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Reviewing the Mediating Role of Quality Management Capabilities on the Effect of Information Technology on Organizational Performance

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Abstrac:

Information Technology (IT) is considered as an important element of any organization. Its effect on global business is becoming widely felt. Also, it is extremely argued that IT is rapidly becoming the most important factor in increasing organizational performance and productivity. Also, quality management is also one of the most important management philosophies directed towards improving organization performance. The purpose of this paper is to reviewing the literature regarding the mediating role of quality management capabilities on the effect of information technology on organizational performance

Keywords:

Information technology, quality management capabilities, organizational performance

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1. Introduction

Researchers stressed the crucial enabling factors of applying numerous Information Systems (IS) and specific Information Technology (IT) services (e.g. Masa'deh, et al., 2008, 2013a, 2013b; Karajeh and Maqableh, 2014; Maqableh and Karajeh, 2014; Al-Dmour et al., 2015; Almajali and Maqableh, 2015; Kateb et al., 2015; Maqableh et al., 2015; Masa'deh, 2016a, b; Tarhini et al., 2015; 2016, 2017a, 2017b; Almajali and Al-Dmour, 2016; Almajali et al., 2016; Alenezi et al., 2017; Aldmour et al., 2017a, b; Khwaldeh et al., 2017; Mikkawi and Al-Lozi, 2017; Obeidat et al., 2017; Yassien and Mufleh, 2017; Tarhini et al., 2018; Al-Dmour et al., 2019; Masa'deh, et al., 2019a, b; Obeidat et al., 2019). Also, scholars called for more research on Quality Management Capabilities (QMC) and its relationship with organizational performance, hence, the current research aims to explore the linkage among IT, quality management capabilities, and organizational performance.

This research demonstrate the definitions, characteristics and evolution of the study dimension's based on previous researches which were classify into sections; the first section represents information technology and its dimensions; electronic data interchange and enterprise resource planning. The second section represents quality management capabilities and its dimensions; customer and supplier relations and product design. Third section discusses organizational performance and its dimensions; customer satisfaction and customer responsiveness. Furthermore, the last section shows the previous studies that examined the effect of information technology on organizational performance as well as the effect of quality management capabilities on organizational performance.

2. Literature Review

2.1. Information Technology (IT)

Hajli et al. (2015) defined IT as the set of computer software, computer hardware, and communications equipment the way in which it is currently reflected in the organizational performance. IT services must satisfy and support the organization demands. Another definition of IT refers to the different ways of exchanging information by computers through IT technologies such as electronic data interchange and enterprise resource planning (Madanhire and Mbohwa, 2016). In addition, the increasing use of IT is very important to the purchasing function in terms of customer and supplier relations and reflects the demand for tools that can facilitate information exchanges, communication (Rodríguez-Escobar and González-Benito, 2015). More organizations are seeking to make maximum use of IT to increase their performance. These technologies provide fast, accurate information, and business efficiency that are relatively inexpensive (Achimugu et al., 2009). Many researchers found that IT could significantly influence an organization competitive advantage and their opinion that the technologies of IT in various areas of quality management (QM) is growing and continually expands (Wai et al., 2011).

Using IT in quality management processes may result in improving operational performance measures such as improves flexibility, faster delivery and improving costumer and supplier relationship (Sanchez-Rodriguez and Rafael Martinez-Lorente, 2011). Previous literature has devoted valuable interest to the effect between IT and quality management studying such issues a show technologies impact various aspects of quality management such as customer and supplier relations and product design (Kock, McQueen and Corner, 1997).

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Different researchers have referred to different dimensions of information technology. According to Mulligan and Gordon (2002) discussed the information technology that has an impact on customer and supplier relationships through three dimensions (EDI, Audio response and Web-based). Johnson et al. (2007) there are two measures of information technology: electronic data interchange and Computer-aided design. Rodríguez-Escobar and González-Benito (2015) discussed the information technology that impact of purchasing performance through three dimensions which are Base system, Purchasing system, and Communications System.

According to (Sanchez-Rodriguez and Rafael Martinez-Lorente, 2011; Madanhire and Mbohwa, 2016) information technology definition and for the purpose of this study information technology will be dimensioned through Electronic data interchange and Enterprise resource planning.

