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How knowledge sharing and business process contribute to organizational performance: using the fsQCA approach

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Abstract

The purpose of this research is to carry out a comparative analysis of organizational factors that facilitate knowledge sharing and business process, ultimately contributing to the improvement of organizational performance. The literature considers knowledge sharing a key factor for driving innovation as well as the organization's business performance, as both explicit and tacit knowledge sharing promotes a novel robust approach for business-knowledge process. This research explores the application of fuzzy-set qualitative comparative analysis as a set-theoretic comparative analysis approach to investigate the relationships between knowledge sharing, business process, and organizational performance through the identification of key organizational operation factors. Based on empirical data collected from 28 cases, the analysis results demonstrate the important role of organizational operation factors in knowledge sharing and business-knowledge process, which directly contribute to the improvement of organizational performance.

Keywords: Knowledge sharing, Business process, Organizational factor, Organizational performance, Fuzzy-set QCA.

1. Introduction

Facing rapid change in the knowledge economy, an organization with a vision of maintaining competitive advantages constantly updates knowledge assets (Blomqvist, Hurmelinna-Laukkanen, Nummela, & Saarenketo, 2008; Cooper, 2001). However, past studies show challenges of understanding and managing critical factors required for resolving complicated knowledge management (KM) issues. Some studies analyze performance measurement issues, and others KM in general (Davenport, De Long, & Beers, 1998), as well as the impact of KM on innovation (Alavi & Leidner 1999; Bouncken & Kraus 2013). However, the research rarely empirically addresses the associations of knowledge sharing, business processes, and organizational operation factors; hence, how knowledge sharing, business processes, and organizational operation factors underpin the continuous improvement of business performance for sustainable competitive advantage remains unclear.

According to Ragin (2000, 2008), fuzzy-set qualitative comparative analysis (fsQCA) is a set-theoretical approach specifically designed for case-oriented exploration of phenomena in social sciences, thereby demonstrating complex causality, such as characteristics of configurational equifinality and casual asymmetry for a small number of cases. The fsQCA finds missing associations of subset entities between independent and dependent conditions using traditional analysis techniques. In addition, the fsQCA provides a systematic approach for data calibration and quantification of qualitative fuzzy set data (fuzzy set membership assignment) (Fiss, 2007; Woodside, 2013).

This study attempts to identify the importance of organizational operation factors and to expand knowledge sharing research through comparative analysis of their relationships to business process and organizational performance. This study emphasizes the significance of inter-relationships of the components that support performance, and investigates the indirect impact of organizational operation factors on organizational performance based on prior studies. In Section 2, this paper reviews related literature. Sections 3 and 4 present the conceptual model and empirical findings, respectively. Section 5 provides a discussion. Section 6 concludes, and presents directions for future research.

2. Theoretical background

2.1 Business processes

Ackerman (1994) states that organizations invest greatly in business processes, which are a set of logical related activities performed to achieve the best outcome. Hence, constantly updating the philosophy behind the technicality of the whole business process is necessary. Traditional business performance and response mechanisms postulate step-by-step process as an essential part of business processes; in fact, organizations modulate or undervalue business-knowledge processes (Blomqvist et al., 2008). Business knowledge and experience characteristically reside only in individuals' minds, and thus, the transfer of knowledge and experience explicitly to business processes is very difficult. However, Mohamed, Mynors, Grantham, Walsh, and Chan (2006) argue that when employees change positions, move to new organizations, or retire, their knowledge certainly leaves with them, causing a permanent void in an organization (Bohn, 1994). Hence, organizational knowledge base exteriorizes the business process mechanism, which influences performance by retaining relevant knowledge and experience. Furthermore, the business processes build organizational memory for performance. The first phase of business-knowledge processes emphasizes retrieving and sustaining business knowledge (Chan & Chao, 2008; Cooper, 2001; Damanpour, 1991).

