Journal of Positive School Psychology
2022, Vol. 6, No. 3, 4757 – 4763

http://journalppw.com

The effect of information technology on supply chain capabilities within Abu Dhabi monitoring and control center in UAE: A review

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Abstract

Information technology (IT) is being used increasingly by organizations to enhance the capabilities of the supply chain. Nevertheless, previous research indicates that the investing in IT is not enough to ensure better organizations outcomes. This study, based on the resource-based view, suggests that supply chain capabilities of information technology (IT) are organization-specific, and difficult to generalize to other organizations. Such capabilities have the potential to work as a catalyst in improving the value of the IT-related resources for a firm. The current study focuses on these issues based on studies obtained from supply chain capabilities and managers of logistics within Abu Dhabi monitoring and control center in UAE. The results generate a new viewpoint in the investment in IT in the supply chain capabilities.

Keywords: Information technology, Supply chain capabilities , UAE.

1. Introduction

The United Arab Emirates (UAE) has recently been listed among the world's fastest-developing economies (World Bank, 2016) in the Middle East, Gulf zone, and North Africawith the aim of ranking among the highest economies focusing on service (Ibrahim & Al Falasi, 2016). The economy of the UAE is highly diversified with more than 180 nationalities and involves turism, development, logistics, banking and finance, diverse communities, faiths and ethnic backgrounds (Jabeen et al., 2015). Therefore, Abu Dhabi Monitoring and Controlling Center abbreviated as ADMCC was founded by the law No. (5) 2011. Managing and regulating the implementation of Monitoring and control system in locations and important facilities, public and private facilities, and analyzing information presented by the systems form the main aim of this centre. It aims at preventing crime and detecting offenders, saving security and public order in the Emirates, and continues working on monitoring and controlling systems and their integration and interdependence with different monitoring systems in the UAE (AMMCC, 2020). ADMCC aims at providing provide modern and sophisticated service for monitoring and controlling system, as well as providing Electronic follow-up to ensure the system effectiveness (AMMCC, 2020). Therefore, logistics are not only major drivers for a city or district, but also for the entire country.

Abu Dhabi technical path began the first ICT program which was implemented in 1999 and Abu Dhabi Internet City, Abu Dhabi e-Government, Abu Dhabi Smart Government and Smart Abu Dhabi opened in 2014(Ameen et al., 2018). Several urban development initiatives in the region have led to the public's recognition and implementation of ICT in all aspects of existence during the last 20 years. Currently, Abu Dhabi, a city of 2.7 million residents and one of the seven UAE Emirates, has one of the fastest ICT adoption levels in the world, for both the public and government (Statistical Yearbook of Abu Dhabi, 2018). Abu Dhabi has produced outstanding living standards and an unparalleled

economic environment (Ameen et al., 2018). Moreover, limited studies have dealt with the implementation degree of the practices of IT in SCM practices within countries and how they perform in the countries of the Middle East. Arvis et al. (2017) conducted a study measuring the performance of logistics of 150 countries worldwide. Figure 1 illustrates performance ranking of some of the UAE neighborhood countries. In their study, Singapore was rated the highest for all indicators with 4.19 score, with UAE considered in top 20 with the (LPI) score of 3.73.. It is motivating to note placing the countries of the Middle East among the highest 50 countries out of 150, and it encourages us more to explore in depth the performance indicators related to IT among the operating companies in UAE as shown in figure 1.(*see online version for colours*).