2.1.1. Electronic Data Interchange (EDI)

EDI is used in managing the information flow with customers and suppliers. It still in one of the most widely used technologies among organization departments and external customers (Johnson et al., 2007). EDI can be defined as a type of electronic commerce (EC) that allows organizations to exchange information and business documents electronically in a structured by machine-readable format (Kelsey, 2015). Sanchez-Rodriguez and Rafael Martinez-Lorente (2011) discussed the importance of EDI that influences on quality management capabilities (customer and supplier relations) to gain performance advantages for organizations. Therefore, EDI systems are used to share data between suppliers and customers in standardized formats through computer networks. It provides fast, accurate information, and business efficiency to the organization (Bhatt, 2001). EDI has facilitated the expansion and increase the flexibility of the inter-firm commercial trade that improves organization performance because it reduces the need for supervision while increasing the systematization (Rodríguez-Escobar and González-Benito, 2015). The use of EDI systems requires integration across the organization's legal boundaries, encompassing a network of suppliers and the company. However, the establishment of these linkages rests on the assumption of the compatible IT infrastructure between suppliers and the company (Emmelhainz, 1993). EDI systems result in reducing the co-ordination costs, which would induce a company to make more use of markets place that means by using electronic networks, a firm can reduce costs of communication, co-ordination and logistics by exchanging a larger volume of information in less time (Johnson et al., 2007). According to Ngai and Gunasekaran (2004), there are some factors that significantly increase success in the adoption of EDI in organization, these include technology infrastructure, workers skills in IT and top management support.

Finally, EDI is a technology used to transmit the business documents (such as orders, invoice, shipping contracts, and so on) electronically to improve the quality of customer and supplier relations, and product design to gain organization performance advantages (Takaishi et al., 2017).

2.1.2. Enterprise Resource Planning (ERP)

ERP is a management information system that optimizes the distribution of enterprise resources and helps an organization to integrate all its resources for effective application to improve its operational performance and enhance its competitiveness (De Toni et al., 2015).

Moreover, ERP is defined a business software system that allows organizations to integrate and automate the majority of its business processes, share data and practices across the enterprise and access information in a real-time (Sammon and Adam, 2005). ERP system is ability to manage multiple areas of a firm including sales and purchases, production planning and scheduling, process design, inventory management, and quality control (Gupta and Kohli, 2006). Nonino and Panizzolo (2007) commented that ERP leads to different benefits as an increase in productivity, a higher level of efficiency in the information flow, better warehouse management, and costs reduction. Managers have also reported that the integration between ERP systems and quality management is also important for managing customers and supplier relationships and managing the product and process in the best ways (Foster and Ogden, 2008). Previous studies had argued that ERP implementation positively affects an organization performance when the enterprise information system implementation directly interacts with quality improvement systems (Laframboise and Reyes, 2005; Schniederjans and Kim, 2003; Laframboise, 2002). A recent study by Madanhire and Mbohwa (2016) defined ERP as a computer system that keeps managers informed about what is happening in real-time throughout a corporation and its global connections. Shen et al. (2016) showed that enterprise resource planning systems have been used in integrating information and accelerating its distribution across functions and departments with the aim to increase organizations' operational performance. Another research by Gloor et al. (2017) theme focuses on the details of implementing ERP and their related success and benefit. In their study pointed out that implementing an ERP system not only increased customer satisfaction and reduced operational costs but also eventually resulted in increased profits and growth of an organization. Finally, ERP is a functional software tool that supports the areas of logistics, planning, finance, manufacturing, procurement, human resource, project management, distribution, accounting, service maintenance, and transpiration. Therefore, the primary benefit of an ERP system relates to the integration of data and processes, and improved business efficiency (Mahmud et al., 2017).

