The Relationship Between Information Technology Capabilities, Organizational Intelligence, and Competitive Advantage

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Abstract
This study aimed to identify the mediating role of organizational intelligence between information technology capabilities and competitive advantage. The data were collected from a sample of 224 employees of various managerial positions in e-commerce companies in Jordan. Process macro v3.5 was applied to process data collected. The study concluded that information technology capabilities and organizational intelligence play an essential role in raising and improving competitive advantage and responding to business environmental changes. Empirical evidence indicated a need to develop information technology capabilities via organizational intelligence due to its positive impact on competitive advantage.

Keywords
competitive advantage, e-commerce companies, information technology capabilities, organizational intelligence

Introduction
In today’s critical work environment, organizations must be more intelligent and adapt to radical changes, neutralizing threats and exploiting market opportunities (Hadj et al., 2020). The rapidly changing business environment pressurizes companies to put in more effort to survive (Huang et al., 2012; Tarańdar & Gordon, 2005). Ochera et al. (2018) argued that avoiding environmental risks depends on improving enterprises’ internal resources periodically. Companies need to be more responsive in creating new knowledge in a rapidly changing environment, which has led to a reliance on IT under certain environmental conditions (Chu et al., 2019; Lu & Ramamurthy, 2011; Wade & Hulland, 2004). There has long been a debate on IT’s impact on firm performance (e.g., Castro & McLaughlin, 1999; Lu & Ramamurthy, 2006). The consensus is that IT can lead individual firms to competitive advantage and that value creation might be manifested in different ways, strictly depending on the firm’s organizational and environmental context (Galliers et al., 2020; Sambamurthy et al., 2012).

IT capabilities are critical for a firm to realize business value and sustain a competitive advantage (Bharadwaj, 2000). Previous studies have examined how firm-wide IT leads to competitive advantage, which revealed that in a volatile business environment, IT helps to manage extreme changes and exceptional sustainability threats and get the advantage of new business opportunities (Bhatt & Grover, 2005). On the other hand, Fichman (2004) suggests that IT’s role is to drive and lead business strategy formulation to achieve growth and create and sustain competitive advantage. IT capabilities and IT leadership within the industry take place as antecedents to industry leadership (Dańa et al., 2020).

IT capabilities have been developed and widely adopted by many companies to collect, process, store, and retrieve information (Basheer et al., 2016; Galliers et al., 2020). Accordingly, IT has increased companies’ ability to exploit opportunities and avoid threats. IT also identifies the business strategy’s strengths and weaknesses (Chu et al., 2019). Therefore, installing IT into the businesses helps to understand what is happening in the external environment, and it defines how to process the incoming data for predicting the external environmental factors (Lu & Ramamurthy, 2011).

Organizational intelligence is an ideal way to utilize the collected information and process effectively using IT, which can adapt to the external environment, commensurate with its resourcefulness and vision, which manifests organizational intelligence (Ismail & Al-Assa’ad, 2020). In addition, competitive advantage is a quality that a business can achieve over its competitors, which can be gained by offering customers a better value (Diab, 2014; Hadj et al., 2020).

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Moreover, competitive advantage tends to lead to brand loyalty as customers prefer better value products and services (Attaran & Deb, 2018; Fonseca & Domingues, 2017).

Past theories fall short in explaining the relationship between IT capabilities and organizational intelligence in the modern work environment (e.g., the study of Neirotti & Raguseo, 2017; Sambamurthy et al., 2012; Yaghoubi et al., 2011). Lu and Ramamurthy (2011) recommend more empirical studies on the relationship between IT capabilities and organizational agility and its role in increasing the competitive advantage.

In light of the above background, this study investigated the main research question stated as “Does organizational intelligence play a mediating role between IT capabilities and competitive advantage in business organizations?”

Thus, this research attempts to explain the relationship between IT capabilities, organizational intelligence, and competitive advantage in modern work environments. It develops on the premise that IT capabilities and organizational intelligence are critical in effectively deploying and managing IT resources for a more significant competitive advantage.

**Literature Review**

**IT Capabilities**

IT capabilities are the abilities of the organization to implement a set of common platforms (e.g., physical components, networks, database, software, and social skills) and to determine to what extent the organization is good at managing this set of common platforms (Lu & Ramamurthy, 2011). Besides, it identifies the strengths and weaknesses of the business strategy. Therefore, enabling IT into businesses addresses the sense of what is happening in the external environment, and it defines how to process the incoming data for improving the external environment (Chu et al., 2019).

IT capabilities as a concept comprise three dimensions: infrastructure, a business spanning, and proactive stance. IT infrastructure represents the organization’s ability to deploy hardware platforms and related software systems (Lu & Ramamurthy, 2006). Furthermore, IT business spanning demonstrates an organization’s ability to support business goals effectively through IT resources, whereas IT proactive stance focuses on how the organization proactively uses existing resources of IT to create new business opportunities (Chu et al., 2019).

IT infrastructure includes IT materials (e.g., hardware, software, and networks) built through systems, which provides a technical basis for product implementation based on IT and process innovation (Basheer et al., 2016; Lu & Ramamurthy, 2011). The study of Huang et al. (2012) shed light on IT capability and its ability to acquire, publish, collect, and recycle IT resources to support and promote business strategies and work procedures.

