تأثير مرونة تكنولوجيا المعلومات على الاداء التنافسي للموانئ من خلال الدور الوسيط لقدرات سلسلة التوريد

(دراسة تحليلية لعينه من الافراد العاملين في ميناء ام قصر)

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المستخلص:

تُعد مرونة تكنولوجيا المعلومات وعلاقتها بالأداء التنافسي من المواضيع المهمة والتي ما زالت في المراحل الإستكشافية خصوصا في البيئات العربية، وتم الاعتماد في هذه الدراسة على القدرات الديناميكية. طبقت هذه الدراسة في الشركة العامه لموانئ العراق/ ميناء ام قصر في البصرة. أعتمدت الدراسة الحالية على ألمنهج الوصفي التحليلي وتم جمع بيانات الدراسة بأستخدام أداة الاستبانة التي وزعت على عينة الدراسة المتمثلة بـ 368 من الافراد العاملين. ومن خلال استخدام الاساليب الاحصائية في برنامجي (SPSS.V.24 _ AMOS.V.24) توصلت الدراسة لعدة استنتاجات وتوصيات. أهمها؛ وجود تأثير ايجابي ومباشر لمرونة تكنولوجيا المعلومات على الاداء التنافسي وغير مباشر من خلال قدرات سلسلة التوريد. وتوصي الدراسة بضرورة الاهتمام في قدرات سلسلة التوريد بما يخص سرعة الاستجابة والتنسيق، وتكامل النشاط واتاحة القدرة على نقل وتبادل المعلومات اذ ان دور مرونة تكنولوجيا المعلومات وتأثيرها الايجابي يظهر بشكل واضح، ويمتد تأثيره من خلال قدرات سلسلة التوريد الامر الذي ينعكس على تحسين الاداء بشكل عام للموانئ

الكلمات المفتاحية: مرونة تكنولوجيا المعلومات, قدرات سلسلة التوريد, الاداء التنافسي.

The Impact of Information Technology Flexibility on the Competitive Performance of Ports through the Mediating Role of Supply Chain Capabilities

(An analytical study on a sample of individuals working in Umm Qasr port)

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Abstract

The information technology of flexibility (ITF) and its relationship to competitive performance is one of the important topics that are still in the exploratory stages, especially in Arab environments, and this study was based on dynamic capabilities. This study was applied in the General Company for Ports of Iraq / um Qasr Port in Basra. The current study relied on the descriptive analytical approach and the study data was collected using the questionnaire tool that was distributed to the study sample of 368 working individuals. Through the use of statistical methods in my program (SPSS. V.24 _ AMOS. V.24) The study reached several conclusions and recommendations. The most important of which is the positive and direct impact of(ITF) on competitive performance and indirectly through supply chain capabilities. The study recommends the need to pay attention to the capabilities of the supply chain in terms of speed of response and coordination, integration of activity and the availability of the ability to transfer and exchange information, as the role of information technology flexibility and its positive impact is clearly visible, and its impact extends through the capabilities of the supply chain, which is reflected in improving the overall performance of ports.

Keywords: Information Technology Flexibility; Supply Chain Capabilities; Competitive Performance.

Introduction

In today's rapidly changing global economy, many organizations have embraced and leveraged advanced information technology to gain a competitive advantage over competitors, However the literature review is full of contradictories regarding the extent to which a company's adoption of information technology will affect organizational performance (Brynjolfsson and Hitt, 1996; Hou, 2020,). Several studies have found a positive correlation. Relationship between IT investment and organizational performance (Brynjolfsson and Hitt, 1996). Some studies of some U.S. factories found that manufacturers were increasingly relying on the advantages of information technology to improve supply chain agility, reduce time, achieve higher efficiency and deliver products to customers in a timely manner (Radjou, 2003 cited in Fasanghari, Roudsari and Chaharsooghi, 2008). On the other hand, the results of some studies indicated that there was no significant or negative relationship between investment in information technology and organizational performance (Brynjolfsson, 1993; Strassmann, 1990).

In addition, the adoption of a particular technology can also be adopted by other competitors, which in turn does not lead to the competitive advantage of the companies that have adopted this technology (Powell and Dent-Micallef, 1997). The question that can now be asked is how can IT management that will best achieve today's business goals? The answer is simply what Chanopas et al. (2006) put forward that IT must be flexible enough to deal with changes, and here some researchers have also pointed out that IT flexibility is an appropriate competitive weapon by organizations (Byrd and Turner, 2001; Kayworth et

al., 2001). Lean IT can deliver rapid results while supporting sustainable growth in an increasingly dynamic market environment, while agile IT can have detrimental effects on organizational performance – for example, freezing an organization into behavior patterns and processes that are strongly resistant to change (Han et al., 2017).

The concept of(ITF) is not a modern concept, as IT flexibility has been cited as one of the priorities of organizational or supply chain capabilities such as consistency (Duclos et al., 2003; Ngai et al., 2011) and supply chain response (Bush et al., 2010). The use of information technology with supply chain management can increase the organization's ability to develop accumulated knowledge about supply chain parties such as customers, suppliers and market demands, which in turn can affect the performance of the organization (Fasanghari, 2008). For IT flexibility to have a significant impact on performance, an organization must be able to leverage its information outputs. One way an organization can do this is by creating a strong market orientation. Some researchers suggest that the relationship between IT flexibility and performance should be mediated by variables such as supply chain capabilities (Chen et al., 2013: 1).