Such conditions as time-induction impel business-process models to adjust and develop consistently; hence, business processes must adjust compliantly and swiftly to variations in the competitive environment (Nonaka, Toyama, & Konno, 2000; Alkhuraiji, Liu, Oderanti, & Megicks, 2015). For this reason, organizations have to develop mechanisms to identify glitches in business processes. Organizational memory generating new knowledge through knowledge production operation and categorization then flows into the organizational activities, further providing solutions for business-process problems (Krogh, Nonaka, & Aben, 2001).

2.2 Organizational operation factors

Organizational operation factors, which support successful business-processes and knowledge-sharing integration, are the key interest in previous research-based approaches (Crossan, Lane, & White, 1999). The integration of business processes and knowledge sharing is a complex process and includes operation factors that can potentially influence successful integration of business-knowledge processes. In addition, these factors can have a positive impact on business-processes and knowledge-sharing integration project outcomes, whereas the lack of these factors can create challenges during or after business-processes and knowledge-sharing integration. The literature provides different options regarding what factors are important for the successful integration of business-processes and knowledge-sharing integration, or are accountable for failure (Chan & Chau, 2005). Diverse perspectives exist on the critical success factors for business-processes and knowledge-sharing integration (Bohn, 1994). Many researchers, such as Crossan et al. (1999), consider that the range of factors that can be critical to the success of business processes and knowledge-sharing system integration aims to discover critical success factors, including top management support and education on new business processes. Damanpour (1991) postulates critical organizational factors, such as business-process selection, organizational structure, training, cultural and structural management. Darroch and McNaughton (2002) argue that when considering factors for business-processes and knowledge-sharing integration, top priorities must include commitment by top executives, understanding of strategic goals, knowledgeable integration teams, organizational commitment to change, performance measures, and employees' welfare.

According to Oyemomi, Liu, and Neaga (2015), for organizational factors to be instrumental in determining the success of business-processes and knowledge-sharing integration, clear understanding of performance objectives is necessary. Therefore, this research focuses on three aspects of organizational factors, that is, leadership support, learning and training, and communication. Darroch and McNaughton (2002) discuss the importance of these factors.

2.2.1 Leadership support

Previous research highlights leadership support as a major factor for successful business-process and knowledge-sharing integration (Chan & Chao, 2008; Cooper, 2001; Damanpour, 1991). According to Darroch (2003, 2005), leadership support has a significant role in business-process and knowledge-sharing implementation, considering the fact that implementation is large-scale and requires extensive resources. Damanpour (1991) recommends that leadership support start at the initiation and facilitation stage; therefore, continuous support for business-process and knowledge-sharing integration becomes the new challenge. Aspects of business-process and knowledge-sharing implementation require the participation of top management providing the necessary resources and leadership. The responsibilities of top management in business-process and knowledge-sharing integration include effective collaboration of the organization's strategy by relevant departments within the organization, establishing an understanding of abilities and limitations, and promoting performance objectives for business-process and knowledge-sharing integration.

2.2.2 Learning and training

The implementation and sustainability of business-process and knowledge-sharing integration is a complex procedure, and thus, adequate continuous learning enables employees to understand and improve their roles in making the system more effective and efficient (Chan & Chao, 2008; Cooper, 2001; Damanpour, 1991; Darroch, 2003). Furthermore, enhancing employees' level of knowledge and ability with training programs would lead to constant improvement in individual performance and consequently, organizational performance. Darroch and McNaughton (2002) state that continuous learning could increase the probability success rate of business-process and knowledge-sharing integration; and thus, establishing a learning environment in organization structure would assist in building a robust workplace. In addition, a learning environment would aid employees to adjust to the organizational changes taking place with the integration of the business knowledge system. Training programs reduce the risk of employees' resistance to the new system. Implementing a business-process system without an enabled learning environment could have drastic consequences.