Business spanning is the company’s management’s ability to take new ideas and use the resources to support IT and promote business objectives. Furthermore, the extent to which the company’s vision for developing IT strategy and the integration of IT, business, and strategic planning enables the company’s management to understand IT value (Basheer et al., 2016; Lu & Ramamurthy, 2011). A proactive stance represents the company’s ability to work in the field of exploration, search for IT solutions and innovations, and find new ways to enhance the use of IT and its immediate impact (Basheer et al., 2016; Lu & Ramamurthy, 2011).

**Organizational Intelligence**

Organizational intelligence is the comprehensive management of the business as well as the intelligence of establishing policies. It reflects ways of mutual reinforcement to receive implicit and explicit knowledge and increases the organization’s general interaction to achieve specific results at specific times (Neirotti & Raguseo, 2017). Organizational intelligence is the organization’s ability to mobilize all its available mental forces and focus on the mind’s ability to achieve business objectives (Thannhuber et al., 2017). IT and organizational intelligence are vital to prepare the organization for creating modern organizations that the researcher refers to as having their organizers’ memory (Che et al., 2015). IT impacts employees in smart companies where employees are considered the origins of smart organizations, and IT works to achieve organizational intelligence (Azma et al., 2012; Daňa et al., 2020). Precedents can include reasonable organizational structures, expert managers, products, and processes appropriate to the work environment’s requirements, coherent tasks, a clear mission, essence values, and roles that define employees’ rights and performance. In each dimension, it can identify different antecedents that could contribute to more significant causal factors of the organizational intelligence elements that enable managers to evaluate their organization in a right manner through seven dimensions, which are strategic vision, shared fate, appetite for change, heart, alignment and congruence, knowledge deployment, and performance pressure (Albercht, 2005; Ismail & Al-Assa’ad, 2020).

Strategic vision represents the need of the strategic organization for theory, concept, or a principle. In other words, it is the answer to the organization’s leader’s questions. For example, who we are, why we exist, the initial value within, why the world is accepting, valuing things, and rewarding (Hamad, 2019). The leadership of strategic management is the ability to shape and develop a vision, and this means developing a strategic vision for IT that seeks to find ways to embrace new technology that contributes to the development and strengthening of IT Infrastructure (Galliers et al., 2020).

Shared fate is the association of most people, including parties with interests (e.g., suppliers and business partners) with the organization. This feeling stems from everyone’s
awareness that they are in one compound. They create their strength with their collective sense and teamwork (Ismail & Al-Assa’ad, 2020). The origin of the concept of common destiny dates back to World War I and II. In general, this term’s purpose was to achieve common destiny to eliminate the ethnic disparities between individuals in society in all fields and which was then applied in organizations to raise the level of lower-income classes in our present time (Chen & Siau, 2012).

Appetite for change is a concept that defines change as a challenge, an opportunity for new and existing experiences and practices, or an opportunity for radical change. Individuals in these environments see the need to reinvent as a business model and simulate challenges and embrace them, and the organizations need different types of changes in the organization’s strategic vision (Ismail & Al-Assa’ad, 2020). The desire for change in smart organizations represents the enormous potential of organizations to change the internal environment in line with accelerating external environmental developments by adapting the organizational culture of the organization, by stimulating processes to engage minds and patience to meet challenges and experiment with new experiences (Nasabi & Safarpour, 2009).

According to an organizational psychologist’s definition of heart, it is the effort used to assess one’s energy as members of the organization to contribute across and above the interdependence and relationship levels to make that estimate. Alignment and congruence explain setting rules for the group of individuals’ operations as they will begin to clash and overlap. Designers and leaders work to remove the structural contradictions of intrinsic value, promote the adaptation of one’s energy, and harness them to a common purpose (Nasabi & Safarpour, 2009). Some define alignment and congruence as controlling differences and disparities between different measures, procedures, methods, specifications, and systems and making them compatible and designed to avoid duplication of work efforts (Balouei & Ghasemian, 2014).

Knowledge deployment explains that organizational intelligence should ensure a free flow of knowledge through different cultures, taking care to strike a balance between a conversation about the sensitivity of new information and innovations and dealing with an open mind with questions that require attention (Hamad, 2019). At the end of the birth of the cosmic mind or the global mind, whose first evolutionary steps take place along the development of the global economy, which will meet the human knowledge system of the birth of the cosmic mind (Ismail & Al-Assa’ad, 2020). Performance pressure is the belief that the employees have for more work and a sense of what they need to accomplish. Leaders promote and support a sense of employees’ belief in more work, but this only impacts when all organization members accept and view it as a translation and response to their set of expectations and core processes of shared success (Daña et al., 2020).

**Competitive Advantage**

Porter and Kramer (2002) described the competitive advantage as a property that a business can have over its competitors; one can gain competitive by offering customers better and higher value than competitors. Hadj et al. (2020) conceptualize competitive advantage as the target market’s favorite unique products or services which is the reason behind brand loyalty. Competitive advantage is the ability of a company to outperform competitors within the same industry. It attracts customers, builds prestige for the organization or its products, and increases perceived customer value and satisfaction (Acquaah & Yasai-Ardekani, 2008).

This study on competitive advantage lists two dimensions: exploiting market opportunities and neutralizing threats (Sigalas, 2015). This process seems sufficient because it provides a clear and practical measure of competitive advantage that can raise the executive’s awareness of the conceptual nature and fundamental expressions of competitive advantage (Hadj et al., 2020).

