The Mediating Effect of IT Capability on the Relationship between Knowledge Management Processes and Organization Performance in Jordanian ICT Companies: A Conceptual Framework

Wasef Ibrahim Almajali, Khairol Anuar Ishak, Siti Noratisah Mohd Nafi
School of Business Management, Universiti Utara Malaysia, Malaysia

Abstract. Nowadays, organizations in all business aspects are coming to view knowledge management as one of the most valuable and strategic assets and looking for new ways to improve their performance through multiple strategies such as IT capability and knowledge management processes which should be already embedded in organization. The purpose of this study is to explore the relationship between knowledge management processes, IT capability and organizational performance in the context of information and communication technology sector (ICT). More specifically, it develops a new conceptual framework about the mediating effect of IT capability on the relationship between knowledge management processes and organizational performance. This model would help decision-makers, practitioners and managers involved in ICT sector enhance their perceptions of knowledge management process and consider the significant role of knowledge management process and IT capability in improving organizational performance. Further, the scope for future study is to test and validate the proposed model by collecting the primary data from ICT companies.

Keywords: knowledge management process, IT capability

Introduction

ICT sectors are considered as one of the fastest developing and growing organizations and the most significant sectors in the business scope (Teki, Özkale & Ayhan, 2018). This sector operates under constant pressures. So, they are continuously seeking to develop their strategies and capabilities to improve organization performance (Mustafa & Badarin, 2016). Buddecomm (2018), argued that upon the competitiveness of the ICT sector in the Middle East, and instability in the Middle East, Jordan has become a centre for ICT companies. It is worth noting that telecommunication companies need to improve their performance in order to support the progress of national economy (Valinejad & Rahmani, 2018; Ahmadi, Petrudi, & Wang, 2017).

According to RACKNAP report (2019), inefficient information technology (IT) systems and strategies have been the most important challenges for the telecommunication sectors to deal with in order to reach target customers. So, ICT companies should adapt their organization to a certain level of ICT innovation to maintain organizational flexibility and meet customer expectations. In order to gain competitive advantage and improve their performance, telecommunication sectors in Jordan should enhance their technological capabilities and invest more in information technology (Hajir et al., 2015). Subsequently, IT as a significant factor must be used in business procedures and techniques (Ghobakhloo et al., 2012). More specifically, combining Information Technology capability (IT capability) with other organization strategies is a prerequisite for better performance and sustainable competitive advantage (Liang, You, & Liu, 2010; Homaid, Minai, & Rahman, 2015).

Among the most well-known organizational strategies, it has been confirmed that knowledge management (KM) has a competitive advantage for telecommunication organizations in Jordan (Qasrawi, Almahamid, & Qasrawi, 2017; Hajir et al., 2015). Moreover, KM processes positively affects the overall progress of industry and addresses the requirements of organizations in certain areas (Mashal, 2018). So, if ICT companies need to improve their creative power, they should work to keep KM processes.

However, despite interest shown by business and academic domains, there is a lack of comprehensive research on knowledge management (Akroush & Al-mohammad, 2010). Moreover, there is a need for empirical evidence which is explicit and unequivocal regarding the influence of knowledge management on innovation technology and its performance. Therefore, further understanding of knowledge management implementation and its relationship with IT capability and Organizational Performance (OP), in particular, in Jordanian telecommunication and information technology organizations is required (Alrubaiee, Alzubi, & Hanandeh, 2015). This study adopts KM processes and IT capability to find out the catalysts of OP for ICT companies in Jordan.

