires were received. At five weeks, we again sent packages to those who had not responded. 115 questionnaires were subsequently returned for an overall response rate of 27.3%. Altogether, 300 completed questionnaires were received (please refer to Appendix 1 for demographics). All the returned surveys had been filled out properly, and there were no issues that would require any of them to be removed from the analysis. We attribute the quality of the survey responses to the communication medium (mailed survey via post vice online-based survey) and the follow-up telephone calls.

### **4.3 Non-response Bias**

Guide and Ketokivi (2015) argue that non-response bias (NRB) is an issue associated with survey-based research. We do not claim to have eliminated the NRB in our study but we have used mix of classical and recent arguments to ensure that the effect of NRB on our data is limited. We used an extrapolation method to test non-response bias as suggested by Armstrong and Overton (1977). The comparisons between early and late responses showed no statistical differences at  $p < 0.05$ , indicating that non-response bias is not a significant threat to validity. Next, following Fawcett et al.'s (2014) arguments (c.f. Wagner and Kemmerling, 2010), we have also compared the demographics of the respondents and the non-respondents via Dun & Bradstreet and found that our sample is statistically homogenous with the broader population.

## **5. Data Analyses and Results**

We used Warp PLS 5.0, which relies on the Partial Least Squares (PLS) method, to estimate the hypothesized relationships (Kock, 2015). Various scholars argue that PLS is a preferred method for exploratory research in that the resulting parameter estimates are robust to artefacts that commonly arise from the employment of new or revised measures in new sample frames (Henseler et al. 2009; Hair et al. 2012; Peng and Lai, 2012; Henseler et al. 2014; Filho et al. 2016; Leyer et al. 2017). Indeed, the proposed relationships between constructs in this study are guided by complementary yet distinct theories that are rarely examined in aggregate in the literature. Given these reasons, we chose PLS as the most appropriate method for data analysis in this study (Peng and Lai, 2012; Moshtari, 2016).

In conducting the model estimation, we followed two stages recommended by Peng and Lai (2012), examining validity and reliability of the measurement model and analysing the structural model. The appendix 2 & 3, illustrates the list of steps and criteria within two stages of PLS application in the model with reflective constructs.

### **5.1 Measurement Model**

To assess the measurement model, we examined each construct's individual-item reliabilities, the convergent validity and discriminant validity of the measures associated with each construct. Appendix 2 provides an overview of the factor loadings ( $\lambda$ ), scale construct reliability (SCR), and average variance extracted (AVE) of the reflective constructs. We found that the factor loadings were all greater than 0.5, the SCRs were calculated to be greater than 0.7, and the AVE for each construct was greater than 0.5 (Peng and Lai, 2012). Appendix 3 presents the correlations between paired constructs, and the leading diagonal of the matrix shows the square-root of the AVE of each construct. All measures indicate adequate discriminant validity (Fornell and Larcker, 1981; Peng and Lai, 2012).

### **5.2 Common Method Bias (CMB) and Endogeneity**

Podsakoff and Organ (1986) suggest that when using single-source data, there is potential for CMB. To address CMB in our study, we followed the suggestion of Podsakoff et al. (2003) and performed Harman's one factor test to assess whether a single latent factor would account for all the theoretical constructs. The results from this test showed that the single factor explains 42.12 percent of total variance, demonstrating that CMB is not a significant threat. However, following guidance from a recent editorial note (Guide and Ketokivi, 2015) we understand that Harman's single factor test has its own limitations (c.f. Ketokivi and Schroeder, 2004). Thus, to ensure that CMB is not a major concern, we further used a method variance (MV) marker to assess common method variance (Lindell and Whitney, 2001). Using this method, we chose the five-item scale that measured routinization, which provided the lowest positive correlation ( $r=0.05$ ) between the MV marker and other variables, to adjust the construct correlations and statistical significance (Lindell and Whitney, 2001). None of the significant correlations became non-significant after adjustment. To even further assess CMB, we compared the fit between the one-factor model, the measurement model with only traits, and the measurement model with both traits and a method factor (Dong et al. 2016). The one-factor model yielded a chi-square ( $\chi^2=2001.83$ ,  $p<0.000$ ), that was significantly worse than that of the measurement model with only traits. The chi-square of the measurement model with both traits and a method

factor ( $\chi^2=386.94$ ;  $p<0.000$ ) did not significantly improve that of the measurement model with only traits. Thus, we further conclude that CMB is not a serious threat to the validity of the findings.