The exploiting market opportunities take three different ways (e.g., the development of all exploiting market opportunities, the full development of exploiting market opportunities, and more development of exploiting market opportunities than its competitors). Also, neutralizing threats takes three possibilities (e.g., neutralizing all threats existing on the market, fully neutralizing the competitive neutralizing threats and, neutralizing threats more effectively than its competitors) (Hadj et al., 2020).

**Hypothesis Setting**

The conceptual model used in this study is adapted from the literature review carried out. The model puts forward that organizational intelligence plays a mediating role between IT capabilities and competitive advantage.

**Theoretical Linkages and Hypothesis Development**

**Relationship Between IT Capabilities and Organizational Intelligence**

There is a strong relation between IT capabilities and its agility in improving capabilities, leading to competitive advantage (Lu & Ramamurthy, 2011). The resulting research by Azma et al. (2012) shows that a good relationship in IT is an application to modify, apply knowledge, and a common perspective. The ability of IT emphasizes the superiority of business-based IT business in partnership and synergy. The partnership and synergy between IT and business managers lead to IT work’s effectiveness in everyday decision-making, more strategic applications, and greater stakeholder participation, thus producing better implementation (Weill et al., 2002).
Intellectual formation plays a significant role in finding common destiny, which is defined as the same sense of belonging, with the same desire, with the same enthusiasm, and with the same hope that the status quo in the organizations will contribute to changing that situation and it means that IT contributes to expansion and expansion through greater participation of stakeholders and a joint decision to better implement (Bhatt & Grover, 2005). Technological advancement has decreased the amount of time required to communicate with even the most distant parts of the globe but, this technological progress advancements in communication and computers are of limited value if not accompanied by corresponding progress in techniques of command, control, and intelligence (Daňa et al., 2020; Weill et al., 2002). Accordingly, it was hypothesized as follows:

**Hypothesis 1:** IT capabilities positively affect organizational intelligence.

**Relationship Between Organizational Intelligence and Competitive Advantage**

The collective commitment represents the strong internal desire of individuals to work at the collective level, to exert the utmost effort in work stemming from the belief in the goals and values of the organization, and the desire to maintain membership in the company in their belief in sustainability and provide more than what they have to perform (Hamad, 2019; Yaghoubi et al., 2011). The change represents a challenge and a new exciting opportunity for expertise to address something new in society, and these environments see a need to reinvent a business model as a new and stimulating challenge (Nasabi & Safarpour, 2009). The study of Che et al. (2015) supports a relationship between organizational intelligence and competitive acquisition advantage in response to environmental changes. Several studies mention the relationship between competitive advantage and organizational intelligence to achieve better business performance (Azma et al., 2012; Che et al., 2015). Accordingly, it was hypothesized as follows:

**Hypothesis 2a:** Organizational intelligence positively affects exploiting market opportunities.

**Hypothesis 2b:** Organizational intelligence positively affects neutralizing threats.

**Relationship Between IT Capabilities and Competitive Advantage**

In a market environment, competitive organizations need emerging digital technologies (e.g., the internet and computing technology of cloud), thus gaining competitive advantage sustainability (Niemand et al., 2020). IT capabilities can help organizations integrate internal and external resources to provide a digital resource base to manage and coordinate the innovation process, thus ensuring innovation activities between organizations (Neirotti & Raguseo, 2017). A study by Galliers et al. (2020) illustrated the relationship between IT capability and competitive advantage and asset specificity to get strategic flexibility to improve corporate ability to increase neutralizing threats strategies.

Technology changes the competition rules, and many of today’s significant firms grew out of technological changes that they could exploit (Porter & Kramer, 2002). Companies
are already developing innovations to create new opportunities (Lu & Ramamurthy, 2011). All companies need to have IT capabilities to predict unprecedented and unpredictable external conditions (Neirotti & Raguseo, 2017). Hence, IT capabilities are essential for companies to achieve business value and maintain a competitive advantage (Bhatt & Grover, 2005).

Contemporary studies (e.g., Galliers et al., 2020) have called for a need to understand the routines and processes through which IT capabilities help organizations innovate and create competitive advantage. However, IT is a competitive advantage that faces imitation by competitors and other companies (Bhatt & Grover, 2005). Understanding how this happens would have important implications for developing and leveraging relevant IT capabilities (Galliers et al., 2020). As results Wong and Yung (2005) demonstrated the establishment and expansion of the infrastructure behind IT capabilities; concerned by the institution are one of the most critical factors that affect the maintenance of the competitive advantage of the company in the era of modernity and technological progress, to open other doors for its suppliers and customers to more knowledge and communication. At present, great importance is given to IT capabilities, where IT is subjected to many imitation and reproduction by competitors and other companies (Chen & Siau, 2012). Accordingly, it was hypothesized as follows:

**Hypothesis 3a:** IT capabilities positively affect exploiting market opportunities.

**Hypothesis 3b:** IT capabilities positively affect neutralizing threats.

**Mediating Role of Organizational Intelligence Between IT Capabilities and Competitive Advantage**

Organizational intelligence affects business capability for competing in current business environments (Che et al., 2015). Also, counterparty studies have found that IT improves organizational agility and competitive advantage strategy to be sustained (e.g., Neirotti & Raguseo, 2017). Employees believe in more work to feel what they need to accomplish and faithfully believe in their goals, contributing to the close interaction and collaboration between IT, business, and trust (Ismail & Al-Assa’ad, 2020).