Literature Review

Organizational Performance (OP)

OP represents an essential part of organization management. Also, organizational performance indicates a central position regarding the field of organizational research (Lewin & Minton, 1986). According to Dess and Robinson (1984), many researchers have measured organizational performance through either objective or subjective data (as cited in Croteau & Bergeron, 2001). Croteau and Bergeron (2001) confirmed that an objective approach refers to financial performance while a subjective method addresses perception of respondents. There are other methods of performance measurement offered in the previous literature. Sabella, Kashou, and Omran (2014), indicated several elements for measuring performance including quality performance, business customer satisfaction, operational performance, organizational growth, and employee satisfaction. In addition, financial performance, innovation performance, market, and social responsibility are elements of organization performance measurement (Sadikoglu & Olcay, 2014). Neely (1999) indicated that organizational performance is a critical measurement in evaluating the failure or success of an organization. According to Moullin (2007), organization performance measures an organization's value and management delivered to its customers and stakeholders. Organizational performance is the measurement method in assessing company accomplishment and ~~it~~ delivers and creates the organization's value to the internal and external customers. Therefore, it is significant for the organizations to measure their current performance situation in order to improve their organization performance in the future (Antony & Bhattacharyya, 2010).

This study focuses on the organizational performance in the services sector. Therefore, both performance measures; financial and non-financial, will be included to measure the organizational performance which were adopted from Sadikoglu and Olcay (2014). Sadikoglu and Olcay (2014), in their study has used multiple performance factors, that are operational performance, employee performance, innovation performance, customer results, social responsibility and market and financial performance in order to cover all element of organization performance.

Knowledge Management Process

According to Yang (2011), KM processes consist of creating, sharing, and applying knowledge in order to gain market opportunity and improve organizational performance. However, Chawla and Joshi (2012) found that definition of the concept of KM processes differs from one organization to another. For example, manufacturing firms may focus on processing the available knowledge, while service firms may concentrate on acquiring knowledge from customers. KM processes can be described in terms of a KM cycle which begins with locating the source of knowledge, and then transferring it into an explicit form by codification and sharing it throughout the organization (Dalkir, 2013). In the same vein, Meihami and Meihami (2014) argued that KM is an effective tool for improving efficiency and innovation in the firm.

It consists of creating, coding, sharing, and applying knowledge leading to the effective use of organizational resources. Ranjbarfard, Aghdasi, and López-Sáez (2014), studied barriers that limit KM effectiveness and found that poor support from top management and poor leadership negatively affect KM. Further, they concluded that managers can play a significant part in providing a supportive KM environment by enhancing coordination, promoting employee motivation, and facilitating the relationship with partners. Wong (2013), divided KM into knowledge acquisition and knowledge absorption. While the former relates to acquiring new knowledge from various sources, the latter is about converting explicit knowledge gained from the acquisition process into tacit knowledge (Uit Beijerse, 1999). It is believed that while knowledge creation is related to the process of new idea generation (Morey, 2001), knowledge application is associated with embedding the newly developed knowledge in implementing business processes and making it available to every individual in the firm (Shannak, 2009).

IT Capability

According to Bharadwaj (2000), IT capability refers to firms' capacity to utilize, apply, and deploy IT resources in collection or present with other resources and capabilities. Tippins and Sohi (2003) stressed that the concept of IT capacity which firm utilizes refers to all IT elements in managing information. In addition, they viewed IT capabilities as the extent to which a firm is equipped with IT objects, IT knowledge and IT operations. Ray, Muhanna, and Barney (2005) believe that IT capability consists of two types of resources: technological resources including raw IT investment, IT skills, and generic information technologies within the organization and managerial resources that influence the way technological resources are used.

A variety of IT-related variables were addressed by researchers and practitioners. For example, Li, Chen, and Huang (2006) and Tippins and Sohi (2003) classified IT capability into three dimensions: IT knowledge, IT operations and IT objects. A highly skilled project team should be much better equipped to manage the project of knowledge management.

IT knowledge is one of the most important components in organizations. Bhatt and Grover (2005) point out that IT knowledge is needed for organizations for three reasons. First, it enhances a holistic understanding of knowledge needed within the business units. Second, it acts as a facilitator to identify knowledge resources that are applicable across multiple units and finally, it motivates business units to invest not only in their own IT objects but also in boundary-spanning IT initiatives that are essential for acquiring and sharing knowledge processes. According to Pérez-López and Alegre (2012), this ability utilizes and develops new information and adopts innovations in daily routines to enhance profit and performance (Shao et al., 2009).