Contemporary organizations have begun to focus on the role of supply chain capabilities in knowing the relationship between IT flexibility, as a new ability to respond to changes, and achieve high levels of performance. Previous studies have discussed the relationship between IT flexibility and the competitive performance of organizations in different models and contexts, But the studies that dealt with the research variables combined are few. IT flexibility does not necessarily lead to competitive performance and IT infrastructure involves investing huge

amounts of money that can affect the entire organization and be difficult to change in a short period of time. Therefore, organizations must work to support change without having to start from scratch every time a new technological development is introduced because this costs companies a lot of money and takes a long time to implement. The Iraqi port sector suffers from many problems that constitute an obstacle to its various activities, as the capabilities of the current ports are not commensurate with the developments that have occurred in maritime transport fleets and transport patterns represented by container ships that require advanced port services such as high efficiency of workers and systems. Modern electronic and modern specialized cranes, fast performance and other problems. As they stand, Iraqi ports are not a source of attraction for modern ships .

In addition, the current study applies the study model in an important sector represented by the maritime sector, specifically the ports sector, which crystallizes its operations in the form of services that can be developed or improved if new and creative ideas are extracted, accepted and discussed. Therefore, the current study model is designed to investigate the relationships of IT flexibility variables, and then identify the mediating role of supply chain capabilities. To achieve this purpose, the previous literature will be discussed and the hypothesis constructed, and then we will address the study methodology and data analysis results. Finally, the findings will be discussed and theoretical and practical implications will be proposed, as well as proposals for future directions for researchers in the future.

Literature

Concept of IT Flexibility

In general, flexibility is a key element of information technology for organizations because many of them face increasing changes in the business environment (Byrd and Turner, 2000; Chanopas et al., 2006). Flexibility refers to the degree to which an organization's IT portfolio decomposes or disintegrates into subsystems associated with a particular form that communicate through modular interfaces (Wetering et al., 2017). IT flexibility can be referred to as the degree of share ability and reusability of the IT architecture that enables the ability to control management and the organization (Byrd and Turner, 2000), and therefore flexibility enhances management's ability to control management processes and achieve efficiency (Leeuw and Volbrda, 1996). Therefore, the flexibility of information technology is one of the most important factors that help provide the ability to adapt the organization to changes in the business environment and business processes, whether that change is gradual or radical change as soon as possible and make a minimum of effort and cost (Ngai et al., 2011). Flexibility refers to the ability by which technology can interact with a wide range of possible environments with few resources in terms of time, effort, cost and performance (Sethi and Sethi, 1990; Upton, 1995). In generally, there is agreement among researchers on the importance of information technology flexibility in terms of its ability to assist organizations in dealing with uncertainties in the external environment by developing, adapting or coordinating information technology functions in line with the nature of the dynamic environment and in harmony with it (Stank et al., 1999).

Supply Chain Capabilities

Many organizations have been forced to focus on supply chain capabilities due to their importance in achieving the organization's most important goals, which are its survival and achievement of competitive advantage (Lambert and Cooper, 2000). Therefore, we see that competition between organizations has become between a supply chain versus the existing supply chain of competitors and on this basis there is an urgent need to manage the supply chain process and give it increased attention in organizations (Carter et al., 2015). Dynamic business environments force the supply chain organization to integrate resources and capabilities and share them with both upstream and downstream supply chain partners to effectively achieve their intended benefits (Gligor and Holcomb, 2012). The most successful organizations are those that create flexible, adaptive and compliant supply chains and this success depends on the ability of all supply chain partners to focus on end customers and respond to changes in markets and attention to them by senior management and at the organizational and supply chain levels (Powell and Dent-Micallef, 1997). The success of each of the organizations that make up the supply chain depends on the ability of the overall supply chain to respond to changing customer requirements, restructuring the supply chain in response to changing markets, economic environments, and harmonizing production, marketing, and finance (Lee, 2004). This has been confirmed by a study conducted by Forrester Research that suggests that successful U.S. manufacturers are increasingly relying on the benefits of information technology in order to improve speed in the supply chain, reduce cycle time,

achieve higher efficiency, and deliver products to customers in a timely manner (Radjou, 2003).

Competitive Performance Of Ports

In the era of the global supply chain, the role of the port has evolved from the traditional functions of cargo handling and storage to modern operations to become an integral part of the global supply chain, and with the increasing demand for integrated logistics and the intensification of competition in ports, the port must cooperate with its partners to provide the best value-added services to port users (Robinson, 2002; Notteboom and Rodrigue, 2005). Several studies have pointed to the important role of the port in the context of supply chain management for competitive advantage (Paixao and Marlow, 2003; Woo et al., 2013). The concept of supply chain integration (SCI) in the port sector has received a great deal of attention and has been widely discussed in studies (Panayides and Song, 2008; Tongzon et al., 2009). However, SCI was somewhat limited in previous studies in two areas, firstly with regard to suppliers (labor supplier, equipment tenant, etc.) and second with regard to customers, shipping lines, inland transport operators (Yu, 2021). as none of the previous studies determined the extent of the real impact of SCI in terms of suppliers and customers, and although these important players in the port sector were included, they were ignored in the studies, meaning that most previous studies on SCI in ports focused solely on the plant operating organization and customers in order to achieve competitive performance (Panayides and Song, 2009; Song and Panayides, 2008; Tongzon et al., 2009; Woo et al., 2013).