There is increasing usage of organizational intelligence for better decision making in several industries. Organizational agility is the ability to sense and respond to market opportunities and threats that affect competitive performance and IT infrastructure flexibility; hence, people now can access storage and transfer information (Chen & Siau, 2012). It means that the dissemination of knowledge contributes to the exploitation of resources to support IT and promote business objectives and gain knowledge to exploit IT’s existing resources and create new jobs (Azma et al., 2012). IT has affected changes in organizations and improved organizational intelligence and personal experience in firms in many ways. The study of Niemand et al. (2020) demonstrated the impact of IT capabilities in the relationship between IT expansion and business performance and strategic vision in the long term.

IT’s ability is critical for the company to achieve business value and maintain competitive advantage, although research has begun to reach its IT capabilities for competition by the operation of organizational agility (Lu & Ramamurthy, 2011). IT helps a company to get a competitive advantage (Balouei & Ghasemian, 2014). Organizations must enhance a strategy through the employees, suppliers, and so on to predict in dealing with predictable and unpredictable actions. Furthermore, improve IT capabilities because it is the most crucial issue in enhancing organizational performance (Ismail & Al-Assa’ad, 2020). Accordingly, it was hypothesized as follows:

**Hypothesis 4a:** Organizational intelligence has a mediating role between IT capabilities and exploiting market opportunities.

**Hypothesis 4b:** Organizational intelligence has a mediating role between IT capabilities and neutralizing threats.

**Method**

**Participants**

The study’s population consisted of employees at e-commerce companies from Jordan from different positions such as top management, middle management, supervisors, and others. The sample size comprised 224 employees who represented 40.7% of a total population of around 550 managerial employees from different levels using data collected from employees in 13 firms at e-commerce companies in Jordan utilizing self-administered questionnaires. Convenience sampling techniques were used. Malhotra (1999) suggested that the sample size should be above 150 and, more ideally, around 200 to 300 respondents.

**Measures**

The empirical data were collected from a questionnaire developed on previous studies (e.g., Chu et al., 2019; Hadj et al., 2020; Ismail & Al-Assa’ad, 2020). The questionnaire consisted of four sections: the first section explained demographic details of the applicants, the second section listed the attitude statements of IT capability dimensions, the third listed the attitude statements of organizational intelligence dimensions, and the fourth section listed the attitude statements of competitive advantage dimensions. The participants in the sample judged the attitude statements on a 5-point Likert-type scale, where “1” was I fully disagree, “2” I disagree, “3” I neither agree nor disagree, “4” I agree, and “5” I fully agree.
The study used three main dimensions for IT capabilities: infrastructure, business spanning, and proactive stance. Among these dimensions, IT infrastructure ability confirms the organization’s ability to deploy hardware platforms and related software systems. IT business spanning ability demonstrates an organization’s ability to support business goals effectively through IT resources. IT proactive stance focuses on how the organizations proactively use IT’s existing resources to create new business opportunities (Chu et al., 2019; Lu & Ramamurthy, 2011). The organizational intelligence used seven main dimensions: strategic vision, shared fate, appetite for change, heart, alignment and congruence, knowledge deployment, and performance pressure (Che et al., 2015; Ismail & Al-Assa’ad, 2020).

Finally, the study measured the competitive advantage by using two main dimensions: exploiting market opportunities and neutralizing threats (Sigalas, 2015). The exploiting market opportunities can take three different paths (e.g., the development of all exploiting market opportunities; full development of exploiting market opportunities; and more development of exploiting market opportunities than its competitors). Neutralizing threats also take three possibilities (e.g., neutralizing all threats existing on the market, fully neutralizing the competitive neutralizing threats, and neutralizing threats more effectively than its competitors) (Hadj et al., 2020).

Design

This study is descriptive and correlational in design as it describes the variables affecting the main problem and the correlations between them (Sekaran & Bougie, 2016). It used a survey method with minimum interference at the natural workplace of the participants. Data were collected once with each participant. The study, therefore, was classified as cross-sectional, with the individual as the unit of measurement (Hanafi & Fadilah, 2017).

A pilot study (i.e., pre-tested) was collected from 25 employees to ensure if the respondents clearly understood the questions.

Statistical Analysis

The study used the “IBM SPSS 25” statistical package to portray the participants’ demographic findings and presented summary statistical averages, normality, reliability, and validity tests. Moreover, it used a multilinear correlation test to examine the relationships between variables. Then multilinear regression analysis helped to examine the study’s hypotheses. Finally, it examined the mediating tests using PROCESS v3.5 by Andrew F. Haye with SPSS statistics to determine the extent of its impact and contribution to improving the relationship between the study variables.

Results

Demographic Findings

The results have shown that the general characteristics of the participants were as follows: 141 male (63%), 83 female (37%); full-time employees in a company: below 20 employees, 41 (18.3%); 20 to 50 employees, 56 (25.0%); 51 to 100 employees, 82 (36.6%); and over 100 employees, 45 (20.1%); organizations years in business: below 5 years, 100 (44.6%); 5 to 10 years, 86 (38.4%); 11 to 20 years, 36 (16.1%); and over 20 years, 2 (.9%); years of e-commerce company products consumed: less than 5 years, 18 (8.0%); 5 to 10 years, 71 (31.7%); 11 to 20 years, 78 (34.8%); and over 20 years, 57 (25.4%); status of your organization: public companies, 114 (50.9%); and private companies, 110 (49.1%); position in the organization: top management, 28 (12.5%); middle management, 84 (37.5%); supervisor, 64 (28.6%); and others, 48 (21.4%) (Table 2).