2.2.3 Communication

Effective communication supports new business processes for the organization, minimizing the risk of employees' resistance (Damanpour, 1991). Effective communication is vital from the starting point to the implementation and sustaining stage of knowledge-incorporated business process (Chan & Chao, 2008; Cooper, 2001; Damanpour, 1991). Darroch and McNaughton (2002) state that both internal communication among organizational structural hierarchy and outward communication to the entire organization are critical for achieving sustainability.

The set up and practice of effective communication plans that do not compromise the aims of implementing the new business system (Darroch, 2003, 2005) are possible when managers involve themselves in the activities of business-process and knowledge-sharing implementation and sustainability.

2.3 Explicit and tacit knowledge sharing

Knowledge sharing is a continuous, interactive process that facilitates the transfer of employees' tacit knowledge to business processes through effective communication by using a channel for acquiring new experience in the knowledge context, a new view of a process, and knowledge discovery. Thus, knowledge sharing is a journey from having to sharing (Cui, Griffith, & Cavusgil, 2005). Knowledge sharing between employees exceeds the boundaries between self and other, as collaboration among employees and between employees and business processes generate knowledge.

To understand how organizations dynamically share knowledge, this study proposes a knowledge-sharing model based on three theories:

(1) the socialization, externalization, combination, and internalization (SECI) model, which is the process of knowledge sharing through conversion of

employees’ tacit and business processes into explicit knowledge (Krogh et al., 2001);

(2) Japanese Ba, the shared context for knowledge sharing (Nonaka et al., 2000); and

(3) knowledge assets, which are the inputs, outputs, and moderators of knowledge sharing for business processes (Oyemomi et al., 2015).

The three foundations of knowledge sharing have to interact with each other to transform the knowledge curve that promotes business processes. Variance in the objective value of knowledge exists and as such, previous studies recommend placing a subjective value on knowledge when considering implementing knowledge sharing (Ribeiro & Huarng, 2013; Bouncken, Plüschke, Pesch, & Kraus, 2014). This placement generates changes in the perceived assessment of knowledge, allowing employees’ preferences to execute business processes based on knowledge use. Thus, the employees’ preferences for factual knowledge are important, as this knowledge is explicit, and processes and interactions must be explained unambiguously to enhance understanding. As employees discover more, knowledge preference ideally changes. Furthermore, this newly discovered knowledge indirectly transforms into tacit knowledge (Liu, Moizer, Megicks, Kasturiratne, & Jayawickrama, 2014).

2.4 Organizational performance

Different philosophies about organizational performance (Cook, Liang, & Zhu, 2010; Damanpour, 1991) exist as follows. The ability of an organization to achieve set objectives of retaining profit, competitive edge, increasing market share, and maintaining long-term survival depend on using applicable organizational strategy and action plans. This study considers organizational performance as a measurement of productivity by considering the knowledge contributions of an organization’s employees. Many studies discuss the search for organizational peak performance (Chan & Chao, 2008; Cooper, 2001; Damanpour, 1991; Ribeiro, 2010) as the ultimate goal of the organization. Therefore, organizations covering different domains constantly compete to improve their performances by developing an edge that differentiates each organization from competitors.

Organizations employ internal measuring criteria, that is, key performance indicators, as performance measurement units. Organizational investment in performance measurement systems is very important for performance evaluation that directly influences the manner of assessing the level of achievement of performance objectives and review of strategic plans. Researchers mostly evaluate organizational performance using broad categories, known as performance elements, which is a system that receives inputs and adds value. These elements are effectiveness, efficiency, quality, profitability, quality of innovation, and productivity (Huarng, 2011). High-performing organizations actively and regularly assess their performance and measure their progress against established target values using these elements. These elements provide a mechanism for organizations to assess their financial and nonfinancial performances. High-performing organizations not only aim to sustain a predefined level of performance, but also constantly strive to optimize organizational performance by improving performance elements.

3. Conceptual model

Based on the theoretical foundation discussed in Section 2, this section proposes a conceptual framework to establish the relationships between knowledge sharing, (including both explicit and tacit knowledge sharing), business process, and organizational performance by considering key organizational operation factors.