Before testing the research hypotheses, we tested for endogeneity of the exogenous variable in our model. CP, NP and MP are conceptualized as exogenous model variables to the acceptance, routinization and assimilation but not the other way around, in accordance with the literature. Thus, endogeneity is unlikely to be a concern in this context. We further tested empirically whether the endogeneity was an issue by conducting the Durbin-Wu-Hausman test (Davidson and MacKinnon, 1993). We first regressed CP, NP and MP on all controls and TMC, then used the residual of the regression as an additional regressor in our hypothesized equations. The parameter estimate for the residual was not significant, indicating that the CP, NP and MP were not endogenous in our setting, consistent with its conceptualization.

### 5.3 Model Fit and Quality Indices

Average path coefficient (APC), Average R - squared (ARS), and Average block VIF (AVIF) are the three-model fit and quality indices estimated in this study, which are shown in Table 3. Relationships between the latent variables are predicted by these indices. The values of APC and ARS are found to be significant for the model as the p values are coming less than 0.05.

**Table 3: Model fit and quality indices**

| Model Fit & Quality Indices    | Value from Analysis | Acceptable if                 | References                  |
|--------------------------------|---------------------|-------------------------------|-----------------------------|
| Average Path Coefficient (APC) | 0.367, $p < .001$   | $p < .05$                     | Rosenthal and Rosnow (1991) |
| Average R - squared (ARS)      | 0.525, $p < .001$   | $p < .05$                     |                             |
| Average block VIF (AVIF)       | 2.201               | $\leq 5$ , ideally $\leq 3.3$ | Kock (2015)                 |

According to Tenenhaus et al. (2005), there can be a single value for the goodness of fit analysis in the case of PLS analysis. We have calculated the goodness of fit value based on the  $R^2$  and AVE estimates. We have also calculated the goodness of fit by using the average value of  $R^2$  and the geometric mean of AVE as per the following formula:

$$GoF = \sqrt{(Average R^2 * Geometric mean of AVE)}$$

The goodness of fit value as calculated with the above formula for our current model is 0.629. According to Wetzels et al. (2009), baseline values for the relative fit of GoF estimate are 0.36

= large, 0.25 = medium, and 0.1 = small. Thus, based on these values, the GoF of our model is large.

### 5.4 Hypotheses Testing

PLS does not assume a multivariate normal distribution (Hair et al. 2016). Hence, traditional non-parametric based significance tests are inappropriate. PLS uses a bootstrapping technique to estimate standard errors and the significance of parameter estimates (Hair et al. 2011; Peng and Lai, 2012). The PLS path coefficients and p-values for the model (Figure 2) are reported in Table 4. The estimated path coefficients are interpreted like standardised beta coefficients in OLS (ordinary least squares) regression. For instance, based on the results presented below, if the level of CP changes by 1.0, we would expect TMC to change by 0.20, holding all other independent variables constant.

As shown in Table 3, the path from CP to TMC ( $\beta=0.20$ ;  $p<0.01$ ) is significant. Similarly, the paths NP→TMC (H2) ( $\beta=0.14$ ;  $p<0.01$ ) and MP→TMC (H3) ( $\beta=0.68$ ;  $p<0.01$ ) are found to be supported. Next, the paths joining TMC→ACP (H4) ( $\beta=0.84$ ;  $p<0.01$ ), TMC→RO (H5) ( $\beta=0.79$ ;  $p<0.01$ ) and TMC→ASM (H6) ( $\beta=0.45$ ;  $p<0.01$ ) are found to be supported.

Interestingly, the control variables for OS were found to have no significant influence on ACP ( $\beta=-0.00$ ;  $p=0.49$ ), RO ( $\beta=-0.11$ ;  $p=0.06$ ) or ASM ( $\beta=-0.10$ ;  $p=0.08$ ) in this model. We interpret these observations that the OS provides no additional power to predict ACP, RO and ASM in a model that already includes the variables CP, NP, MP, and TMC.