2.2. Quality Management Capabilities (QMC)

Quality management has been regarded as a key strategic component of competitive advantage that has been received much concern for today's organizations (Soltani et al., 2011). Most organizations are continuously enhancing their performance by improving quality of their products, and services through various quality management practices (Patyal and Maddulety, 2015). Quality management practices help to obtain quality goals and support top management in attaining quality improvement (Sousa and Voss, 2002). Quality management is a philosophy that focuses on customer satisfaction and continuous improvement that enhances the organizational performance (Malik et al., 2012). Manufacturing companies explore quality management as a strategic weapon for improving their competitive advance. Along with other factors such as information technology, quality management can extremely explain the high performance in terms of conformance quality, manufacturing cost, dependability, flexibility, time, and customer service (Phan et al., 2011). The term capability refers to resources and abilities. According to Power (2014), quality management capabilities refers to the ability of an organization to identify, utilize, and assimilate both internal and external resources/information to facilitate the completion of quality management activities in order to develop products and services that satisfy or exceed customer expectations. Cho, Jung and

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Linderman (2017) demonstrated that behavior-oriented quality management capabilities such as support from top management, customer focus, and supplier relationship are the source of competitive advantage. In their study investigating of how quality management capabilities have a significantly positive influence on firm performance.

Different researchers have referred to different dimensions of quality management capabilities. According to Jung et al. (2009), there are three measures of quality management capabilities: employee relations, customer and supplier relations, product, and process management. Kaynak and Hartley (2008) defined five major elements that strengthen quality management capabilities: product design, customer focus, process management, training and quality data. For the purpose of this study, quality management capabilities concept will be illustrated through its mediating role between information technology and organizational performance, which consists of two dimensions: customer and supplier relations (CSR), and product design in accordance with study conducted by Sanchez-Rodriguez and Rafael Martinez-Lorente (2011).

2.2.1. Customer and Supplier Relations (CSR)

Customer supplier relations in a mean of transferring information between customer and supplier, both of them should provide information about quality assurance as a feedback (Oly Ndubisi et al., 2007). It also refers to ability to manage disruptions and respond better to fluctuating demands (Rajesh and Ravi, 2015). Customer supplier relations can be defined as the extended relationship between suppliers and customers based on confidence, credibility, and mutual benefit (Kuo et al., 2016). Customer supplier relations can be understood as a set of business activities supported by both technology and processes that is directed by strategy and is designed to improve business performance (Dawson et al., 2017). It is necessary to identify the customer needs and achieve their level of satisfaction. Information technology plays a significant role in supporting relationships between the customer and the supplier using electronic data interchange to share data between both sides, this technology provides fast, accurate information, and business efficiency to the firm (Mulligan and Gordon, 2002). Danese and Romano (2011) investigated the distinct contribution of integrating internally with customers and suppliers to improve different dimensions of performance, such as cost containment and reliability.

In relation to quality, the firms should be cooperating with both the suppliers and customers to improve the quality of product and services, thus, meeting the customer needs (Sanchez-Rodriguez and Rafael Martinez-Lorente, 2011).

2.2.2. Product Design

All departments within the organization have to participate in the design process and work together towards achieving the product design which meets the customer requirements (Sanchez-Rodriguez and Rafael Martinez-Lorente, 2011). Indeed, achieving a market success for some product clearly relies on identifying and satisfying the customer needs at a reasonable price. The product should be developed according to the customer perspective, demands vary from a customer to another, and thus, product features would be different (Gangurde and Akrate, 2015). Enterprise resource planning is one of the most appropriate technologies used to clarify the effect of information technology over the product design, enterprise resource planning systems were chosen because of their ability to manage multiple areas of an organization including sales and purchases, production planning and scheduling, process

design, inventory management, quality control and human resources management (Gupta and Kohli, 2006). During the product design and development, the information technology facilitates making different functions and activities; it also makes communication between departments easier. In result, the product design which is subjected to information technology leads to a reduced development time, a reduced cost and an increased quality (Caputo and Pelagagge, 2008). According to Gruhier et al. (2017), product design has been done by considering the integration of lifecycle constraints and knowledge in product design so as to deliver best products; this means that such effort has anyway provided competitive advantages in efficiency and flexibility by improving designers' awareness and product quality.