Dynamic Capabilities

For the purpose of explaining how and why certain organizations have a competitive advantage in a dynamic environment of rapid and unpredictable change, the theory of dynamic capabilities (DC) was developed by identifying key actions that allow the company to change and reconfigure when an opportunity or need arises to keep pace with development (Eisenhardt and Martin, 2000).

Dynamic capabilities have been used as a suitable framework to explain how companies can excel and compete in a turbulent environment, taking into account the evolution and reconfiguration of their operations to remain competitive.Dynamic capabilities (DC) have emerged as one of the most influential theories in management over the past decade (Schilke, 2014). Dynamic capabilities enable companies to integrate, build, reconfigure or shape their resources and competencies in the face of changing business environments (Teece et al., 1997). Dynamic capabilities help maintain evolutionary fitness and allow organizations to overcome inertia (Protogerou et al., 2011; Rowe et al., 2017; Schreyögg and Kliesch-Eberl, 2007;). as well as sensing market and emerging business opportunities and opportunities to seize them (Augier and Teece, 2009; Mikalef and Pateli, 2017). In addition, they can innovate and adapt to changing market conditions (Dixon et al., 2014). In essence, dynamic capabilities can be seen as strategic options that allow companies to renew their current way of working when opportunities arise or need to keep up (Pavlou and El Sawy, 2006). That is, companies may have a chance to achieve competitive returns in the short term, but they cannot maintain competitive returns in the long term due to constant external changes (Teece, 2007).

For example, the main concept used to express the ability of organizations to leverage their investments in information technology towards performance gains was focused on the idea of information technology capability (Bharadwaj, 2000). That is, companies may have good organizational capabilities, but to make a meaningful difference in operational excellence and competitive response, these capabilities must be enhanced by IT flexibility (Rai et al., 2006; El Sawy et al., 2010). Some researchers suggest that rather than developing scarce and non-fungible IT resources, embedding IT in organizational capabilities is the source of significant and sustainable competitive returns (Kohli and Grover, 2008; Rai et al., 2006). In this regard, information technology serves as a means through which new organizational capabilities can be created or existing ones can be improved (Mikalef et al., 2020). Dynamic IT-enabled capabilities are referred to as the ability of a company to leverage IT resources and IT competencies along with other organizational resources and capabilities in order to cope with rapidly changing business environments (Mikalef and Pateli, 2017). 2018). where he found Chen et al., 2017). IT support for core capabilities has a positive impact on corporate strategic flexibility which ultimately leads to performance gains (Limaj et al., (2016).

Flexibility in the concept of dynamic capabilities means the creation or enhancement of dynamic capabilities, which here means capabilities that intentionally create, expand or modify an organization's resource base or normal procedures (Winter, 2003). Hence, the current study relied on the theory of dynamic capabilities by adopting the flexibility of information technology as a dynamic ability that enables the organization to deal more

efficiently with the dynamic environment that is fast moving and changing to achieve competitive advantage.

Developing hypotheses for the study model

In recent years, the rapid development of information technology has led organizations to integrate closely with their supply chain partners, allowing them to efficiently exchange information between supply chain members and improve supply chain efficiency in order to make their supply chain more flexible and efficient. therefore IT flexibility plays an important role in supply chains for the purpose of achieving higher competitive performance IT through in a complex and uncertain supply chain environment (Hou,2020). In today's increasingly competitive global market, many organizations are gradually considering competition, where organizations must provide customers with high-quality products and services while reducing production costs (Lambert and Cooper, 2000). As a result, one of the important issues that has arisen in the organization and operation of organizations is how to use IT flexibility to improve operational efficiency and improve the responsiveness of the supply chain system, thereby improving competitive performance .According to studies (Byrd and Turner, 2001; Kayworth et al., 2001; Wu et al., 2006) concluded that IT infrastructure flexibility is an appropriate competitive weapon by organizations to achieve competitive performance through supply chain capabilities, and that integrating IT infrastructure flexibility can help build stronger supply chain capabilities, including information exchange, coordination, activity integration, and supply chain response. Based on the study (Hou, 2020) that presented a perception of supply chain capabilities, which can be considered

dynamic capabilities, with the exchange of information of its components, coordination, integration of activity, and supply chain response, the supply chain capabilities of the studied organizations show better organizational performance on this basis, we can assume the following:

H1: IT flexibility positively impacts on competitive performance through supply chain capabilities.

H1a: There is a positive indirect impact relationship with significant significance of modularity in competitive performance through supply chain capabilities.

H1b: There is a positive indirect impact relationship of significant Standardization in competitive performance through supply chain capabilities.