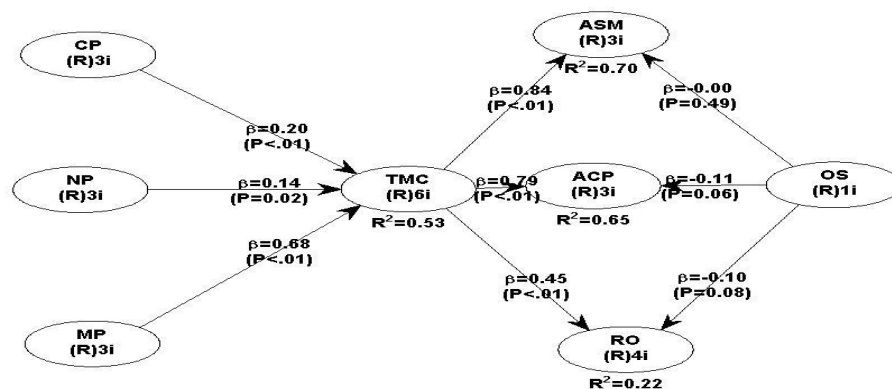


Figure 2: Final Causal Model

**Table 4: Hypothesis Testing Results**

| Hypothesis | Effect of | on  | $\beta$ | p-value | Results   |
|------------|-----------|-----|---------|---------|-----------|
| H1         | CP        | TMC | 0.20    | <0.01   | supported |
| H2         | NP        | TMC | 0.14    | <0.01   | supported |
| H3         | MP        | TMC | 0.68    | <0.01   | supported |
| H4         | TMC       | ACP | 0.84    | <0.01   | supported |
| H5         | TMC       | RO  | 0.79    | <0.01   | supported |
| H6         | TMC       | ASM | 0.45    | <0.01   | supported |

Note: CP = Coercive Pressure; NP = Normative Pressure; MP = Mimetic Pressure;

TMC = Top Management Commitment;

ACP = Acceptance; RO = Routinization; ASM = Assimilation

To evaluate the explanatory power of the model, we examined the  $R^2$  value of the endogenous constructs. As shown in Table 5, the  $R^2$  for TMC, ACP, RO and ASM are 0.53, 0.70, 0.65 and 0.22, respectively, which are moderately strong (Chin, 1998). To evaluate the effect size of each predictor construct, we use Cohen  $f^2$  formula (Cohen, 1988).  $f^2$  is equal to the increase in  $R^2$  relative to the proportion of variance that remains unexplained in the endogenous latent variable. According to Cohen (1988)  $f^2$  values of 0.35, 0.15 and 0.02 are considered large, medium and small. Consequently, the effect sizes of CP, NP and MP on TMC are 0.058, 0.071 and 0.399 (Table 5). Similarly, the effect sizes of TMC on ACP, RO and ASM are 0.704, 0.627 and 0.209 (Table 5).

To further assess the model's predictive capability, we calculated Stone-Geisser's  $Q^2$ . The  $Q^2$  for endogenous constructs is 0.378, 0.647, 0.216 and 0.701 (Table 5) for TMC, ACP, RO and ASM, respectively. Because these values are greater than zero, the model indicates an acceptable predictive relevance (Peng and Lai, 2012).

**Table 5:  $R^2$ , Prediction and Effect Size**

| Construct | $R^2$ | $Q^2$ | $f^2$ in relation to |     |    |     |
|-----------|-------|-------|----------------------|-----|----|-----|
|           |       |       | TMC                  | ACP | RO | ASM |
| CP        | -     | -     | 0.058                |     |    |     |
| NP        | -     | -     | 0.071                |     |    |     |
| MP        | -     | -     | 0.399                |     |    |     |

|     |      |       |  |       |       |       |
|-----|------|-------|--|-------|-------|-------|
| TMC | 0.53 | 0.378 |  | 0.704 | 0.627 | 0.209 |
| ACP | 0.70 | 0.647 |  |       |       |       |
| RO  | 0.65 | 0.216 |  |       |       |       |
| ASM | 0.22 | 0.701 |  |       |       |       |

Note: CP = Coercive Pressure; NP = Normative Pressure; MP = Mimetic Pressure;

TMC = Top Management Commitment;