The reliability analysis results showed that Cronbach’s alpha (α) value was the lowest in competitive advantage (70%). And the highest in the organizational intelligence (95%), whereas the total stability rate of 96%, which is higher than the standard measures 60%, confirms the study variables’ stability and internal consistency within the scale (Hanafi & Fadilah, 2017) (Table 3). The normality test illustrated that all skewness and kurtosis values are between ±2.58, indicating that all the study’s
variables are normal distribution (Hanafi & Fadilah, 2017) (Table 3).

The statistical averages as a whole were relatively of the IT capabilities ($M = 3.47, SD = .539$) where, IT infrastructure gives the best average ($M = 3.47, SD = .576$); while, organizational intelligence ($M = 3.70, SD = .495$) where, strategic vision gives the best average ($M = 3.88, SD = .561$); and moreover, competitive advantage ($M = 3.77, SD = .550$) where, exploiting market opportunities give the best average ($M = 3.47, SD = .671$), which explains the degree of use in the study’s variables by the e-business companies were between the top-medium level (5-Fully agree) from the perspective of the study community’s members (Table 3).

A multilinear correlation test was used to examine the relationships between the respondent’s answers for different variables. Consequently, the correlation is significant at $p < .01$, which showed all study variables’ validity. Each variable had a degree of correlation higher than any degree of correlation with any other variable included in this study. This test enhances the

### Table 2. Demographic Characteristics ($N = 224$).

| Variable                              | Category                        | Frequency | %  | Cumulative (%) |
|---------------------------------------|---------------------------------|-----------|----|-----------------|
| Gender                                | Male                            | 141       | 62.9| 62.9            |
|                                       | Female                          | 83        | 37.1| 100             |
| Full-time employees in a company      | Below 20 Employees              | 41        | 18.3| 18.3            |
|                                       | 20–50 Employees                 | 56        | 25.0| 43.3            |
|                                       | 51–100 Employees                | 82        | 36.6| 79.9            |
|                                       | Over 100 Employees              | 45        | 20.1| 100             |
| Organizations years in business       | Below 5 Years                   | 100       | 44.6| 44.6            |
|                                       | 5–10 Years                      | 86        | 38.4| 83              |
|                                       | 11–20 Years                     | 36        | 16.1| 99.1            |
|                                       | Over 20 Years                   | 2         | 9   | 100             |
| Years of e-commerce company products consumed | Less than 5 Years             | 18        | 8.0 | 8.0             |
|                                       | 5–10 Years                      | 71        | 31.7| 39.7            |
|                                       | 11–20 Years                     | 78        | 34.8| 74.5            |
|                                       | Over 20 Years                   | 57        | 25.4| 100             |
| Status of your organization           | Public companies                | 114       | 50.9| 50.9            |
|                                       | Private companies               | 110       | 49.1| 100             |
| Position in the organization          | Top management                  | 28        | 12.5| 12.5            |
|                                       | Middle management               | 84        | 37.5| 50              |
|                                       | Supervisor                      | 64        | 28.6| 78.6            |
|                                       | Others                          | 48        | 21.4| 100             |

### Table 3. Reliability, Test of Normality, and Statistical Averages.

| Variables              | Reliability ($\alpha$) | Skewness | Kurtosis | $M$    | SD    |
|------------------------|------------------------|----------|----------|--------|-------|
| IT capabilities        | .85                    | -.306    | -.075    | 3.47   | .539  |
| Infrastructure         | .69                    | -.296    | -.146    | 3.47   | .576  |
| Business spanning      | .70                    | -.248    | -.108    | 3.46   | .653  |
| Proactive stance       | .70                    | -.213    | -.284    | 3.47   | .680  |
| Organizational         | .95                    | -.786    | 0.605    | 3.70   | .495  |
| intelligence           | .72                    | -.776    | 0.597    | 3.77   | .561  |
| Strategic vision       | .64                    | -.517    | 0.561    | 3.71   | .493  |
| Shared fate            | .73                    | -.607    | 0.480    | 3.71   | .580  |
| Appetite for change    | .80                    | -.578    | 0.269    | 3.67   | .622  |
| Heart                  | .77                    | -.691    | 0.558    | 3.68   | .584  |
| Alignment & congruence | .68                    | -.746    | 0.567    | 3.69   | .510  |
| Knowledge deployment   | .80                    | -.855    | 1.005    | 3.61   | .619  |
| Performance pressure   | .70                    | -.997    | 1.374    | 3.77   | .550  |
| Competitive advantage  | .65                    | -.603    | 0.335    | 3.88   | .671  |
| Exploiting market      | .70                    | -.704    | 0.571    | 3.67   | .694  |
| opportunities          |                        |          |          |        |       |
| Neutralizing threats   | .96                    | -.696    | 0.635    | 3.65   | .528  |
| All variables          |                        |          |          |        |       |
degree of trust in the study variables’ independence (Hanafi & Fadilah, 2017; Sekaran & Bougie, 2016) (Table 4).