IT operations is considered as one of the core elements of IT capability that helps managers to manage organizations effectively, maintain client data properly and efficiently across business units (Pérez-López & Alegre, 2012). IT objects, also known as infrastructure, are the main elements of IT to improve the strategic organization (Lim & Trimi, 2014). According to Tippins and Sohi (2003), IT objects can be defined as a computer device having hardware, software and human capability used in this study (Melville, Kraemer, & Gurbaxani, 2016; Karim, Somers, & Bhattacherjee, 2007). IT object refers to hardware and software used inside the organization (Hasan, 2010; Pérez-López & Alegre, 2012).

Relationship and Hypotheses Development

This paper seeks to develop a new conceptual framework about the mediating effect of IT capability on the relationship between Knowledge Management Processes (as multidimensional construct) and Organizational Performance in the Jordanian ICT companies.

KM Processes and IT Capability

Knowledge management is an approach which is essential for enhancing firm capabilities, improving decision-making skills and developing strategy (Ooi, 2009; Glines-Kotecki, 2011). Regardless of the points of KM in making, supporting, and improving innovation, there is an absence of experimental research about the connection between KM processes and IT (Brachos et al., 2007; Jiang & Li, 2009; Sáenz, Aramburu, & Rivera, 2009). In addition, there is a gap in the literature about the role of KM processes in the capacity of the venture to develop ability effectively (Esterhuizen, Schutte, & Toit, 2011). Huang, Chen, Tsai, and Lee (2011), expressed that exploration models coordinating KM and data innovation systems for observational testing of these speculations have been rare. Along these lines, the present research aims to explore the connection between KM processes and IT ability in parts of the telecommunication organizations in Jordan. Ling and Nasurdin (2010), contended that the most ideal approach to improve IT capability (procedure and product innovation) is to ceaselessly upgrade the adequacy of the KM processes (acquisition, sharing, and application). In any case, the research results show that solitary knowledge acquisition was found to have a huge constructive role in the product innovation. Huang and Li (2009), demonstrated that the KM procedure has a huge and positive impact on firms with managerial and technological innovation. Based on the above argument, the following hypothesis is proposed:

Hypothesis (H1): KM processes have a significantly positive effect on the IT capability.

IT Capability and OP

The role of IT is undeniably important and its capability was considered as a key element in an organization to foster performance (Pebrianto & Kertahadi, 2013; Liu et al., 2013). Moreover, IT capability construct was related to the firm performance through increasing efficiency, decreasing long term cost, evolving service reliability and decreasing transaction errors (Tippins & Sohi, 2003). According to Lin (2007), IT capability increases firm's ability to monitor the environment, improves information quality for decision making and creates the superior path to earn profit. In addition, IT capability plays a pivotal role in almost all aspects of firm's operations and corporates strategies for many organizations.

According to Chi and Sun (2015), IT resources cannot provide organizations with sustainable competitive advantage by itself, and IT capability (the ability to integrate and deploy IT resources) is one of the crucial factors to help organizations obtain a long-term competitive advantage. Pérez-López and Alegre (2012), concluded that direct relationship does not exist between IT capability and OP. Contrary to the finding of this research, the relationship between knowledge sharing and organizational performance was examined in other studies and the findings of the researches showed that IT capability has a significant impact on organization performance (Liu et al., 2013; Thouin, Hoffman & Ford, 2008). Based on the above argument, the following hypothesis is proposed:

Hypothesis (H2): IT capability has a significantly positive effect on the OP.