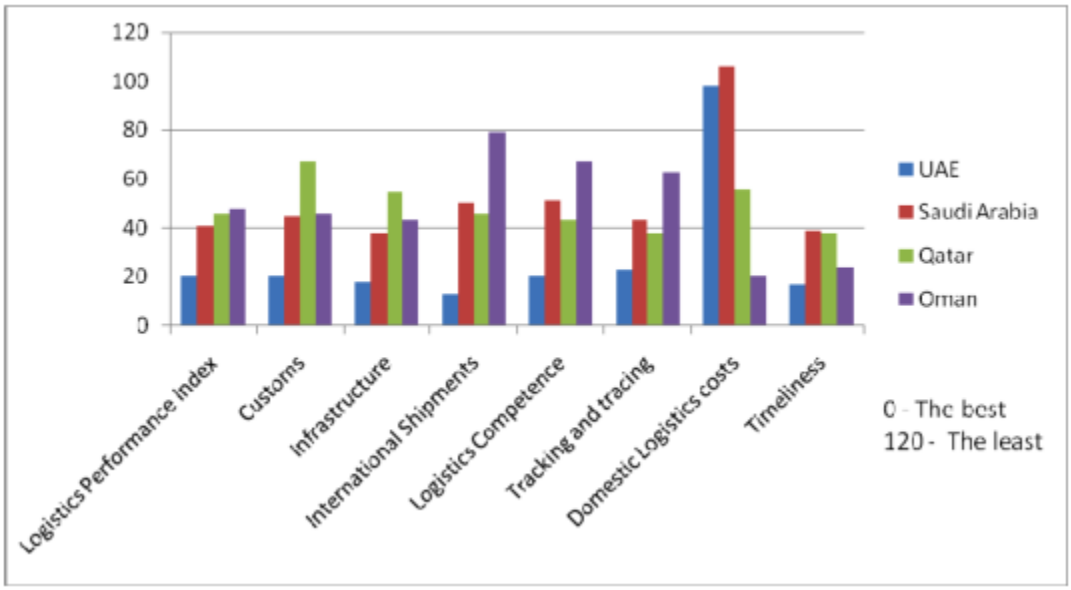

Figure 1 Comparison of logistics practices of UAE with neighboring countries
Source: Arvis et al. (2017)

The Supply Chain Capabilities (SCC) includes the functions connected to one another in the process of providing products to a manufacturing company and, after that, manufacturing and providing the market with the finished goods (Xu et al, 2016 ; Jimenez-Jimenez et al., 2019). Through supply and demand relationships, companies involved in this process stages are linked together. They can enhance the flow of products from supplier to customer, minimize inventory and expenses to a minimum, and show quick reaction to changes in demand by engaging companies in the supply chain by exchanging information and organizing their activities (Khan et al., 2015; Jimenez-Jimenez et al., 2019).

A crucial part is taken by the increasing development of information Technology (IT) with communication technology in supply Chain Capabilities (SCC) a in improving selections in the flow of the supply chain network to meet organizational aggressiveness, rising service level, lowering inventory, supply chain expenses and minimizing electronic problems (Sanders & Premus, 2016; Xu et al, 2016).

IT introduces many essential applications to promote the supply chain performance. Development of IT has helped companies to build and maintain adaptive organisations that can show a quick reaction to different circumstances and demands (Kimani, 2016). IT, which involves the implementation of software, hardware and networks, has the ability to improve the movement of information and promote making decisions in supply chain and logistics beside enhancing the performance of supply chain

performance. Although these lessons are useful for managers, little research has been done on how to deploy IT efficiently to enhance the SCC efficiency. In producing a highly competitive advantage and specialty, IT can be considered as an important player in contemporary organizations. Most organizations select it for the better understanding it gives regarding both the customers and their requirements. This study investigates the IT impact on supply chain capabilities within Abu Dhabi monitoring and control center in UAE.

2. Literature review

2.1. Information technology (IT)

Some studies grounded in the resource-based view theory have stated a firm's ability to establish and employ new technologies, or IT capabilities, to organizational processes leads to sustainable competitive advantage (Sanders & Premus, 2016; Xu et al, 2016). IT is defined as technological capability utilisedfor acquiring, processing and transmitting information to support organizational decision-making (Jimenez-Jimenez et al., 2019) and facilitating communication, coordinating and collaborating between numerous parties along the supply chain. Considering the above, IT capabilities can be classified into three types, namely: (1) crossfunctional (intra-organizational) application capability and (2) supply chain (interorganizational) application capability and (3) data consistency as an application control goal assuring the quality of data input across these integrative applications (Sanders and Premus, 2012). By using resource planning for enterprises, immediate data searching of inventory and operating data, cross-functional application capability enables the integration of data and information system within a firm. It also facilitates exchanging information, communication and collaboration of functional departments of the firm.

2.2. Supply chain capabilities(SCC)

The strategic or fundamental objective of supply chain man-agreement is the continuous and planned improvement of processes and relationships (Chain Supply), Chain Demand , and Chain Value, and Supply Chain capabilities, business main processes and relationships, which starts with inputs and ends with outputs (Jimenez-Jimenez et al., 2019; Xu et al, 2016). Ganbold et al., (2020) argue that is a bid to create a combination of supply and demand management (internally and internally), and it also implies and integrates the core business processes within a network of dependencies between the centers of supply, in order to enhance goods, services and information movement from the main supplier to the end customer.