The tables above showed that the results are supported by statistical averages, normality, reliability, and validity tests, confirming that data are fit to perform multiple linear regression analyses to examine the study’s hypotheses and answer the study’s questions.

Hypotheses Tests

Model1, \( F(123.206) \), confirms that the model is significant at \( p \) value < .05, and the \( t \) test indicates that all of the variables are significant at \( p \) value < .05. Also, \( R^2 = .627 \) indicated that independent variables were explained by 63% from mediator variables. Moreover, proactive stance \( (\beta_1 = .363, p < .01) \), business spanning \( (\beta_2 = .180, p < .01) \), and infrastructure \( (\beta_1 = .394, p < .01) \), indicate that IT capabilities are positively associated with the organizational intelligence when it increases by one unit, organizational intelligence will increase by \( \beta \) as well (Table 5).

Model2abc, \( F(133.248, 261.507) \), confirms that the model is significant at \( p \) value < .05, and the \( t \) test indicates that all of the variables are significant at \( p \) value < .05. Also, \( R^2 = .372 \), \( .541 \) indicated that independent variables explain 37% of the variation in H2a and 54% in H2b from mediator variables. Moreover, the relationship between organizational intelligence positively affects exploiting market opportunities and neutralizing threats provides organizational intelligence at \( (\beta = .612, .735, p < .01) \), which tells us that organizational intelligence is positive and when it increases by one unit, exploiting market opportunities and neutralizing threats will increase by \( \beta \) as well (Table 5).

Model3abc, direct effect(s) of IT capabilities on exploiting market opportunities, according to \( F (20.683) \) can be explained as significant at \( p \) value < .05, and the \( t \) test indicates that all of the variables are significant at \( p \) value < .05, except business spanning, is not significant at \( p \) value > .05. Hence, business spanning can be excluded from study variables. Also, \( R^2 = .220 \) can be indicated to independent variables that can be explained by 22% from dependent variables. Moreover, the relationship between IT capabilities positively affects exploiting market opportunities provides proactive stance \( (\beta_1 = .172, p < .01) \); business spanning \( (\beta_2 = .069, p < .01) \); and infrastructure \( (\beta_1 = .409, p < .01) \), which tells us that IT capabilities are positive and when it increases by one unit, exploiting market opportunities will increase by \( \beta \) as well (Table 5).

Model4abc, direct effect(s) of IT capabilities on neutralizing threats, according to \( F (32.103) \) can be explained the model is significant at \( p \) value < .05, and the \( t \) test indicates that all of the variables are significant at \( p \) value < .05. Also, \( R^2 = .304 \) can be indicated to independent variables, explained by 30% from dependent variables. Furthermore, the relationship between IT capabilities positively affects neutralizing threats provides proactive stance \( (\beta_1 = .195, p < .01) \), business spanning \( (\beta_2 = .273, p < .01) \), and infrastructure \( (\beta_1 = .178, p < .01) \), which tells us that IT capabilities are positive and when it increases by one unit, neutralizing threats will increase by \( \beta \) as well (Table 5).

Model5abc, IT capabilities, and organizational intelligence have a positive effect on exploiting market opportunities. In what follows, the results relied on 95% of confidence and strengthened the CI of 5,000 smoothing samples. While the period specified by the upper limit (95% ULCI) and the lowest (95% LLCI) of the confidence interval for direct and indirect effects should not include the zero value among them (Hayes, 2015), the results showed that the direct effect of IT capabilities on exploiting market opportunities is
nearly significant at p value = .0466, but the LLCI/ULCI = −.4204/.0033, are not significant as they almost included zero value (Path c). On the other hand, the indirect effect when using organizational intelligence as a mediator between IT capabilities and exploiting market opportunities is significant at p value = .000, and LLCI/ULCI = .3670/.6668 are significant as the separation between maximum-minimum intervals confidence did not include the zero value (Path b). Furthermore, IT capabilities on organizational intelligence is significant at p value = .000, and LLCI/ULCI = .6432/.7961 are significant as the separation between maximum-minimum intervals confidence did not include the zero value (Path a).

In conclusion (H4a), Path a and Path b refer to the significance level, but Path c refers to no significance level (Hayes, 2015). Consequently, there is an important role to use in organizational intelligence as a mediator between IT capabilities and neutralizing threats (Table 7).

**Discussion**

The study aimed to clarify an overall theoretical framework to study IT capabilities’ effect on competitive advantage and examine organizational intelligence’s mediating role. The previous studies shed light that organizations can enhance their strategies through employees, suppliers, and other stakeholders who are more competent in dealing with predictable and unpredictable actions (Ismail & Al-Assa’ad, 2020). Consequently, developing the strategic vision for IT seeks to embrace new technology (Weill et al., 2002). In this study, IT capabilities have an apparent influence on competitive advantage and exploit market opportunities (Table 6).

| Model | Hypothesis | β   | R²   | F (p) | T (p) | Supported |
|-------|------------|-----|------|-------|-------|-----------|
| Model H1: IT capabilities have a positive effect on organizational intelligence. | .394¹ | .627 | 123.206 (.000*** | 8.273 (.000) |Accepted |
| Model H2a: organizational intelligence has a positive effect on exploiting market opportunities. | .612 | .375 | 133.248 (.000*** | 3.025 (.003) |Accepted |
| Model H2b: organizational intelligence has a positive effect on neutralizing threats. | .735 | .541 | 261.507 (.000*** | −.614 (.540) |Accepted |
| Model H3a: IT capabilities have a positive effect on exploiting market opportunities. | .409¹ | .220 | 20.683 (.000*** | 7.045 (.000) |Accepted |
| Model H3b: IT capabilities have a positive effect on neutralizing threats. | .178¹ | .304 | 32.103 (.000*** | 4.674 (.000) |Accepted |
| Model H4a: IT capabilities, and organizational intelligence have a positive effect on neutralizing threats. | .180² | .375 | 261.507 (.000*** | 5.318 (.000*** |Accepted |

Note. IT capabilities = infrastructure¹, business spanning², proactive stance³; organizational intelligence¹−²; Competitive advantage = exploiting market opportunities³, and neutralizing threats².