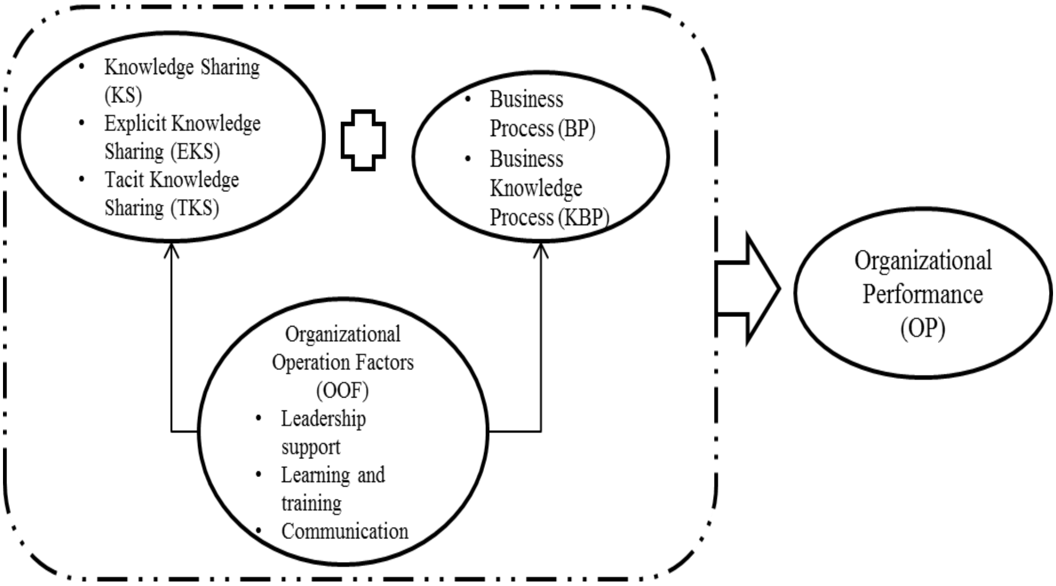

Figure 1 The Conceptual Framework

Exploring knowledge assets is a way of transforming business processes through unique organization-specific strategies. In addition, exploring knowledge assets is a strategy for an organization to increase organizational memory by creating new business processes with both organizational and employee knowledge (Haslam & Ellemers, 2005). For example, a multinational manufacturing organization uses employee rotation to stimulate the creation of new knowledge and to facilitate the development of new business processes by applying individual know-how to tackle barriers in performance. Business-knowledge processes are continuous organizational activities, and thereby generate new knowledge during the following interactions: individual-to-individual, individual to group, group to individual, individual to business processes, and group to business processes (Greve, 2003). Organizations have explicit knowledge existing in the form of procedures, business activities, and documented instructions, and employees can use knowledge in this form on a daily basis to complete business processes within a given timeframe. Continual repetition by employees of these sets of activities generates new knowledge; however, this new knowledge resides with the employees and sometimes is difficult to document or transfer.

This study takes a critical view on three organizational operation factors: leadership support, learning and training, and communication. Of note, leadership or leaders are successful only in as much as their decisions are impactful and accepted by every employee of the organization. Due to the high demand for sustaining competitive advantage, leadership usually focuses on decision making (Hannan & Freeman, 1984). For leadership to support effective business-knowledge processes in the organization, leadership must pay attention to building relationships with employees through the identification of employees' knowledge needs and motivations, thereby deploying and allocating the required support and resources (Chemers, 2002). This situation illustrates that for successful business-process implementation, leadership competence to motivate and inspire employees to contribute individual tacit knowledge to organizational memory is exemplary. Therefore, leadership support by getting involved in learning and training activities demonstrates competence at the apex of the organization (McCallum & O'Connell, 2009).