The RBV illustrates that a firm's source of the sustainable competitive advantages forms the internal resources.(Ganbold et al., 2020). It is noted by Barney (1991) that a firm creates its own value by integration heterogeneous and steady resources that are valuable, imitable, rare and non-substitutable. The supply chain capabilities was defined by Wu et al. (2006) as the capacity of a firm to classify, apply and adapt external resources in supporting all supply chain activities. Furthermore, Lee et al. (2016) expressed that a firm's owned resources can highly affect a firm's management and, as a result, promote the whole supply chain performance. We can conceive the capabilities of the supply chain as a second construct in order. This construct involves three dimensions: activity integration, coordination , and the responsiveness of supply chain. These three dimensions are selected representing the essential operations included in the supply chain.

2.2.1. Coordination

A firm's capacity to arrange activities related to transaction with supply chain parties is referred to as Interfere coordination (Jimenez-Jimenez et al., 2019; Xu et al, 2016). The materials, manpower, money, and capital equipment coordination from taking the order to its follow-up forms the coordination with supply chain partners (Xu et al, 2016). This coordination is an important indicator in assessing the supply chain capabilities of a firm since it helps minimize transaction expenses and increase operational efficacy between supply chain partners (Ganbold et al., 2020).

2.2.2. Activity integration

Companies integrate their activities across channel partners and internally (Jimenez-Jimenez

et al., 2019). We emphasize on integration across channel partners in this inquiry. Interfere channel integration is seen as a process of two dimensions: interfere technology integration and activity integration. The degree of technology agreement with channel partners represents technology integration, whereas integration of activity is conceived as a firm's strategic channel activities coordination with the supply chain parties like planning and forecasting (Xu et al, 2016; Jimenez-Jimenez et al., 2019). As illustrated from literature, they could not be clearly differentiated as two distinct dimensions. The integration of technology with channel partners does not ensure that, after the introduction of such technology, the supply chain activities are automatically incorporated. For achieving activity integration with their partners, firms have to necessarily change their methods of carrying out work with channel partners from disconnected to consistent and continuous transactions (Ganbold et al., 2020).

2.2.3. Supply chain responsiveness

The responsiveness of supply chain is characterized as the degree of channel members reaction to the changes of the environment cooperatively. (Xu et al, 2016). Efficient, reliable and collaborative responses are required for today's marketplace which is considered complicated. (Jimenez-Jimenez et al., 2019). The supreme form of learning is to be able to take decisions and to subsequently respond to the collected information (Ganbold et al., 2020). Therefore, the responsiveness of the supply chain is considered as main dimension of the supply chain capabilities of a firm..

2.3. Impact of information technology on supply chain capabilities

To support the hypothesized relationship between three types of IT and three SCC types, the study adopts resource-based view and relational view theories. In line with the core tenets of resource based view theory which posits that a firm's ability to establish and employ innovative technologies and organizational processes will lead to sustainable competitive advantage (Yu et al., 2018; Sanders & Premus, 2016; Xu et al, 2016), well-developed IT capabilities, namely, crossfunctional applications, supply chain applications and data consistency, seen as unique capabilities, can serve as an enabler for supply chain capabilities. Moreover, taking into consideration the additional source of competitive advantage associated with supply chain capabilities and supported by the relational view theory (e.g. Patnayakuni et al., 2006), the firms would apply their IT capabilities not only for internal supply chain capabilities, but also to support inter-organizational, external supply chain capabilities efforts (Ochoa et al., 2017; Fuchs et al., 2018; Ganbold et al., 2020). We, therefore, predict that the higher levels of supply chain application, cross-functional application and data consistency capabilities will result in a greater degree of supply chain capabilities among an organization's internal functions andin relation to customers and suppliers.

3. The Research framework

The capabilities of a firm are, as stated by the RBV, its basis for continuing to develop and improve its competencies through continuous and cooperative learning (Powell et al., 1996). Cao et al., (2010) defined the SCC capability as the long-term partnership process of a firm where supply chain partners with shared objectives cooperate with each other to accomplish mutual benefits that are higher than the advantages achieved separately. SCC involves various interconnected dimensions like information sharing, decision synchronization, resource sharing, joint knowledge creation, and incentive alignment (Cao et al., 2010). Reference is often made to ITs employment to improve collaboration in the supply chain.

IT can be described, according to the RBV, as a resource and a capability.IT refers, as a resource, to the ITs use like networks, software, hardware, IT support services and data management by a firm. The collaboration of IT resources for acquiring, processing, and transmitting information forms the capability of IT. This combination streamlines business processes, supports decision-making and facilitates communication and organization within an organization and with external parties (Wang et al., 2015). It is suggested by the recent studies that the IT capability development has the possibility to enable SCC (Sanders & Premus, 2016; Xu et al, 2016). Therefore, it would be

logical to expect a positive relationship between the capability of IT and SCC. Therefore, we propose:
H1. Information technology is positively related with SCC.