2.3. Organization Performance

These days, organizations are working hard to keep up to the changes happening around them by boosting the performance base of the competition they make. Organizational performance as the ultimate dependent variable that is affected by all areas of management, and this is why the researchers consider it, because the performance gives the researchers the needed info to compare the organization to its competitors (Obeidat et al., 2016). Organizational performance can be defined as the degree to which an organization is able to meet its own needs and the needs of its stakeholders in order to survive (Middleton et al., 2003). Carton (2004) suggested that organizational performance is the voluntary association of productive assets that lead to the achievement of shared purpose. Organizational performance can also be defined as the ability to acquire and process the five resources which are the human, financial, physical, information, and technology resources in a way to achieve the organizational goals and objectives (Ramezan et al, 2013). Organizations that keep monitoring their performance are more effective and efficient in terms of uncertainty, ambiguous and risk (Obeidat et al., 2016). Tsai and Yen (2008) suggested that organizational performance can be measured by using two performance aspects, social and innovation performance in addition to Financial and market performance. Organization performance can be measured by using Mitchell's four dimensions which include relevance of the company to stakeholder needs, the efficiency of the company, effectiveness of the company and the financial viability of the company (Mitchell, 2002). Lee et al. (2008) provides another way form measuring organizational performance through stakeholder's satisfaction, organizational communication, team collaboration, strategic performance, knowledge management, and organizational growth.

Finally, Yaghoobi and Haddadi (2016) commented that measuring organizational performance involve non-financial through three dimensions which include: internal business processes customer, learning and growth. For the purpose of this study, the dimensions of non-financial performance will be used to measure organizational performance explained by its two main dimensions that include customer satisfaction and customer responsiveness, based on the study conducted by (Abdel-Maksoud et al., 2005; Digalwar et al., 2013).

2.3.1. Customer Satisfaction

Customer satisfaction is a main factor of an organization's success. Customer satisfaction is defined as a customer feelings of pleasure or disappointment that conclusion from comparing a product's perceived outcome with his/her expectations (Kasiri et al., 2017). Olsen et al. (2014) commented that and in order to increase customer satisfaction, organization must obtains and uses information from customers, develops a strategy to meet customer needs, and implements that strategy by being responsive to customers and collect data from customers at

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is facton measurements and analyze them to improve organization performance. Chen (2012) reported that customer satisfaction had a positive influence on the customer purchase intentions and customer loyalty. In the study investigated the relationship between customer satisfaction and customer loyalty in the e-service context. More recent satisfaction definitions concede is an essential factor related to a company's future profit by increasing customer loyalty (Kim et al., 2015). In industrial markets, customer satisfaction as an important part of business strategy and a key driver of profitability and market value (Jean et al., 2016). According to Pizam et al. (2016), customer satisfaction is the leading criterion for determining the quality that is actually delivered to customers through the product/service and by the after sales service.

Finally, various studies have found that higher level of customer satisfaction ultimately leads to a customer loyalty and word of mouth recommendations (Kasiri et al., 2017; Lai et al., 2006).

2.3.2. Customer Responsiveness

Customer Responsiveness may be one of the most important capabilities needed for organization to achieve competitive advantage (Santos Bernardes and Hanna, 2009). Reichhart and Holweg (2007) regard responsiveness as equal to the delivery lead-time for a certain product. Many companies emphasize the customer responsiveness and quality as a means to stay in business over their lifetime (Kasiri et al., 2017). Noordin et al. (2012) stated that customer responsiveness as the extent of capability of a firm in providing speedy services, variety of services, and desire to help customers within the service delivery system. Customer responsiveness can be defined by the actions taken in response to market with emphasizing individual's needs of target customer. For the industrial firm, customer responsiveness can be met by added-value activities as building relationship with customers and solving customers' problems (Pehrsson, 2014). In other words, customer responsiveness is the ability to react within an appropriate time-scale to customer demand or changes in the marketplace, to bring about or maintain competitive advantage (Mandal, 2015). According to Iberahim et al. (2016), responsiveness is defined as the ability to respond to customer requirements timely and flexibly. Additionally, customer responsiveness refers to the probability of fulfilling a customer order within a quoted lead-time. Compared with other measures of responsiveness such as expected lead-time this definition reflects the likelihood of a customer receiving his order at a preferred due date (Hum et al., 2018). Finally, responsiveness in the eyes of end customers, combining short lead times with high conformance quality to offer high adaptability to demand fluctuations. Therefore, profitability increases because of reduced distribution inventories, fewer quality and maintenance issues, higher sales growth, and better customer retention (Schonberger and Brown, 2017).