ACP = Acceptance; RO = Routinization; ASM = Assimilation

## 6. Discussion

In this study, we investigated to what extent top management commitment supports TQM diffusion in consideration of institutional pressures. The empirical results highlight the institutional pressures (i.e. CP, NP and MP) and TMC as strong predictors of TQM diffusion. The data analysis suggests that CP, NP and MP have significant influence on the TMC to adopt TQM. However, MP has significant influence ( $\beta=0.68$ ;  $p<0.01$ ). Secondly, the effect size of the MP on TMC was found to be 0.399 which is considered high as per Cohen's (1988) suggestions. This finding is consistent with Westphal et al. (1997) who argue that the late adopters would try to imitate the early implementers. However, Westphal et al. (1997) and Sila (2007) remain silent on the other two pressures (coercive and normative). In our study, we have examined the combined effect of CP, NP and MP under the mediating effect of TMC on the three stages of TQM diffusion (i.e. ACP, RO and ASM). The study findings provide an interesting insight that CP, NP and MP in combination explain 53 percent of total variation in the TMC for TQM adoption. TMC further explains 70 percent of total variation in the ACP, 65 percent of total variation in RO and 22 percent of the variation in ASM. Hence, we argue that TMC plays a significant role in the TQM diffusion, which is an important contribution to the literature.

Furthermore, in this research we illustrated the use of institutional theory and upper echelon theory to explain TQM diffusion; this is lacking from previous studies (see Westphal et al. 1997; Sila, 2007 and Kennedy and Fiss, 2009). Given the limitations of institutional theory, in this context, we further extended the TQM diffusion literature using a combination of institutional theory and upper echelon theory to improve the explanatory power of the model.

### 6.1 Theoretical contributions

The literature has focused on the diffusion processes (Kennedy and Fiss, 2009), imitation processes (DiMaggio & Powell, 1983) and trendsetters (Abrahamson, 1996). However, diffusion (post-implementation) processes have seen less attention. Our study addressed this gap using institutional theory, upper echelon theory, and top management commitment (Ahire and Ravichandran, 2001; Hung, 2007; Zeng et al. 2015). Furthermore, our research adds to the literature discussing the motivations of adoption (Kennedy and Fiss, 2009) from a sociological perspective, emphasizing the social embeddedness of organisations and motivations that stem primarily from a desire to appear legitimate to powerful constituents, peer organisations, or outside stakeholders (Abrahamson, 1991; DiMaggio & Powell, 1983; Kennedy and Fiss, 2009). We draw on the study of Tolbert and Zucker (1983) and argue that early adopters seek technical gains from adoption, but later adopters are primarily interested in the social benefits of appearing legitimate without compromising on economic gains. In this way, we have tried to extend the previous contribution to the said literature (see, Ahire and Ravichandran, 2001). The overall  $R^2$  of our model is 0.525 in comparison to the Ahire and Ravichandran (2001), TQM diffusion model whose  $R^2=0.23$ . Our model higher  $R^2$ , could be attributed to our attempt to explain the TQM diffusion using integration of institutional and upper echelon theories. Two key aspects of this study signify our contributions to the theory of TQM diffusion.

First is the focus on post-implementation diffusion in the context of TQM. Our findings extend the work of Westphal et al. (1997) and Sila (2007) from the adoption phase to the three-stage diffusion stage of TQM. Considering that TQM may be challenging to assimilate among various organisational elements (Kennedy and Fiss, 2009), our findings are particularly noteworthy. The finding significant role played by the institutional forces may be interpreted as guiding the diffusion process, that is, the CP, NP and MP influence the behaviour of the top management and thus influence the TQM diffusion.

Second, this study integrates institutional forces, upper echelon theory, and the influence of top management on the diffusion process into one model and reconciles what had previously been presumed to independent in literature. In existing literature, the top management commitment and three forces of the institutional influence are rarely examined in the existing TQM literature. In this study, we illustrate that all the external forces impact TQM diffusion through their influence on the behaviour of the top management toward TQM.

## **6.2 Managerial Implications**

As our study is focused on the post-adoption phases of diffusion, top managers should understand the level of their involvement that will be required even after a successful adoption of TQM in their organisation. Said another way, after the adoption decision has been made and

the new managerial innovation begins to be employed, top managers must remain actively engaged until the innovation is fully diffused if the organization is to achieve the desired results. Hence, our study has several implications for TQM adoption.