H1c: There is a significant indirect positive impact relationship for transparency in competitive performance through supply chain capabilities.

H1d: There is a significant indirect positive impact relationship for scalability in competitive performance through supply chain capabilities.

IT flexibility can support the rapid development and implementation of IT applications. IT can enable organizations to be alert and responsive to changes in the environment. Specifically, flexibility allows interconnected, compliant IT organizations to exchange information along the supply chain and facilitate real-time collaboration with supply chain partners improving organizations' operational flexibility (Lu and Ramamurthy, 2011; Devaraj et al., 2007). A flexibility IT infrastructure enables organizations to share data and process resources across organizations through compliant, connected IT infrastructure and modular (Mikalef et al., 2016). In addition, IT flexibility, transparency, connectivity, and modularity of

information technology enable high coordination among its supply chain partners in product design, production scheduling, and product manufacturing changes (Wang and Wei, 2007). Siau and Tian (2004). noted that there is an urgent need for organizations to be fully aligned with their supply chain partners in IT application software, Hardware and network systems in order to fully realize the potential of the supply chain. In addition, IT flexibility enables entrepreneurs to analyze customer data, develop new products, and quickly enter new markets through scalability (Pavlou and El Sawy, 2006). Accordingly, the following hypothesis can be formulated:

H2 There is a statistically significant positive impact relationship between IT flexibility and supply chain capabilities. A number of sub-hypotheses branch out from it.

H2a: There is a statistically significant positive impact relationship between stereotyping and supply chain capabilities

H2b: There is a statistically significant positive impact relationship between transparency and supply chain capabilities.

H2c: There is a statistically significant positive impact relationship between Standardization and supply chain capabilities.

H2d: There is a statistically significant positive impact relationship between scalability and supply chain capabilities.

Some current studies suggest a positive relationship between supply chain capabilities and the competitive performance of organizations, including (Chen et al., 2009; Kim, 2009). So, according to the theory of dynamic capability, distinctive supply chain capabilities that have been developed, which enable supply chain partners to achieve competitive advantage (Olavarrieta and Ellinger, 1997). Supply chain capabilities enhance the sales volume and market share of participating organizations by

accelerating effective and efficient product delivery to consumers. These capabilities enable supply chain partners to tap into markets that may be inaccessible due to operational and individual distribution constraints (Wu et al., 2006). Supply chain capabilities also enable downstream supply chain partners to respond effectively to customer queries (Gawankar et al., 2016). Thus contributing to operational performance (Ju et al., 2016). Previous research has found a positive correlation between supply chain dynamic capability and competitive operational performance. Based on the concept of dynamic capabilities, supply chain coordination and information sharing contribute to superior operational and competitive performance at the organizational level to competitive advantage (Huo et al., 2014; Ju et al., 2016; Kim et al., 2009). Similarly, the study of Chen et al. (2009) confirms that supply chain capabilities are linked to efficiency focused on reducing cost, which in turn will contribute positively and directly to improved performance. Irfan et al. (2019) also found that supply chain capacities have an impact on information exchange and coordination on response speed, as supply chain response is a vital capability that is achieved through the ways in which supply chain managers change production quantities in response to shifts on both the supply and demand sides. Therefore, the following hypothesis can be formulated:

H3: There is a statistically significant positive impact relationship between supply chain capabilities and competitive performance.

H3a: There is a statistically significant positive impact relationship between information exchange and competitive performance.

H3b: There is a statistically significant positive impact relationship between integration and competitive performance.
H3c: There is a statistically significant positive impact relationship between coordination and competitive performance.
H3d: There is a statistically significant positive impact relationship between supply chain response and competitive performance.

The relationship between IT flexibility and an organization's competitive performance is an important theme that has dominated information systems research over the past two decades (Tanriverdi et al., 2010; Kim et al., 2011). Scientists coined the term IT flexibility in an attempt to measure an organization's efficiency in exploiting its IT assets and resources. According to (Bharadwaj, 2000) the flexibility of information technology is not so much a specific set of technological functions as it is an organization-wide ability to leverage technology to differentiate from competitors, and many studies have tried to understand the role of information technology in enhancing the competitive position of the organization, with a growing body of studies emphasizing the importance of information technology flexibility in transforming IT resources and IT competencies into distinct business value (Kim et al., 2011; Pavlou and El Sawy, 2011). However, IT flexibility has been conceptualized as merely a grouping of IT resources and IT competencies in the vast majority of empirical studies (Wade and Hulland, 2004). Recent comments suggest that rather than attempting to identify the IT resource groups and IT competencies that organizations should target, it is necessary to

identify the organizational capabilities that IT should target for empowerment or enhancement (Kohli and Grover., 2008; Tanriverdi et al., 2010; Kim et al., 2011). Based on this logic, the researcher was interested in examining the flexibility of information technology as dynamic capabilities, hereinafter referred to as dynamic capabilities that support information technology (Tanriverdi et al., 2010). This is with a focus on IT flexibility, which is likely to help organizations differentiate themselves from competitors and drive forward an organization's competitive performance (Wetering et al., 2017). As such, IT flexibility can facilitate a timely response in terms of IT-based competitive actions geared towards sustainable competitive advantage (Overby et al., 2006). Based on this proposition, the following hypothesis was formulated:

H4 There is a statistically significant positive impact relationship between IT flexibility and competitive performance. A number of sub-hypotheses branch out from it:

H4a: There is a statistically significant positive impact relationship between stereotyping and competitive performance.