KM Process and OP

The relationship between KM processes and organizational performance is well established in the literature. For example, a positive relationship was found between KM processes (acquisition, transformation, and application) and organizational performance by researchers (Liao & Wu, 2009; Al-Sa'di, Abdallah, & Dahiyat, 2017). Further, they proposed that there is a full mediating effect of learning between KM processes and performance. According to them, KM is an essential instrument for organizations to capture and transfer information in order to gain competitive advantage. Kim, Bennett, and Song (2012), examined

the relationship between knowledge sharing and organizational performance. The finding of their study showed that hospital structure has a significant impact on knowledge-sharing practices, both of which improve organizational performance in terms of patient safety. Similarly, Wang (2012), uncovered the relationship between tacit and explicit knowledge sharing and organizational performance. Their results indicated that both types of knowledge-sharing practices have a significant direct effect on organization performance. In service organizations, Birasnav (2014), delved into the relationship between leadership, KM, and performance. His results revealed that transformational leadership significantly affects KM processes and organizational performance when transactional leadership is kept on hold. Furthermore, he predicted that KM can play a partial mediating role in the relationship between transformational leadership and organizational performance. Finally, he suggested that KM processes have a positive impact on organizational performance. Based on the above argument, the following hypothesis is proposed:

H3: KM processes (acquisition, sharing, and application) have a significantly positive effect on the OP.

Although the earlier studies mentioned above showed that both KM processes and IT capability can influence organizational performance directly, the assumptions of these earlier studies are believed to be inaccurate for the following reasons. First, these studies help us to understand the best KM processes and IT capability, but they do not show how KM processes interact with IT capability to achieve superior organizational performance. Second, organizational performance is a broad concept and general measures can be affected by many internal and external factors other than KM processes and IT capability. The present study extends that literature by testing whether IT capability mediates the relationship between KM processes and organizational performance. Based on the above argument, the following hypothesis is proposed:

H4: IT capability has a mediating effect on the relationship between KM and OP.

Conceptual Framework

The conceptual model demonstrates the direct relationship between KM processes (acquisition, sharing, and application) and OP. Also, the mediating effect of IT capability on the relationship between KM Processes and OP in JTC is presented (See Figure 1).

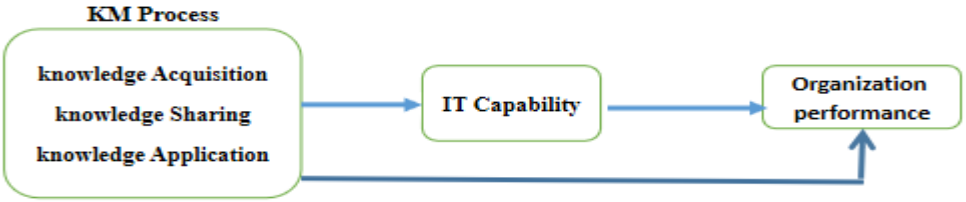

Figure 1. Conceptual framework showing the relationship

Conclusion

This study hypothesized the relationship between KM processes (acquisition, sharing, and application) and OP in a model in which knowledge acquisition, knowledge sharing, and knowledge application are independent variables, and organization performance is a dependent variable. Also, the mediating effect of IT capability on the relationship between KM Processes and OP was investigated. Regard the ICT sector; this study contributes to the current existing

literature by responding to the call for more research works on the relationship between KM and organizational performance, as the link is still not established. Thus, this study adds to narrow the gap in the literature related to this relationship. The findings of the study provide insights into how ICT companies managers and practitioners can enhance the performance of ICT companies and gain a competitive advantage in the market. This can be obtained through conducting KM activities effectively and building IT capability. The ICT companies' managers should pay attention to organization resources such as KM with IT capability as an organizational capability in order to ensure long-term success and gain superior performance.