The development of business-knowledge processes for improved organizational performance clearly depends on organizational operation factors building an integrative approach. In addition, these factors provide opportunities for organizations to evaluate the performance of business-knowledge processes periodically. Therefore, executive support for the integration of business-knowledge processes and sustainability is a prerequisite for successful implementation. In addition, the participation of executives invariably promotes good practice and dissemination of effective decision making at every level of the organizational structure.

4. Empirical findings

4.1 Data and calibration

This study uses fsQCA to demonstrate a holistic and comprehensive view of the antecedents and complex solutions of business-process and knowledge-sharing integration project outcomes (Meyer, Tsui, & Hinings, 1993; Schneider, Schulze-Bentrop, & Paunescu, 2010; Woodside, Hsu, & Marshall, 2011). This study considers the net impact of the organizational operation factors that are conditional antecedents on organizational performance induced by business-process and knowledge-sharing integration, as well as the level of performance of employees, in the context of interrelationship. The finding implies that the respective relationships between variables are generally asymmetric, and thus, alternative combinations of causal conditions can lead to the outcome condition (Benavides Espinosa & Merigó Lindahl, 2015). In light of this set of results, this research study highlights the role of organizational operation factors by using fsQCA to obtain a focused analysis based on set conditions, antecedents, and consequences. In fsQCA terminology, the aim is to examine the complex antecedent conditions that lead a complex solution to the four outcome conditions: (1) business processes, (2) explicit knowledge sharing, (3) tacit knowledge sharing, and (4) organizational operation factors. The significance of this study depends on the efforts to describe combinatorial complexities, assuming asymmetric relationships other than symmetrical net impact.

Table 1 includes the applicable data for 28 cases (i.e., respondents) in the dataset. Table 1 illustrates the original variables and the respective calibrated fuzzy sets. The first five columns of the dataset show:

- "bp" for business processes;
- "eks" for explicit knowledge sharing;
- "tks" for tacit knowledge sharing;
- "oof" for organizational factors; and
- "op" for organizational performance.

The last five columns starting with "f_" represent the respective calibrated fuzzy sets.

The consequential complex solutions demonstrate the alternative causal procedures that present high membership in each of the outcome conditions. This study focuses on the presentation of the complex solutions, contrary to the parsimonious and intermediate solutions; this solution makes no simplifying assumptions (Elliott, 2013; Woodside et al., 2011). Table 2 illustrates the means, standard deviations, and *N* cases of the variable that business-knowledge processes represent in this study. As the table shows, none of the variables has a missing case. Table 2 shows descriptive statistical results for the variables.

Table 1: Original data and calibrated fuzzy sets of the 28 cases

Case	bp	eks	tks	of	op	fbp	feks	ftks	foof	fop
1	3.56	2.3	3	3	3	0.7	0.3	0.5	0.5	0.5
2	4.89	4	5	4	5	0.94	0.82	0.95	0.82	0.95
3	3.56	3.75	1	2	1	0.7	0.75	0.08	0.23	0.08
4	4	3.5	4	4	3	0.82	0.68	0.82	0.82	0.5
5	4.45	4	2	3	4	0.9	0.82	0.23	0.5	0.82
6	5	4.25	4	4	4	0.95	0.87	0.82	0.82	0.82

