



# An Empirical Study of the Effect of IT-enabled Organizational Intangibles on Competitive Advantage and Performance

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**Abstract.** IT-enabled organizational intangibles have been identified as key drivers of potential business value, mainly superior customer orientation, synergy, and intellectual capital through embedded superior skills in knowledge assets in environmental changes appropriately. This study aims to examine the effect of IT-enabled organizational intangibles on competitive advantage and organizational performance during the time period (2014 - 2019) in the Jordanian banking sector. IT-enabled organizational intangibles of the respective banks can be practiced to generate a competitive advantage and improve performance. Additionally, the study contributes to knowledge by demonstrating how IT-enabled organizational intangibles as a resource could create a competitive advantage in light of the resource-based view (RBV) theory of the firm. Thus, to achieve the research objective, a quantitative approach using a questionnaire was employed to collect data from 16 Jordanian banks; the targeted population is 853 of the Jordanian banks' managers. The empirical results showed that there is a positive impact of IT-enabled organizational intangibles on the competitive advantage and performance through playing enabling functions by promoting/leveraging the organization's resources and capabilities. Another explanation is that in the context given, IT-enabled organizational intangibles are used to fulfill cost and demand synergies and provide flexibility to create competitive value, which in turn responds to market needs quickly.

**Keywords:** *IT-enabled organizational intangibles, Performance, Resource-based view (RBV), Competitive advantage.*

## 1. Introduction

Investment in IT capabilities has been presumed to be essential to provide competitive advantage through business strategies implementation (Havakhor et al., 2019). Thus, the competitiveness of business, particularly in dynamic environments, lies in its organizational and managerial processes, composed of its specific assets and the paths accessible to it (Teece et al., 1997) to build a successful business that involves quality information systems to process all data and statistics (Mithas & Rust, 2016). Investment in intangible assets is rising and even exceeds investment in physical capital-either machinery or equipment-in several countries all over the world (Corrado et al., 2013).

The foundational work on IT-enabled organizational intangibles is illustrated by focusing on three key intangibles, which mainly are: customer orientation, knowledge assets, and synergies (Bharadwaj, 2000). IT-enabled organizational intangibles directly support the execution of strategy by improving the value/cost relationship of the firm in its competitive environment (Tejada-Malaspina & Jan, 2019). Here, the emphasis is on improving competitiveness through the use of IT-enabled intangibles in synergy by marketing new product/service with little added costs or adding value to product/service (Weibl & Hess, 2020). Meanwhile, the concept of IT-enabled intangibles is derived from the contemporary component demonstrated by the course of the historical evolution of IT capabilities in various areas. This component has been linked to facilitating the task of management to undertake strategic resources planning that focuses on customer relationship management, tracking shifts in customer choices more rapidly (Soltani

et al., 2018). Additionally, IT-enabled organizational intangibles, beyond estimating the external factors of uncertainty, and are interested in identifying new areas of investment and identifying the associated opportunities and threats in order to be more flexible and respond to the market needs rapidly (Bharadwaj, 2000). Moreover, IT-enabled organizational intangibles play an enabler role through embedded information and knowledge in its decision support systems and database (Ghasemaghaei et al., 2018).

At the moment, prior studies related to IT-enabled organizational intangibles are more focused on the role of achieving value-added through its contribution to organizations through knowledge management and strengthening its competitive position. However, few studies have explored issues regarding the new technologies in customer orientation, knowledge management embedded in information systems and databases, and synergies. In addition, there are limited studies investigating how firms can generate competitive advantage from IT-enabled organizational intangibles to manage their business goals (Makhloufi et al., 2018; Marinagi et al., 2014). The strategic use of IT-enabled organizational intangibles is a significant issue for decision-makers. This study focuses on making decisions regarding applying IT-enabled organizational intangibles in response to technological development and changes in business activities. Hence, the role of the IT-enabled organizational intangibles is to represent a strategic capability in the hands of organizations to face challenges through utilizing it as a tool to provide information for strategic planning (Luftman et al., 2013). Additionally, information systems are counted as a competitive advantage for organization continuity and survival by facing the challenges and achieving their business goals (Martinez-Simarro et al., 2015). Some scholars still do not give general judgment on whether IT components investments provide a competitive advantage and improved performance. Therefore, this study aims to examine the effect of IT-enabled intangibles on competitive advantage and performance in order to fill the gap in knowledge. The research question that this study has attempted to answer is: "whether IT-enabled organizational intangibles have contributed to the competitive advantage and organizational performance?". This study attempts to address this issue for the banking sector in Jordan, which is one of the developing countries in the Middle East.