References

Ahmadi, B., Petrudi, H., & Wang, X. (2017). Integrating sustainability into supplier selection with analytical hierarchy process and improved grey relational analysis: a case of telecom industry. *International Journal of Advanced Manufacturing Technology*, *90*(9–12), 2413–2427. https://doi.org/10.1007/s00170-016-9518-z

Akroush, M. N., & Al-mohammad, S. M. (2010). The effect of marketing knowledge management on organizational performance: An empirical investigation of the telecommunications organizations in Jordan. *International Journal of Emerging Markets*, *5*(1), 38–77. https://doi.org/10.1108/17468801011018266

Alizar Hasan. (2010). Assessing the Impact of IT Competency on Organizational Learning Capability of Indonesian Manufacturing Firms. *Jurnal Teknik Industri*, *12*(2), 81–88. http://puslit2.petra.ac.id/ejournal/index.php/ind/article/view/18063

Alrubaiee, L., Alzubi, H., & Hanandeh, R. (2015). Investigating the Relationship Between Knowledge Management Processes and Organizational Performance The Mediating Effect of Organizational Innovation. *International Review of Management and Business Research*, *4*(4), 989–1009.

Antony, J. P., & Bhattacharyya, S. (2010). Measuring organizational performance and organizational excellence of SMEs - Part 2: An empirical study on SMEs in India. *Measuring Business Excellence*, *14*(3), 42–52. https://doi.org/10.1108/13683041011074209

Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: an empirical investigation. *MIS Quarterly*, *24*(1), 169–196. https://doi.org/10.1007/s10869-016-9441-1

Bhatt, G. D., & Grover, V. (2005). Technology Types of Information Capabilities and Their Role in Advantage: Competitive An Empirical Study. *Journal of Management Information Systems*, *22*(2), 253–277. https://doi.org/10.1080/07421222.2005.11045844

Birasnav, M. (2014). Knowledge management and organizational performance in the service industry: The role of transformational leadership beyond the effects of transactional leadership. *Journal of Business Research*, *67*(8), 1622–1629.

Brachos, D., Kostopoulos, K., Soderquist, K. E., & Prastacos, G. (2007). *Knowledge effectiveness, social context and innovation*, *11*(5), 31–44. https://doi.org/10.1108/13673270710819780

Buddecomm. (2018). *Jordan - Telecoms, Mobile and Broadband - Statistics and Analyses*. https://www.budde.com.au/Research/Jordan-Telecoms-Mobile-and-Broadband-Statistics-and-Analyses

Chi, J., & Sun, L. (2015). IT and Competitive Advantage: A Study from Micro Perspective. *Modern Economy*, *6*(March), 404–410. https://doi.org/10.4236/me.2015.63038

Croteau, A.-M., & Bergeron, F. (2001). An information technology trilogy: Business strategy, technological deployment and organizational performance. *Journal of Strategic Information Systems*, *10*(2), 77–99. https://doi.org/10.1016/S0963-8687(01)00044-0

Esterhuizen, D., Schutte, C. S. L., & Toit, A. S. A. (2011). Knowledge creation processes as critical enablers for innovation. *International Journal of Information Management*, *32*(4), 354–364. https://doi.org/10.1016/j.ijinfomgt.2011.11.013

Ghobakhloo, M., Hong, T. S., Sabouri, M. S., & Zulkifli, N. (2012). Strategies for successful information technology adoption in small and medium-sized enterprises. *Information*, *3*(1), 36–67. https://doi.org/10.3390/info3010036

Glines-Kotecki, P. A. (2011). *Building organizational capability: A study of knowledge Management practices reasons, and Results* (Issue July). PhD. Dissertation, Capella University.

Hajir, J. A., Obeidat, B. Y., Al-dalahmeh, M., & Masa'deh, R. (2015). The Role of Knowledge Management Infrastructure in Enhancing Innovation at Mobile Telecommunication Companies in Jordan. *European Journal of Social Sciences*, *50*(3), 313–330.

Homaid, A. A., Minai, M. S., & Rahman, H. A. (2015). TQM and performance linkage in the microfinance institutions: The mediating role of IT capability. *Asian Social Science*, *11*(21), 213–230. https://doi.org/10.5539/ass.v11n21p213

Huang, H., Chen, Y., Tsai, M., & Lee, C. (2011). The Relationship between Knowledge Management Strategy and Information Technology Strategy. *International Journal of Economics and Management Engineering*, *5*(5), 515–519.