7	2.99	5	4	5	5	0.5	0.95	0.82	0.95	0.95
8	4.12	4	3	4	3	0.84	0.82	0.5	0.82	0.5
9	3.76	2	2	3	3	0.76	0.23	0.23	0.5	0.5
10	4.88	3	4	4	3	0.94	0.5	0.82	0.82	0.5
11	3.99	3	3	3	3	0.82	0.5	0.5	0.5	0.5
12	3.55	5	3	4	4	0.7	0.95	0.5	0.82	0.82
13	5	0.5	4	4	4	0.95	0.05	0.82	0.82	0.82
14	3.66	1.5	3	3	3	0.73	0.14	0.5	0.5	0.5
15	3.66	4.34	3	4	4	0.73	0.88	0.5	0.82	0.82
16	4.11	5	4.23	4	3	0.84	0.95	0.86	0.82	0.5
17	4.33	3	3	3	4	0.88	0.5	0.5	0.5	0.82
18	2.55	4	2	3	3	0.37	0.82	0.23	0.5	0.5
19	4	1.76	3	3	2	0.82	0.18	0.5	0.5	0.23
20	2.44	2.77	3	4	4	0.34	0.43	0.5	0.82	0.82
21	3.77	3	3	4	4	0.76	0.5	0.5	0.82	0.82
22	4	3	2.34	4	3	0.82	0.5	0.31	0.82	0.5
23	5	4	3	4	4	0.95	0.82	0.5	0.82	0.82
24	5	4	3	4	5	0.95	0.82	0.5	0.82	0.95
25	3.88	3	3	4	4	0.79	0.5	0.5	0.82	0.82
26	5	2.88	4	4	4	0.95	0.46	0.82	0.82	0.82
27	3.99	4	4	4	4	0.82	0.82	0.82	0.82	0.82
28	3.22	5	3	4	4	0.58	0.95	0.5	0.82	0.82

Table 2: Descriptive statistical analysis of the variables

Variable	Mean	Std. Dev.	Minimum	Maximum	N Cases	Missing

fbp	0.78	0.16	0.34	0.95	28	0
feks	0.62	0.26	0.05	0.95	28	0
ftks	0.55	0.22	0.08	0.95	28	0
foof	0.71	0.17	0.23	0.95	28	0
fop	0.67	0.22	0.08	0.95	28	0

4.2. Complex causal statements for organizational performance outcome

The model examines the complex antecedent conditions with relationship membership scores in the outcome condition of organizational performance by combination of business processes, knowledge sharing, and the corresponding negated value of organizational factors. Hence, this study measures consistency scores for all possible complex causal combinations for the outcome conditions and applies a cutoff consistency score value of 0.80. The result shows the combinations with consistency scores higher than this threshold. Table 3 shows that all solutions are informative, and therefore, the consistency values are higher than 0.74 and all coverage values range between 0.25 and 0.90, as previous studies suggest (Ragin, 2008; Woodside & Zhang, 2013). The first pathway indicates that high contribution of knowledge-sharing activities, with innovative business processes and consideration of key organizational factors, results in high performance of business activities for informed organizational decision making (consistency = 0.88; coverage = 0.75). The second pathway indicates the combination model from the complex solution, as shown in Table 3, (frequency cutoff = 1.00; consistency cutoff = 0.90). Low corresponding negated value of organizational factors in combination with other antecedent conditions produces coverage.

Table 3: Complex solution for the outcome coverage and consistency

Complex solution	Raw coverage	Unique coverage	Consistency
fbp*ftks*foof	0.730606	0.444740	0.917890
fbp*feks*~ftks*~foof	0.307651	0.021785	0.903276
Solution coverage: 0.752391			
Solution consistency: 0.884447			
Frequency cutoff: 1.000000			
Consistency cutoff: 0.903276			
fbp	0.914453	0.424017	0.787643
feks*~ftks	0.502126	0.011690	0.909528
Solution coverage: 0.926142			
Solution consistency: 0.778472			
Frequency cutoff: 1.000000			
Consistency cutoff: 0.908497			
foof*~feks	0.465994	0.104144	0.954298
feks*fbp	0.748140	0.386291	0.903143
Solution coverage: 0.852285			
Solution consistency: 0.900112			
Frequency cutoff: 1.000000			
Consistency cutoff: 0.905775			

A complex antecedent condition shows the relationship of high knowledge-sharing activities to organizational factors that can influence the implementation of business-knowledge processes (Fiss, 2007, 2011; Woodside & Zhang, 2013). Similarly, organizational factors appear in combination with antecedent conditions of the derived pathways. However, high impact of organizational factors appears to determine one of the derived pathways, suggesting that presence is a major condition for high organizational performance during business-process implementation and sustainability.