## 2. Literature Review

The explicit recognition of the significance of intangible organizational resources is one of the most significant contributions to the RBV theory (Teece, 1998; Barney, 1991; Vergin and Qoronfleh, 1998; Russo and Fouts, 1997). However, many scientists have discussed the potential business value of some IT-enabled intangible resources extensively in the literature. Meanwhile, pay more attention to the IT-enabled intangible advantages in the literature, such as superior customer orientation (Harding et al., 2004; Chan, 2005; Brynjolfsson and Hitt, 1997; Narver and Slater, 1990), superior skill in knowledge assets and intellectual capital (Chen and Edgington, 2005; Bogdanowicz and Bailey, 2002; Botha, 2000), and response to environmental changes and market needs rapidly (Esmail, 2018; Oosterhout et al., 2006; Ekman and Angwin, 2007).

Many scientists emphasized that organizations perceive intangible organizational resources can generate potential business value through developing distinct capabilities. Findings of Weill (1993) work reported to adapt flexible and adaptable information technology systems to manage increasing customer needs at the lowest costs. D'Aveni (1994) also concluded that firms need to identify opportunities to exploit resources and capabilities to increase business value. Furthermore, literature review involves IT-enabled intangibles efficiently and effectively among different organizational units of firms (Bruno, 2002; Holden, 2003). The origin of this notion can be found in Porter (1985), who figured out that synergistic utility could be enhanced by a high level of resources sharing among business units. Later, referred to this principle, "related diversification" was found by Markides and Williamson (1994), which enables existing strategic assets to be shared among internal business units and the potential to develop new ones effectively to improve performance.

Bharadwaj (2000) added two more elements. The first added element is the potential to create cost-demand synergy that could provide tremendous business value by promoting new products and/or services at a little additional cost or by more effective product development (Barczak et al., 2007). The second added element is the ability to eliminate spatial, temporal and physical communication constraints, and enhance a platform for any IT service that demonstrates outstanding achievement in any related electronic communication methods.

However, many researchers have worked on IT-enabled intangibles, but the findings have not been consistent on whether it generates a competitive advantage. The manner of IT components are deployed could lead to firms gaining a competitive advantage. Mithas et al. (2012) support this point of view by analyzing the mechanism by which IT offers business benefits and conditions under which IT gains advantage over rivals. Lattemann (2005) also figures out that IT has provided firms with a variety of non-financial values, thus reducing the asymmetry of information between the level of management and shareholders, contributing to better corporate governance, which in turn has a direct effect on productivity and profitability. In addition, IT makes businesses more flexible, thus enhancing their ability to respond adequately to environmental changes (Sambamurthy et al., 2003). The growth potential generated by IT is recognized by capital markets, hence giving greater value to firms with superior organizational IT capabilities (Saunders and Brynjolfsson, 2016).

Recent studies have extensively discussed the positive effect of IT-enabled organizational intangibles among different business divisions in companies, which could yield synergistic benefits (Makhloufi et al., 2018). Shehata & Montash (2019) consider these concerns in terms of e-business firms. They claim that, based on electronically driven customers' relationship initiatives, major market forces and strategic opportunities, and last, from a supportive ICT environment, the competitive advantage approach can provide businesses with sustainable advantages over time. Another perception of the basis of competitive advantage is to achieve advantages through the consequences of learning or experience. On the one hand, the firm's knowledge-based view indicates that increased organizational learning within a business will provide valuable resources that can be leveraged to generate substantial advantage (Grant, 1996). Wimble et al. (2020) also developed a theoretical model of information technology and systematic risk and searched the relationship among IT components and their combination of organizational performance. Their study findings showed that the IT intensity is related to greater systematic risk. However, the reduction in systematic risk in four years lagged levels is explained by IT intensity. They explained the insignificant association due to increased flexibility and intangible capital.