3. Information Technology and Organizational Performance

Ongoing studies of organizational performance and information technology aim to identify the effect of information technology on the organizational performance. They suggested that information technology and the complementary resources of the firm affect the effectiveness of business processes with consequently improved organizational performance; they also concluded that investment on IT leads to a lower average total cost per unit of output (Cetinkaya et al., 2014; Liang et al., 2010). Benitez-Amado et al. (2010) stated that IT resources such as technological IT resources can enable a firm to improve its ability to develop a working

environment that encourages creativity and rapid development. Among the many studies that have investigated the relationship between information technology and organizational performance, Pérez-López and Alegre (2012) argued that information technology is related to firm performance. Additionally, they proposed that IT competency, on its own, is insufficient to generate and maintain a competitive advantage. Firms need complementary strategic capabilities such as knowledge management to strengthen the effect of IT competency on firm performance. Mandal and Bagchi (2016) demonstrated that information technology with no doubt is exerting ever increasing influences on corporate growth and profitability. Sustainability can also be enhanced through technology, information and knowledge; all of which can create competitive advantage and add value in markets. Another study by Lindh and Nordman (2017) showed that information technology ability to contribute to performance in industrial markets. His study also revealed that the information technology acts as an agent for increasing strength and performance in business in industrial markets.

4. Information Technology and Quality Management Capabilities

Information technology is strongly related to all quality management capabilities. Therefore, the use of Information technology to facilitate quality management and initiatives is definitely growing and is being an essential ingredient to quality success. This is mainly supported in the literature by the work of various researchers. The work of Dewhurst et al. (2003) and Mjema et al. (2005) can be used to demonstrate this ever-increasing need to use Information technology to support quality management and the resulting increase in impact of Information technology on quality management. Dewhurst et al. (2003) examine the various beneficial impacts that information technology may have on quality management capabilities. Their findings indicated that quality management capabilities needed information technology in order to improving customer and supplier relationship, improving design process and improving the decision process in quality departments. Another study by Wai et al. (2011) indicated that the firms should in no way switch their focus from quality to information technology, but instead focus on how information technology can be used to enhance quality management capabilities. In their study revealed that manufacturing organizations were making more use of information technology to support quality management capabilities within their current information technology capabilities. Hassab Elnaby et al. (2012) reported that firms seek to improve or maintain their competitiveness by using information systems (electronic data interchange and enterprise resource planning) to improve quality management capabilities (customer and supplier relations, product design and customer service) in order to get shorten cycle times and reduce cost. In their study these information systems enable firms to achieve competitive advantage and superior long-term performance. Khanam et al. (2016) found the role of information technology for quality management to enhance the organizational performance.

5. Conclusion

Quality management is a collection of management principles, practices and techniques to improve organizational performance. Therefore, quality management approach helps in improving business performance and satisfying demands of internal external customers (Lenka et al., 2010). Sanchez-Rodriguez and Rafael Martinez-Lorente (2011) examined the effect of quality management capabilities on organizational performance. Their findings also confirmed the interaction between quality management capabilities and organizational performance by showing that quality management capabilities are likely to influence both quality performance

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and organizational performance. Sabella et al. (2014) measured the relationship between organizational performance and quality of management. Their findings indicated that companies needed quality management in order to improve the organizational performance to enhance their responsiveness. Therefore, quality management is substantially good for any organization as long as they are implemented the right way. A recent study by Jiménez-Jiménez et al. (2015) studied the relationship between organizational performance and quality management. Their study also revealed that quality management can be defined as an integrated effort to achieve and maintain high-quality products based on the maintenance of continuous process improvement and error prevention, at all levels and in all functions of the organization, with the aim of reaching and even exceeding customer's expectations. Another study by Al-Dhaafri et al. (2016) stated that organizational performance can be positively affected by quality management. In their study investigated the relationship between quality management and organizational performance in Dubai organizations.

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