¹p < .10. ²p < .05. ³p < .01. ⁴p < .001.
Table 6. Results of Hypothesis Through Structural Model Analysis Between ITC and EMO With Moderating Role of OI.

| Causal path Model4a | R²  | F    | T   | p    | LLCI  | ULCI  | p     | LLCI/ULCI | LLCI/ULCI |
|---------------------|-----|------|-----|------|-------|-------|-------|-----------|-----------|
| Path a ITC → IO     | .62 | 354.94 | 18.84 | .000***| .6432 | .7961 | Sig. | Sig.      | Sig.      |
| Path b ITC → IO → EMO | .38 | 69.53 | 6.795 | .000***| .3670 | .6668 | Sig. | Sig.      | Sig.      |
| Path c ITC → EMO    | .22 | 46.17 | −2.0015 | .046** | −.4204 | −.0033 | Sig. | Not Sig.  |           |

Note. Dependent variable: EMO = exploiting market opportunities; predictors: (constant), ITC, OI = IT capabilities, organizational intelligence. LLCI = lower limit confidence interval; ULCI = upper limit confidence interval.

†p < .10. *p < .05. **p < .01. ***p < .001.

Table 7. Results of Hypothesis Through Structural Model Analysis Between ITC and NT With Moderating Role of OI.

| Causal path Model4b | R² | F    | T   | p    | LLCI  | ULCI  | p     | LLCI/ULCI | LLCI/ULCI |
|---------------------|----|------|-----|------|-------|-------|-------|-----------|-----------|
| Path a ITC → IO     | .62 | 354.94 | 18.84 | .000***| .6453 | .7961 | Sig. | Sig.      | Sig.      |
| Path b ITC → IO → NT | .54 | 131.115 | 9.824 | .000***| .5674 | .8522 | Sig. | Sig.      | Sig.      |
| Path c ITC → NT     | .30 | 96.510 | −0.934 | .035** | −.2748 | .0980 | Sig. | Not Sig.  |           |

Note. Dependent variable: NT = neutralizing threats; predictors: (constant), ITC, OI = IT capabilities, organizational intelligence. LLCI = lower limit confidence interval; ULCI = upper limit confidence interval.

†p < .10. *p < .05. **p < .01. ***p < .001.

Figure 2. The structural model illustrated the direct and indirect effects of the relationship between independent variables (ITCs) and dependent variables (CA) along with the mediation effect (OI).

Note. Indicates direct relationship (Path c). Indicates mediational relationship (Path a & Path b). ITC = IT capabilities; CA = competitive advantage; OI = organizational intelligence.
as a more significant dimension of organizational intelligence. These results are based on a smart program that supports the IT infrastructure and provides common characteristics such as physical components, networks, database, software, and social skills. Proactive stance clarified how the organization proactively uses IT resources to create new business opportunities.

A few previous studies shed light on organizational intelligence’s part in competitive advantage strategy (e.g., Azma et al., 2012; Che et al., 2015). Furthermore, this agreement with the findings presented by Hadj et al. (2020) argued that an increase of the competitive advantage develops the company’s chances to get a strategic vision and success by a set of organizational strategies. Consistent with this study, organizational intelligence has an apparent influence on competitive advantage (i.e., exploiting market opportunities and neutralizing threats strategies). These results can be explained by companies’ willingness to update their capabilities and achieve a competitive advantage, highlighting that it is imperative to support strategic vision as a source of competitive advantage in an active business environment.

There is a relation between manufacturing firms’ IT capabilities to be competitive and increase organizational performance (Chu et al., 2019). An essential impact of using it in the competitive advantage is that the organization possesses one or more competitive capabilities than competitors by exploiting market opportunities and neutralizing threats (Hadj et al., 2020). On the other hand, Chae et al. (2014) did not find any relationship between IT capabilities, competitive advantage, and business performance, while in this study, the IT capabilities (i.e., infrastructure and proactive stance) influenced both the exploiting market opportunities and neutralizing threats but did not show a positive effect on IT business spanning. These results are related to a lack of export of business spanning to exploit market opportunities due to the shortage of expert managers. The role of decision-makers at e-commerce companies is to put rules and procedure in place for the group of employees to solve the structural contradictions of intrinsic value, and promote the adaptation of one’s energies and harnessing them to an everyday purpose which improves competitive advantage and be better at exploiting market opportunities and neutralizing threats strategies.