5. Discussion

This study examines how organizational factors influence the implementation of business-knowledge process for improved organizational performance. In addition, this study elaborates on the outcomes of implementing business-knowledge processes by analyzing the impact of organizational factors on integrating knowledge-sharing activities with business processes, such as leadership support, communication, and learning and training.

This study empirically tests the contribution of knowledge sharing and business process on organizational performance. The concept of business-knowledge processes is relatively new to organizational activities for improving organizational performance; business executives are interested in improving performance by giving more attention to transforming business processes into business-knowledge processes. However, previous research studies the relationship between business process and knowledge sharing (Liu et al., 2014; Ribeiro & Huarng, 2013), but rarely does knowledge sharing improve business process directly. Therefore, previous research neglects organizational factors as a catalyst that enhances sustainability of organizational performance and knowledge-sharing integration (Ribeiro, 2010). This study is the first investigation of these connections in an integrated manner, thereby contributing to a more realistic business-process context compared to other studies on the relationships between business process and knowledge sharing (Cui et al., 2005). In summary, this study establishes the relationship between business processes and knowledge sharing through a new process (business-knowledge process) for a knowledge-driven working environment to improve organizational performance.

Finally, the integration of business process with knowledge sharing occurs by considering organizational operation factors as an important factor for successful implementation, which supports earlier findings (Cook et al., 2010). This finding shows the role of organizational operation factors in shaping business-process and knowledge-sharing integration. The outcome confirms that organizational operation factors directly impact business process and knowledge sharing definitely improves organizational performance (Darroch & McNaughton, 2002). This result is reasonable, as knowledge sharing supports a collaborating process in which organizations generate organizational memory through interaction between knowledge workers and business process. Furthermore, because knowledge sharing enhances the organization’s ability to gain a competitive edge against rivals with integrated business-knowledge processes that empower organizational memory (Huarng, 2011), how organizational memory develops for business-knowledge process depends significantly on the management of organizational operation factors. Furthermore, organizations with high organizational memory capacity have the momentum to exchange more knowledge as a catalyst for business-knowledge processes by implementing integrated knowledge-sharing activities by which employees can improve their performance levels, which may in turn enhance overall organizational performance. This result is as knowledge sharing and organizational factors are major drivers for organizational performance (Oyemomi et al., 2015). The aforementioned actions could reinforce competitive edge. This study recommends that knowledge sharing with business process support the improved organizational performance necessary for competitive advantage among rivals by initiating and considering organizational operation factors. Improved performance is possible by building a fundamental organizational memory, to capture know-how that will influence positively on employees and performance. This is in-line with Liu et al.'s (2014) argument that know-how acts as an important component for building organizational memory to improve organizational performance by business-process and knowledge-sharing implementation. This study considers organizational operation factors as key catalysts to achieve organizational goals, implement business-knowledge processes, and sustain organizational performance.

6. Conclusions

This analysis shows that the significant contribution of knowledge sharing in any organization could improve performance. fsQCA provides an innovative analytic technique to compare and contrast the impact of organizational factors on the implementation and continuous practice of an integrated business-knowledge process. The results provide possibilities for enhanced performance when an enabled environment exists for generating new knowledge. The use of fsQCA in this research offers new understanding of the contribution of knowledge sharing to organizational performance.

This study has some limitations. First, the proposed business-knowledge processes considered only three factors; therefore, other factors, such as culture, might support the explanation of antecedent conditions for complex solutions. Business-knowledge processes for organizational performance fail to consider culture as one of the critical factors. However, various regulations govern organizations in different countries. Future work should consider including other organizational operation factors by identifying specific characteristics of organizations based on country of operation; for example, factors associated with organizations in China might not apply to organizations in the United States. Third, this study focuses mainly on a truth table complex solution, considering organizational factors as an indirect variable for the organizational performance outcome; however, multiple indirect variables yield more solutions, which provide more analytical results for future work to improve the validity of the results.

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