Huang, J.-W., & Li, Y.-H. (2009). The mediating effect of knowledge management on social interaction and innovation performance. *International Journal of Manpower*, *30*(3), 285–301.

Jiang, X., & Li, Y. (2009). An empirical investigation of knowledge management and innovative performance: The case of alliances. *Research Policy*, *38*(2), 358–368. https://doi.org/10.1016/j.respol.2008.11.002

Karim, J., Somers, T., & Bhattacherjee, A. (2007). The Impact of ERP Implementation on Business Process Outcomes: A Factor-Based Study. *Journal of Management Information Systems*, *24*(2), 221–260. https://doi.org/10.2753/MIS0742-1222240103

Kim, Y.-M., Newby-Bennett, D., & Song, H.-J. (2012). Knowledge sharing and institutionalism in the healthcare industry. *Journal of Knowledge Management*, *16*(3), 480–494.

Li, E. Y., Chen, J.-S., & Huang, Y.-H. (2006). A framework for investigating the impact of IT capability and organisational capability on firm performance in the late industrialising context. *International Journal of Technology Management*, *36*(1–3), 209–229. https://doi.org/10.1016/j.colsurfa.2005.09.045

Liang, T.-P., Kaohsiung, T., Kong, H., You, J.-J., & Liu, C.-C. (2010). A resource-based perspective on information technology and firm performance: A meta analysis. *Industrial Management and Data Systems*, *110*(8), 1138–1158. https://doi.org/10.1108/02635571011077807

Lim, S., & Trimi, S. (2014). Impact of Information Technology Infrastructure Flexibility on the Competitive Advantage of Small and Medium Sized-Enterprises. *Journal of Business & Management*, *3*(1), 1–12. https://doi.org/10.12735/jbm.v3i1p1

Lin, B. W. (2007). Information technology capability and value creation: Evidence from the US banking industry. *Technology in Society*, *29*(1), 93–106. https://doi.org/10.1016/j.techsoc.2006.10.003

Ling, C., & Nasurdin, A. M. (2010). Knowledge management effectiveness and technological innovation: An empirical study in the Malaysian manufacturing industry. *Journal of Mobile Technologies, Knowledge and Society*, *13*, 1–14. https://doi.org/10.5171/2010.428053

Liu, P., Zhao, R. Y., Wang, W. L., & Xiao, J. (2013). Information technology capability and firm performance: A meta-analysis. In *2013 10th International Conference on Service*

Systems and Service Managemen, 719–724. https://doi.org/10.1109/ICSSSM.2013.6602519

Mashal, A. (2018). The Impact of Deregulation and Privatization on Financial and Operation Performance of Telecommunication Sector in Arab Countries. *Journal of Economics*, *6*(4), 89–103. https://doi.org/10.15640/jeds.v6n4a8

Melville, N., Kraemer, K., & Gurbaxani, V. (2016). Information Technology and Organizational Performance : An Integrative Model of IT Business Value. *MIS Quarterly*, *28*(2), 283–322.

Moullin, M. (2007). Performance measurement definitions: Linking performance measurement and organisational excellence. *International Journal of Health Care Quality Assurance*, *20*(3), 181–183. https://doi.org/10.1108/09526860710743327

Mustafa, M., & Badarin, R. Al. (2016). The role of the training process in organizational change in the Jordanian telecom companies operating in Irbid Governorate. *IUG Journal of Economics and Business Studies*, *24*(3), 125–150.