The entry of new competitors quickly and surprisingly faced a risk to organizations in the business environment, where the previous studies recommended finding solutions reducing these contradictions and risks through improving better understanding of the gap between IT capabilities and competitive advantage (e.g., Balouei & Ghasemian, 2014; Chu et al., 2019; Grover et al., 2008; Lu & Ramamurthy, 2011; Wong & Yung, 2005). Hence, no previous literature has shown a link between IT capabilities incorporate with organizational intelligence as a mediator. This link seems essential in improving the competitive advantage, especially at e-commerce companies, to increase the ability to respond to the work environment changes. This hypothesis draws attention to solve the contradictions between IT and the fluctuations in the work environment. This study showed that IT capabilities seem positively associated with competitive advantage via organizational intelligence at e-commerce companies. The evidence put light on IT infrastructure and its ability to acquire, publish, collect, and recycle IT resources in support of competitive advantage strategies.

A proactive stance represents the company’s ability to explore and search for IT solutions and innovations and find new ways to enhance IT capabilities through developing companies’ vision. It means developing a strategic vision for IT that seeks to embrace new technology that contributes to developing and strengthening IT infrastructure. That is the exciting desire for change for smart organizations. It represents organizations’ enormous potential to change the internal environment in line with accelerating external environmental developments by adapting the organization’s organizational culture for stimulating processes to engage minds to meet challenges and explore new opportunities. While the business spanning improves the company’s management ability to take new ideas and use resources to support IT capabilities, it extends the company in adopting a clear vision for the development of IT strategy and IT business integration and strategic planning.

**Conclusions**

The data analysis results confirm that all the study hypotheses were supported. Moreover, organizational intelligence as a mediator significantly increased IT capabilities to control competitive advantage strategies to achieve better-exploiting market opportunities and neutralizing threats. The research results also showed that IT capabilities are fundamental to fulfill a competitive advantage and that IT capabilities may show better resolution to the mystery of the opposite effect of IT capabilities on competitive advantage. However, more organizational intelligence leads to better competitive advantage and enhance IT capabilities as well. The researchers recommend that this study attracts further discussion. It improves the literature and provides a holistic understanding of the relationship between IT capabilities, organizational intelligence, and competitive advantage.

**Implications**

*Academic contributions,* IT capabilities, and their link with different organizational outcomes have already been explored widely in different backgrounds, yet the e-commerce companies’ sector is found to be an understudied area found up to the best of researchers’ knowledge. This study aimed to uncover a suitable model for the e-commerce companies’ sector in the existing literature. The results of this study emphasized that IT capabilities have an apparent
influence on organizational intelligence. This study draws attention to the importance of the IT infrastructure, which represents the technological progress advancements in communication and computers, which must be accompanied by progress in organizational intelligence. Consequently, developing a strategic vision for IT capabilities seek to embrace new technology. Moreover, organizational intelligence as a mediator significantly increased IT capabilities to effect competitive advantage strategies to achieve better results in exploiting market opportunities and neutralizing threats. Finally, it should examine in depth the nature of specific IT capabilities and exploitations through providing skills to the enhancement of competitive advantage strategies via using organizational intelligence dimensions together (i.e., strategic vision, shared fate, appetite for change, heart, alignment & congruence, knowledge deployment, performance pressure).

From a practical perspective, this study, if adopted in real terms by e-commerce companies, can come up with the best steps to make their management members understand their job, encourage them to further their understanding of the contradictions of IT and competitive advantage (e.g., Lu & Ramamurthy, 2011). Organizational procedure or routines can simplify employees who have a different skill and proactive stance to perform a specific task, yet they can also impede their efforts to perform a different mission. The organization must pay attention to managers, enhance their skills, and set policies and culture to elevate its knowledge (Neirotti & Raguseo, 2017). Furthermore, leveraging the personnel intelligence in organizations, enhances IT Infrastructure, and boosts competitive advantage (Fink & Neumann, 2007). For instance, organizations may use alternative mechanisms such as consolidated capabilities, integrated data, and vendor-provided patches in enterprise systems to enable organizational intelligence. Alternatively, they could use a more flexible architecture. Moreover, companies need to continuously nurture and develop IT capabilities at the company level to manage and empower their IT resources via organizational intelligence, improving competitive advantage strategies.

**Limitations**

The results are based on the employees of e-commerce companies from only one geographical location. Therefore, there was a limitation by the design and size of the sample used. Although further data collection could have yielded more generalizable results, researchers believe that the study still contributes to science. The notion that there is a mediating role of organizational intelligence between IT capabilities and competitive advantage was supported. The reality of the Covid-19 pandemic also limited the study’s findings due to the partial closures of companies in the geographical location that this study took place.

**Future Research**

In conclusion, the authors believe that this study is useful to e-commerce companies’ professionals and researchers. In the business environment, the IT capabilities and organizational intelligence can create a healthy and improved modern technological environment and positively impact competitive advantage by structuring an assessment of where a particular e-commerce company is struggling in the competitive advantage process. This study’s usefulness to researchers is that the mediating role of organizational intelligence between IT capabilities and competitive advantage provides a structure that can focus research efforts and speed the attainment of results translated into the work environment. Specific suggestions for research include developing competitive advantage measures for various e-commerce companies based on this study relationship. Intervention studies testing different types of approaches to improving competitive advantage are much needed. Therefore, the authors recommend conducting more studies and researches in other companies and environments, especially in developed countries with significant technological development, to compare intellectual, cultural perspectives and the differences between companies and other countries. Finally, future research may consider merging qualitative and quantitative research designs to improve results.

**Declaration of Conflicting Interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Ethical Considerations**

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