Based on the previous literature, the following conceptual framework is proposed as shown in Figure 1.2 The main constructs of this study are IT, (Data consistency, Cross-functional application and Supply chain application). The research model postulates IT (independent variables) and SCC (dependent variable). This model was adapting from (Ganbold et al., 2020 and Wu et al., 2006).

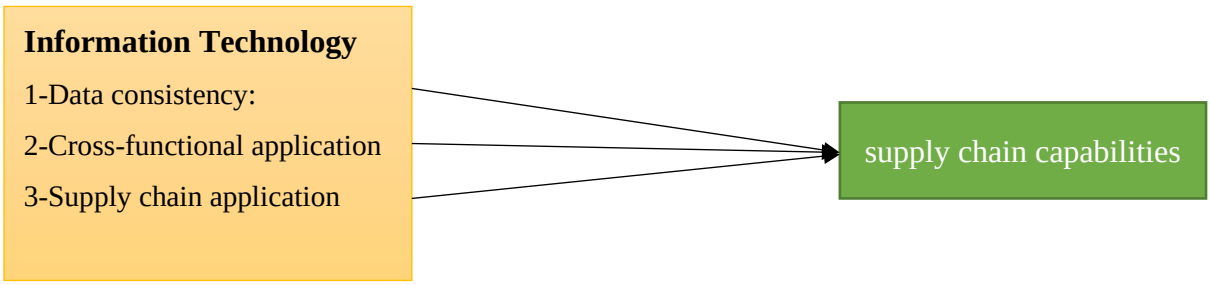

Figure 1.2 Research framework

4. Discussion

The findings of this research can support the existing literature in the field of IT and supply chain capabilities. In addition, two implications can be categorized from the contribution of this research, which are empirical and practical implications. By confirming the path relations of the model under study, the findings of empirical evidence have supported the framework of the research. The findings have managerial implications for practitioners by exposing the IT to supply chain capabilities as well. The business competition , however, happens between the supply chains nowadays. This practice emphasized the need of IT to facilitate the supply chain capabilities. According (Jimenez-Jimenez et al., 2019; Xu et al, 2016) The results of the current study provide the model under study with considerable empirical support. The hypotheses of this research have been fully supported. This is a main study that is looking to Abu Dhabi Monitoring and Controlling Center.

5 Research challenges

The historical evidence describes the upstream directions and strength of relationships between IT (data consistency, supply chain application and cross-functional application), and supply chain capabilities in different industrial and trading concerns around the world. The trading Abu Dhabi monitoring and control centers in Abu Dhabi were neglected in the past and this may create ambiguity regarding the IT capacity of these centers in the above-mentioned areas. Also, the upgradation of an intelligent information may enhance the impact of IT in achieving in the supply chain capabilities of trading Abu Dhabi monitoring and control centers.
Considering the above research problems, the study aims to achieve the following objectives regarding Abu Dhabi monitoring and control center in UAE:
1.To confirm the upstream link and importance of ITin achieving supply chain capabilities,
2.To verify the direct and significant impact that IT on supply chain capabilities,
3.To confirm the positive and durable capacity of IT in realizing the supply chain capabilities.

6. Conclusion and recommendations

The purpose of this research was to investigate the IT on supply chain capabilities within Abu Dhabi monitoring and control center in UAE, which is the capital of United Arab Emirates. There are increasingly demanding customer expectations. More customers demand instant services from enquiries. Such expectations can only be satisfied by making authentic and real-

time information readily accessible. IT and supply chain capabilities are the methods of producing related and timely information. IT became a necessity rather than a competitive edge as more companies adopt it to improve customer service. Abu Dhabi monitoring and control center in UAE staff believe that IT is a necessity for improve supply chain capabilities. Furthermore, the study also suggests that utilizing IT does not necessarily result in benefits. Thus, companies in UAE will need 'educating' their senior managers on employing IT benefits to streamline their supply chain capabilities operations to decrease cycle time and enhance supply chain capabilities visibility. While IT for transactional processing has been implemented by most of the studies, we can do moreto introduce IT for planning and better method for making decisions for supply chain capabilities.

The authors argue that Middle East countries are a wide scope to develop this research though excellent qualitative research had been conducted in the field of IT and supply chain capabilities in other parts of the world. However, there exist great opportunities for this study to be extended across countries. It can also be compared to other leading logistics economies such as Hong Kong and Singapore.

Acknowledgement

The authors would like to thank Universiti Teknikal Malaysia Melaka UTeM for their direct and indirect contributions.

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