H4b: There is a statistically significant positive impact relationship between transparency and competitive performance.

H4c: There is a statistically significant positive impact relationship between normative and competitive performance.

H4d: There is a statistically significant positive impact relationship between scalability and competitive performance.

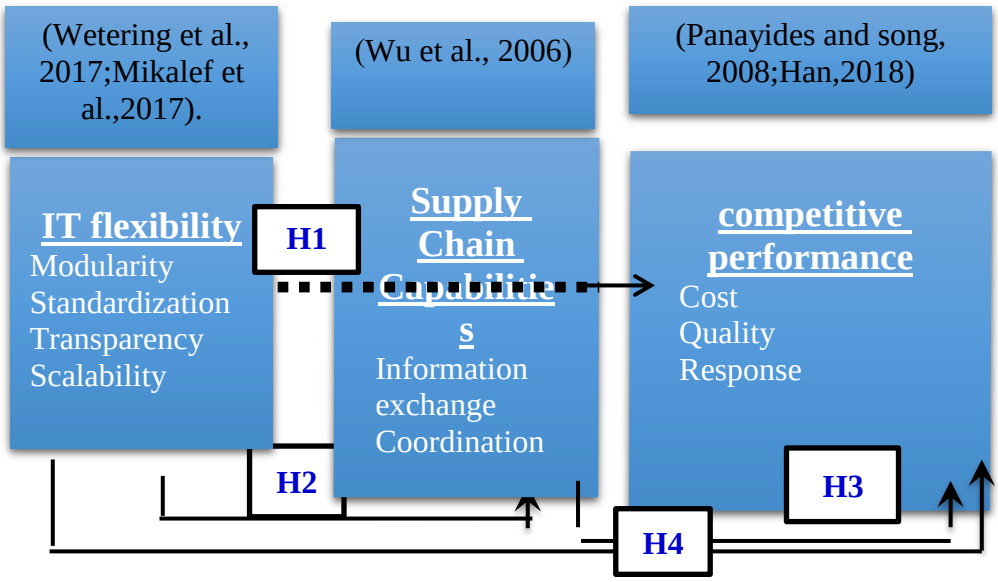

Figure (1): The research model

Methodology

Sample and procedure

Due to the importance of the maritime sector in Iraq, specifically in the province of Basra, this study was conducted in the General Company for Ports of Iraq um Qasr Port. IT flexibility and supply chain capabilities are important for competitive performance. The study population was identified with 7150 employees. according to (Thompson (2002), the acceptable sample size was determined at 365, accordingly, 400 questionnaires were distributed randomly, of which 375 questionnaires were retrieved, of which 368 were valid for analysis. The distribution of questionnaires was conducted during the first quarter of 2022. The sample included 56% (206) males, 162% (162) females. Respondents were selected from a variety

of jobs, including engineers (15%), technicians (55%), and administrators (30%). Respondents ranged in age from 24 to 59 years, with an average age of 36 years, while their education levels are divided as follows: preparatory or diploma (51%) ,bachelor's degree (42%), and higher degree (7%). Responses were obtained on the five-point Likert scale ranging from "1" (strongly disagree) to "5" (strongly agree).

Study measurement

Information Technology Flexibility:

IT Flexibility variable was measured based on (Wetering et al., 2017; Mikalef et al.,2016). Which consists of 4 dimensions (modularity, transparency, standardization and scalability), consisting of 20 paragraphs.

Supply Chain Capabilities:

Supply Chain Capabilities variable was measured based on (Wu et al., 2006), which consists of 4 dimensions (information exchange, activity integration, coordination, supply chain response), consisting of 19 paragraphs.

Competitive performance:

Competitive performance variable was measured based on (Panayides and song, 2008; Han,2018),). Which consists of three dimensions (cost, quality and response) and consists of 11 paragraphs.

Data analysis results:

Verification of validity and reliability

Because measuring the opinions of individuals is a complex process that requires strict mechanisms, the process of verifying the validity and stability of the scales is a necessary process in

every study that simulates human opinions. Validity refers to the extent to which the measure accurately represents the concept it is designed for. We will verify the validity by verifying the validity of the convergent validity, which in turn refers to the degree of convergence of the elements of the structure of the measure that measures a certain concept in an acceptable manner (Hair et al., 2017). Reliability refers to the extent to which the same results were achieved using the same scale at another time. We will rely on the [Confirmatory Factor Analysis-CFA] for the purpose of checking the validity and reliability. This test contributes to verifying the validity of the scale and the stability of the scales in measuring the concepts it was designed for, with the aim of trusting the accuracy of the results of descriptive and inferential statistics (Singh, 2007).