Firstly, our empirical findings demonstrate the mediating role of TMC between external pressures and three stages of the TQM diffusion and thus support the notion that the top managers and the organisations need to align their organisational strategies to exploit the external pressures in achieving desired success through TQM diffusion. If top management are not committed to instituting meta-structuring activities, the diffusion is likely to suffer. Fried (1995) argues that the existing TQM literature, have failed to discuss the inhibitive role of the legal environment on TQM adoption. However, contrary to this popular view held by several managers we have observed that the CP under the mediating effect of TMC, have significant and positive effect on ACP, RO and ASM. The findings of our study support the King (1995) response to the Fried (1995) arguments. Hence, our results offer some useful guidance to those managers who have often criticized the legal environment for the failure of TQM initiatives.

Secondly, our study results support the previous arguments (see Ahire and Ravichandran, 2001; Hung, 2007) that how collaboration between focal organisation and customers/ suppliers and influence of the external professional bodies shape the TMC. In turn the TMC, have significant and positive effect on ACP, RO and ASM. Although, our findings support some of the important findings (see, Ahire and Ravichandran, 2001; Cho et al. 2017). However, the organisations specially in the emerging economies have failed to align their organisational strategies as per prevailing environment. Hence, our study results further support the Ahire and Ravichandran (2001) arguments that organisation which seek to derive significant and positive benefits from TQM diffusion, the managers need to focus on their customers, suppliers and must maintain good association with professional bodies to ensure that organisational practices are in line to avoid any confusion.

Thirdly, our study results provide empirically tested results that the perceptions of the customers, suppliers and the industry has significant and positive influence on the TMC which in turn has positive effect on the ACP, RO and ASM. Hence, managers and the organisation must together continuously engage with the customers, suppliers and industry to get regular inputs on their product and service quality. In turn, it further helps to create positive perception of the organisation.

## **7. Conclusion, limitations and future research directions**



Drawing broadly on institutional theory, upper echelon theory and TQM diffusion literature, we developed a theoretical model to explain TQM diffusion in an organisation. Our theoretical model reconciles the independent contributions of two well established streams of literature (i.e. the influence of TMC on TQM diffusion and role of institutional pressures on TQM diffusion). The findings of our study make a useful contribution to the existing TQM diffusion literature and provide useful guidelines to the practitioners.

Although, we designed and controlled the study to reduce risks to validity and reliability, it is important to emphasize research limitations that might affect the research findings. Fortunately, most of these limitations can be addressed by future research in such a way as to further refine and confirm our results. Firstly, we used cross-sectional data to test our research hypotheses. A longitudinal study would further our understanding by offering more information about precisely how TQM ascends through stages of diffusion. Secondly, the current study adopts three stages of post-adoption diffusion: acceptance, routinization and assimilation. Future research can employ longitudinal data to understand how acceptance leads to routinization and routinization leads to assimilation, as well as potentially other relationships amongst those three variables. Thirdly, we have not included incorporation as a construct as argued by Hazen et al. (2012) or not included employee involvement, empowerment and other soft dimensions of TQM. This is consistent with research extending the original diffusion model to include managerial innovations (Douglas et al., 2016), such as TQM. Fourthly, we collected data from a single informant from each firm. Most of the firms, especially medium or large scale, involve groups of senior managers who make decisions on strategic issues such as TQM adoption. Although most of the informants held senior positions, they were not all CEOs; thus, their individual perceptions of the organisation's TQM adoption might not accurately represent divergent opinions of others on the top management team. Therefore, we suggest that future research should develop ways to obtain differing perspectives across management. Finally, the demographic of our sample may limit the generalizability of our results. To eliminate the noise caused by industry differences, we purposely chose manufacturing companies. To avoid interference caused by varying professional backgrounds, we chose informants who had similar training. Although these choices may enhance the internal validity of our study, the external validity might not be as robust. Thus, as with any research findings, the results from our statistical analyses should be interpreted with caution when informing other contexts. Yet again, this provides another opportunity for future research to extend, confirm, or refute our findings.