Neely, A. (1999). The performance measurement revolution: why now and what next? *International Journal of Operations & Production Management*, *19*(2), 205–228. https://doi.org/10.1108/01443579910247437

Ooi, K. (2009). TQM and knowledge management: Literature review and proposed framework. *African Journal of Business Management*, *3*(11), 633–643. https://doi.org/10.5897/AJBM09.196

Pebrianto, A., & Kertahadi, S. (2013). The Influence of Information Technology Capability, Organizational Learning, and Knowledge Management Capability on Organizational Performance (A Study of Banking Branches Company in Southern Kalimantan Province). *Information and Knowledge Management*, *3*(11), 112–121.

Pérez-López, S., & Alegre, J. (2012). Information technology competency, knowledge processes and firm performance. *Industrial Management and Data Systems*, *112*(4), 644–662. https://doi.org/10.1108/02635571211225521

Qasrawi, B. T., Almahamid, S., & Qasrawi, S. T. (2017). The impact of TQM practices and KM processes on organisational performance. *International Journal of Quality & Reliability Management*, *34*(7), 1034–1055. https://doi.org/http://dx.doi.org/10.1108/MRR-09-2015-0216

RACKNAP. (2019). *Top 5 challenges and trends in the telecommunication industry in 2019*. https://www.racknap.com/blog/top-5-challenges-trends-telecommunication-industry/

Ranjbarfard, M., Aghdasi, M., López-Sáez, P., & López, J. E. N. (2014). The barriers of knowledge generation, storage, distribution and application that impede learning in gas and petroleum companies. *Journal of Knowledge Management*, *18*(3), 494-522. https://doi.org/10.1108/JKM-08-2013-0324

Ray, G., Muhanna, W. A., & Barney, J. B. (2005). Information Technology and the Performance of the Customer Service Process: A Resource-Based Analysis. *MIS Quarterly*, *24*(4), 625–652. https://doi.org/10.2307/3250951

Sabella, A., Kashou, R., & Omran, O. (2014). Quality management practices and their relationship to organizational performance. *International Journal of Operations & Production Management*, *34*(12), 1487–1505. https://doi.org/10.1108/IJOPM-04-2013-0210

Sadikoglu, E., & Olcay, H. (2014). The Effects of Total Quality Management Practices on Performance and the Reasons of and the Barriers to TQM Practices in Turkey. *Advances in Decision Sciences*, *2014*, 1–17. https://doi.org/10.1155/2014/537605

Sáenz, J., Aramburu, N., & Rivera, O. (2009). Knowledge sharing and innovation performance. *Journal of Intellectual Capital*, *10*(1), 22–36.

Shao, Z., Feng, Y., Hu, Q., & Liu, Y. (2009). A conceptual model for studying the influence

of charismatic leadership on ERP implementation lifecycle. *Proceedings of the 42nd Annual Hawaii International Conference on System Sciences, HICSS*, 1–9. https://doi.org/10.1109/HICSS.2009.7

Tekin, A. T., Özkale, L., & Ayhan, G. (2018). *The Importance of R & D Investments in Information and Communication Technologies and Tax Policies Applied Through Information and Communication Technologies*, 155–166.

Tippins, M. J., & Sohi, R. S. (2003). IT competency and firm performance: Is organizational learning a missing link? *Strategic Management Journal*, *24*(8), 745–761. https://doi.org/10.1002/smj.337

Valinejad, F., & Rahmani, D. (2018). Sustainability risk management in the supply chain of telecommunication companies: A case study. *Journal of Cleaner Production*, *203*, 53–67. https://doi.org/10.1016/j.jclepro.2018.08.174

Wang, Z., & Wang, N. (2012). Knowledge sharing, innovation and firm performance. *Expert Systems with Applications*, *39*(10), 8899–8908.

Wong, S.K.S. (2013). Environmental Requirements, Knowledge Sharing and Green Innovation: Empirical Evidence from the Electronics Industry in China. *Business Strategy and the Environment*, *22*(5), 321–338.

Lewin, A. Y., & Minton, J. W. (1986). Determining organizational effectiveness: Another look, and an agenda for research. *Management Science*, *32*(5), 514–538.