The validity will be verified through two values: (1): The factor loading saturation values of the questions on their dimensions, which should not be less than (0.50) or less than (0.70) in the best cases. (2): Average Variance Extracted (AVE), whose value should be higher than (0.50) (Hair et al., 2010). On the other hand, reliability will be verified based on the two values of Composite Reliability [CR] and the value of Cronbach's [α], to achieve the appropriate stability (Hair et al., 2017). Depending on [Amos.V.24] and [SPSS.V.24] the above values were extracted. The CFA test was conducted to verify the validity and reliability by creating "latent variables" or unmeasured variables, each of which represents a dimension of the variable, and then the questions (in the form of measured variables) are loaded in each dimension on the latent variable. which he represents (Singh, 2007). In order for the procedure to take place, the sample must exceed 200 responses (Kline, 2011), and this matter

was achieved in the current study.

Table (1) shows the results of validity and reliability for the three variables:

Table 1: The results of the validity and reliability

Factors	Items	Factor loading	AVE	CR	A	Factors	Items	Factor loading	AVE	CR	A
Modularity	Q1	0.722	0.500	0.709	0.812	**Information exchange**	Q21	0.648	0.511	0.721	0.824
	Q2	0.717					Q22	0.742			
	Q3	0.779					Q23	0.734			
	Q4	0.633					Q24	0.732			
	Q5	0.661				**Integration**	Q30	0.700	0.576	0.797	0.881
	~~Q6~~	~~0.375~~					Q31	0.792			
Standardization	Q7	0.691	0.545	0.766	0.852		Q32	0.787			
	Q8	0.781					Q33	0.749			
	Q9	0.814					Q34	0.764			
	Q10	0.670				**Supply Chain Response**	Q35	0.794	0.596	0.815	0.892
	Q11	0.726					Q36	0.785			
Transparency	Q12	0.722	0.557	0.778	0.902		Q37	0.785			
	Q13	0.795					Q38	0.786			
	Q14	0.810					Q39	0.707			

	Q15	0.763				**Cost**	Q40	0.712	0.601	0.783	0.818
	Q16	0.629					Q41	0.735			
Scalability	Q17	0.747	0.508	0.700	0.752		Q42	0.852			
	Q18	0.682					Q43	0.794			
	Q19	0.723				**Quality**	Q44	0.780	0.613	0.744	0.805
	Q20	0.697					Q45	0.785			
Coordination	Q25	0.709	0.501	0.715	0.885		Q46	0.783			
	Q26	0.767				**Response**	Q47	0.811	0.570	0.751	0.861
	Q27	0.624					Q48	0.719			
	Q28	0.688					Q49	0.796			
	Q29	0.742					Q50	0.687			

SPSS results Amos &: Source

Through the values shown in the table, it is clear to us that all the standard factors values for the independent variable (information technology flexibility) and its four dimensions have achieved acceptable values for all questions except for question (Q6) of the standard dimension. This question was excluded from this scale in subsequent tests. Also, all the standard factors values for the mediating variable (supply chain capabilities) and its four dimensions achieved the accepted values for all questions. In addition, all standard factors values for the dependent variable (competitive performance) and its three dimensions achieved acceptable values for all questions. On the other hand, the AVE values for all eleven dimensions of the three main variables have

exceeded the accepted value, i.e. the (0.50), and this indicates that the validity of all three dimensions and variables has been achieved in a statistically acceptable manner. Finally, the values of the [CR] and Cronbach's alpha exceeded (0.70), which indicates that the stability of the three measures used in this study has been achieved.

Indicators of model-fit

After the validity of the questions and sub-dimensions has been confirmed, there is a need to identify the validity of the three measures in general, i.e. the quality of the model fit of the data with the supposed models of those measures. CFA also provides a number of indicators that contribute to validating the supposed structure of constructing measures derived from ready-made and previously used measures. This is done based on the assumption of congruence and fit between the covariance matrix of the variables included in the analysis and the matrix assumed by the model. For this purpose, two categories of indicators were relied upon, on the basis of which the model is accepted or rejected, namely: (Widaman & Thompson, 2003). First: absolute fit indices (non-relative): which show the following indices (Chi square (X2)/df and Root mean square error of approximation-RMSEA) in order to identify the general agreement between the theoretical model and the data. It is preferable that the value of (X2/df) be less than (2), and the value of the RMSEA ranges between (0.02) and (0.08). Second: incremental fit indices (relative): which show the following indicators: Goodness-of-fit index-GFI, Comparative fit index-CFI, and Tucker-Lewis Index-TLI. This is to compare the tested model with the null model. It is preferred that these three indicators exceed the value of (0.90). Table (2) shows the results of the indicators:

Table 2: Indicators of the quality of agreement for the three variables of the study

	X/df	RMSEA	GFI	CFI	TLI
IT flexibility	1.89	0.074	0.911	0.921	0.913
Supply Chain Capabilities	1.99	0.079	0.902	0.916	0.902
Competitive performance	1.98	0.069	0.938	0.968	0.957

Through the results shown in the table above, it is clear to us that all indicators have achieved an acceptable and good quality of conformity. Therefore, this ultimately indicates the validity of the scales in their overall form, which can be highly relied upon in extracting and generalizing the results of descriptive and inferential statistics.