### Appendix 1: Demographic Profiles

| Title                         | Number | %     |
|-------------------------------|--------|-------|
| CEO                           | 15     | 5.00  |
| COO                           | 40     | 13.33 |
| Finance Manager               | 15     | 5.00  |
| Quality Manager               | 115    | 38.33 |
| Human Resource Manager        | 15     | 5.00  |
| Procurement Manager           | 50     | 16.67 |
| Customer Relationship Manager | 35     | 11.67 |
| Sales Manager                 | 15     | 5.00  |

**Appendix 2: Loadings of Indicator Variables (Scale Composite Reliability and Average Variance Extracted)**

| Constructs | Measures | Factor Loading | Variance | Error | SCR  | AVE  |
|------------|----------|----------------|----------|-------|------|------|
| CP         | CP1      | 0.72           | 0.52     | 0.48  | 0.80 | 0.58 |
|            | CP2      | 0.65           | 0.43     | 0.57  |      |      |
|            | CP3      | 0.88           | 0.78     | 0.22  |      |      |
| NP         | NP1      | 0.52           | 0.27     | 0.73  | 0.76 | 0.52 |
|            | NP2      | 0.78           | 0.60     | 0.40  |      |      |
|            | NP3      | 0.83           | 0.68     | 0.32  |      |      |
| MP         | MP1      | 0.94           | 0.88     | 0.12  | 0.93 | 0.78 |
|            | MP2      | 0.89           | 0.79     | 0.21  |      |      |
|            | MP3      | 0.92           | 0.85     | 0.15  |      |      |
|            | MP4      | 0.78           | 0.61     | 0.39  |      |      |
| TMC        | TMC1     | 0.78           | 0.61     | 0.39  | 0.92 | 0.65 |
|            | TMC2     | 0.83           | 0.69     | 0.31  |      |      |
|            | TMC3     | 0.83           | 0.70     | 0.30  |      |      |
|            | TMC4     | 0.81           | 0.66     | 0.34  |      |      |
|            | TMC5     | 0.81           | 0.65     | 0.35  |      |      |
|            | TMC6     | 0.79           | 0.63     | 0.37  |      |      |
| ASM        | ASM1     | 0.75           | 0.56     | 0.44  | 0.77 | 0.53 |
|            | ASM2     | 0.61           | 0.37     | 0.63  |      |      |
|            | ASM3     | 0.81           | 0.65     | 0.35  |      |      |
| ACP        | ACP1     | 0.97           | 0.94     | 0.06  | 0.95 | 0.86 |
|            | ACP2     | 0.97           | 0.94     | 0.06  |      |      |
|            | ACP3     | 0.85           | 0.72     | 0.28  |      |      |
| RO         | RO1      | 0.63           | 0.39     | 0.61  | 0.76 | 0.78 |
|            | RO2      | 0.62           | 0.38     | 0.62  |      |      |
|            | RO4      | 0.72           | 0.52     | 0.48  |      |      |
|            | RO5      | 0.68           | 0.47     | 0.53  |      |      |

Note: CP = Coercive Pressure; NP = Normative Pressure; MP = Mimetic Pressure;

TMC = Top Management Commitment;

ACP = Acceptance; RO = Routinization; ASM = Assimilation

### Appendix 3: Correlations among major constructs

|     | CP    | NP    | MP    | TMC  | TQM-ASM | ACP  | RO   |
|-----|-------|-------|-------|------|---------|------|------|
| CP  | 0.76  |       |       |      |         |      |      |
| NP  | 0.53  | 0.72  |       |      |         |      |      |
| MP  | -0.02 | -0.10 | 0.88  |      |         |      |      |
| TMC | 0.11  | 0.45  | -0.12 | 0.81 |         |      |      |
| ASM | -0.14 | -0.01 | 0.35  | 0.08 | 0.73    |      |      |
| ACP | 0.14  | 0.28  | -0.12 | 0.13 | -0.06   | 0.93 |      |
| RO  | 0.05  | 0.13  | -0.15 | 0.11 | -0.05   | 0.33 | 0.88 |

*Note: The leading diagonal of the matrix represented in grey shade includes the square root of the average variance extracted. CP = Coercive Pressure; NP = Normative Pressure; MP = Mimetic Pressure; TMC = Top Management Commitment; ACP = Acceptance; RO = Routinization; ASM = Assimilation; OS = Organization Size*

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