Descriptive statistics and correlation

Table (3) presents the descriptive statistics and the relationship between the variables. The results indicated that the mean of the variables was at an middle level for the variables, which ranged between (3.228-3.305). The table also showed that the standard deviation of the variables were slight differences between the opinions of the respondents. The results also indicated that there are positive correlations between the three variables at the level of significance (0.05), and this supports the hypotheses of the current study.

Table 3: Descriptive statistics and correlation

	Mean	S.D	Modularity	Standardization	Transparency	Scalability	IT flexibility	Supply Chain Capabilities	Competitive performance
Modularity	3.294	0.804	1						
Standardization	3.242	0.903	.699**	1					
Transparency	3.274	0.889	.615**	.700**	1				
Scalability	3.305	0.848	.535**	.648**	.625**	1			
IT flexibility	3.280	0.729	.665**	.695**	.675**	.646**	1		
Supply Chain Capabilities	3.278	0.722	.555**	.609**	.624**	.639**	.607**	1	
Competitive performance	3.228	0.797	.444**	.662**	.616**	.601**	.690**	.640**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Hypothesis testing

The process of hypothesis testing is the verification of the validity of the prevailing or disputed assumptions or facts in the previous literature. The current study model includes one independent variable (information technology flexibility), one intermediate variable (supply chain capabilities), and one dependent variable (competitive performance). On this basis, the Path Analysis provided by Amos software was adopted. v. 24, for its accurate ability to extract and test direct and indirect relationships in a unified model. In the path analysis, the Estimate value represents the estimated effect value corresponding to the β value shown by the regression analysis, while the S.E. The standard error of the assumed relationship, and the critical ratio (C.R.) corresponds to the value of (t) shown by the regression analysis, through which the acceptance or rejection of the hypothesis is determined. It must exceed ±1.96 for the hypothesis to be accepted. Finally, the value of (P) indicates to the statistical significance or acceptable moral error that determines the acceptance or rejection of the hypothesis as well. It should not exceed 0.05 for the hypothesis to be accepted. In this context, and by relying on the Amos program, a model was drawn to test the main hypotheses and another model to test the sub-hypotheses. With regard to the indirect effects, the statistical mechanism (Bootstraping) provided by the Amos program was relied upon to extract estimated effect values, standard errors, and critical ratios to accept the indirect effect hypotheses. Table (4) shows the results of testing the main hypotheses, while Table (5) shows the results of testing the sub-hypotheses, as follows:

Table 4. Hypothesis testing

Hypothesis		Estimate β	S.E.	C.R. t-value	P	Results
H1	IT flexibility → competitive performance	0.265	0.085	3.409	***	supported
H2	IT flexibility → supply chain capabilities	0.807	0.041	19.545	***	supported
H3	supply chain capabilities → competitive performance	0.526	0.086	6.776	***	supported
H4 Indirect	IT flexibility → supply chain capabilities → competitive performance	0.425	0.065	6.187	***	supported

Through what the table 4 show, it is clear that the first hypothesis was accepted, which indicates the existence of a direct positive influence relationship with significant significance for the flexibility of information technology in competitive performance at a significant level ($p < 0.01$). The second hypothesis was also accepted, which indicates that there is a direct positive impact relationship with significant significance for the flexibility of information technology in the capabilities of the supply chain at a significant level ($p < 0.01$). Also, the third hypothesis was accepted, which indicates that there is a significant direct positive effect relationship of supply chain capabilities in competitive performance at a significant level ($p < 0.01$). Finally, the fourth hypothesis was accepted, which indicates that there is a significant indirect positive influence relationship for the flexibility of information technology in competitive performance through supply chain capabilities at a significant level ($p < 0.01$). The mediating role of the supply chain capabilities was partly (Partial Mediating) in order to accept the first hypothesis.

Table 5. Sub-hypothesis testing

Hypothesis				Estimate β	S.E.	C.R. t-value	P	Results
H1a	Modularity	→	competitive performance	-0.052	0.058	-0.894	0.371	not supported
H1b	Standardization	→		0.272	0.067	3.604	***	supported
H1c	Transparency	→		0.077	0.066	1.045	0.296	not supported
H1d	Scalability	→		-0.006	0.069	-0.078	0.938	not supported
H2a	Modularity	→	supply chain capabilities	0.123	0.047	2.36	0.018	supported
H2b	Standardization	→		0.191	0.053	2.856	0.004	supported
H2c	Transparency	→		0.273	0.052	4.291	***	supported
H2d	Scalability	→		0.359	0.052	5.826	***	supported
H3	supply chain capabilities	→	competitive performance	0.525	0.086	6.755	***	supported
H4a Indirect	Modularity →	supply chain capabilities →		0.065	0.029	2.207	0.010	supported
H4b Indirect	Standardization →			0.100	0.037	2.378	0.008	supported
H4c Indirect	Transparency →			0.143	0.041	3.122	***	supported
H4d Indirect	Scalability →			0.188	0.042	4.214	***	supported

Through what the table 5 shows, we can see the rejection of hypothesis H1a, which indicates that there is no direct positive influence relationship with significant significance for modularity on competitive performance. While the H1b hypothesis was accepted, which indicates that there is no direct positive effect relationship with significant significance for standardization on competitive performance. The H1c hypothesis, which indicates that there is no direct positive effect relationship with significant significance for transparency on competitive performance, was also rejected. Also, the H1d hypothesis, which indicates that there is no direct positive effect relationship with significant significance for scalability on competitive performance, was rejected. As for the sub-hypotheses of the second hypothesis, the results indicate the acceptance of all four sub-hypotheses. therefore, the existence of a direct positive impact relationship with significant significance for modularity, standardization, transparency, and scalability on capabilities of the supply chain. As for the sub-hypotheses of the fourth hypothesis, the results indicate the acceptance of all four sub-hypotheses, and therefore, the existence of a direct positive impact relationship with significant significance for modularity, standardization, transparency, and scalability on competitive performance through supply chain capabilities.

Discussion

The purpose of this study was to identify the impact of IT flexibility on competitive performance through supply chain capabilities, and to identify the importance and role of the intermediary of capabilities. The current study is in line with

many attempts by previous studies in different models and contexts, for example (Mikalef et al., 2016; Han, 2017; Han, 2018; Hou, 2020). The results of this study confirm the important impact of IT flexibility on competitive performance through supply chain capabilities. In the next sections we will discuss the implications of theory and practice, as well as propose a number of future directions for research.

Theoretical implications

The current study used the dynamic capability(DC) to explore the relationship between IT flexibility on the one hand and organizational performance, with supply chain capabilities as an mediating variable for information technology, it was found that there are no significant and direct effects on competitive performance, but they have an indirect impact on organizational performance through supply chain capabilities. Therefore, this study indicates That the impact of information technology on competitive performance (Barney et al., 2001) that competitive performance gains are the result of IT resources and IT competencies per se. The perspective adopted in this study highlights the importance of strategically leveraging IT flexibility in core areas. Previous studies have confirmed that such an approach is more applicable because it is important to first understand the areas in which IT should be instilled, and then work again to figure out the particular mix of IT resources and IT capabilities to embrace the flexibility that can build such an IT potential capability (Kim et al., 2011). Our hypothesis posits that flexible IT architectures provide the necessary platform from which digital choices can be enacted (Sambamurthy et al., 2003). The results of statistical analysis confirmed this hypothesis, which proves that resilient IT infrastructures have commercial

value, however, their impact cannot be directly linked to competitive performance.

Practical implications and Recommendations

By discussing the findings, we can propose a number of guiding points that are important. First, This study recommends the need to pay attention to the capabilities of the supply chain, and develop them whenever possible. Despite the importance of (ITF) in competitive performance. The organizations must be able to know the reason behind this relationship. Second, The role of information technology flexibility and its positive impact is clearly visible. Its impact extends through the empowerment that it can receive through supply chain capabilities, which is ultimately reflected in improving the overall performance of ports. Its reflections are shown through flexibility, speed of response, coordination, integration of activity ,the availability of the ability to transfer and exchange information, thus close cooperation, coordination, integration of all supply chain partners in information technology so that they can benefit from their full advantages in investing in information technology. In the interest of achieving the organization's most important goal, which is to achieve competitive performance. The need for the participation and adoption of organizations, especially maritime organizations, including supply chain capabilities and their optimal exploitation, because the port represents the most important and intermediate links of global supply chains. Supply chain capabilities play an

important role in logistics operations through the exchange of information between organizations, supply chain parties and special coordination, integration and response processes for the supply chain, enabling it to deal more in line with the dynamic competitive environment. Adopting supply chain capabilities to give organizations the ability to maintain their competitive advantages Finally, the study suggests that providing the appropriate climate for building, and preparing flexible technology enables organizations to ensure the flow of information and resources smoothly inside and outside the organization. Thus the organization can reach competitive performance, and this is what the researcher reached in this study as the presence of traditional information technology within organizations can be easily imitated by other organizations. Thus the difficulty of competition in an environment current Business. Therefore, the study recommends port administrations to adopt the flexibility of information technology in its dimensions (modular, transparency, standardization, and scalability). Successful organizations are those that invest in information technology without starting from scratch and exchange information and knowledge transfer, and high transparency with their partners, which makes them able to adapt to environmental changes and respond to them by creating the climate recommended by the researcher above to facilitate operations,

and give a kind of complexity to competing organizations that try to imitate the strategy and operations of the organization.

Limitation & future directions of research

Despite the results obtained, there are a number of limitations that should be discussed and recommended to be addressed in future studies. The current study has a cross-sectional design based on aggregating data into a single point, so the results will lose their causal nature, as well as the risk of potential bias in responses. This is because the data were collected from one source and at one time and most studies of this type may be subject to bias. Therefore, we recommend that future research focus on the possibility of longitudinal studies that extract causal relationships between variables more accurately. In addition, the study model is limited to only three variables, we suggest that future studies test other variables, for example: environmental dynamics or organizational culture. Finally, the results of the current study were extracted from the maritime sector, specifically the General Company for Ports of Iraq, so caution should be exercised about generalizing the results, therefore, we suggest that such studies be applied in other sectors, such as the service sector or the educational or commercial sector.

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