From the above empirical evidence discussion, the debate about the effect of IT-enabled intangibles on competitive advantage and performance is continuing, which creates further investigations to explore this topic. We propose the following hypotheses concerning the interaction between these variables:

H1: IT-enabled organizational intangibles have a positive impact on competitive advantage in the Jordanian banking sector.

H2: IT-enabled organizational intangibles have a positive impact on performance in the Jordanian banking sector.

### 3. Methodology

A quantitative approach to data analysis was selected based on the explorative deductive method (Leedy & Ormrod, 2005). The developed questionnaire instrument was operationalized in line with previous studies carried out in this field using 5-Likert scales to find answers to the research problem. The aim of the research was to find potential solutions to a particular business issue in a new context by using existing theories (Neumann, 2003).

The target population for the analysis was around 853 managers across all Jordanian banks. A representative randomly selected sample of 270 respondents was chosen to collect the data requested based on their perceptions of the study's subject (Ryan, 2013). Targeted individuals in the aforementioned banks were members of these banks' business management, and they were asked to rate the bank they work on IT-enabled intangibles and competitiveness strategies. In attempt to develop a measure of "the contribution of IT to the competitive advantage", the term CAPITA (Competitive Advantage Provided by an Information System Application) is used by Sethi and King (1994) to measure the contribution of overall IT capabilities to a firm's competitive advantage were adapted and adjusted based on this instrument. The measurements used by CAPITA are cost effectiveness, functionality, and innovativeness. The cost efficiency dimension relates to the degree that IT capabilities enable a business to deliver services/products at a lowest price compared to the services/products of competitors. The functionality dimension refers to IT's ability to complete tasks and operations which may focus on inside or outside entities. Innovation is the third dimension, representing IT's contribution to innovative

behavior in a business. Table 1 shows all constructs and the measurement instruments for each of them which were used in this study.

Construct	Source	Items in survey
IT-enabled intangibles	Adopted from: Bharadwaj (2000)	IT-enabled intangibles to achieve cost-demand synergies.
		IT-enabled intangibles to eliminate constraints to communication.
		IT-enabled intangibles superiority in resources and capabilities sharing within organization units.
		IT-enabled intangibles superiority in managing customers' relationships.
		IT-enabled tracking of customer preferences changes quickly.
		IT-enabled intangibles ability to rapid and adequate response to market changes
		IT-enabled excellence in integrating/transferring/ applying knowledge.
Performance	Adopted from: (Powell & Dent-Micallef 1997)	Profitability
	Adopted from: (Capon et al., 1992)	Market-based performance
Competitive advantage	Sethi and King (1994)	effectiveness, functionality, and innovativeness

**Table 1. The measurement instruments for items**

For data analysis and hypothesis testing, the study employed Partial Least Squares (PLS) and Structured Equation Modeling (SEM) methods. In the context given, PLS is determined to be the most appropriate statistical tool. In order to ensure the validity of appropriate statistical conclusions, a series of statistical analysis steps have been carried out.

#### 4. Results and Discussions

PLS-SEM is used to test the developed hypotheses. The statistical analysis is performed by assessing the measurement and structural model.

##### 4.1 Measurement Model Assessment

Internal consistency reliability, convergent validity, and discriminant validity analysis are presented in the measurement validation as suggested by (Hair et al., 2016, Ramayah et al., 2018). Internal consistency reliability was assessed using Cronbach's alpha ( $\alpha$ ) and Composite Reliability (CR) metrics, respectively. As a consequence, Table 1 shows the measured Cronbach's alpha values for all constructs, which show that all values are between 0.938 and 0.943, with composite reliability ranging from 0.945 to 0.951, exceeding the 0.7 criterion value recommended by (Hair et al., 2016, Ramayah et al., 2018). Figure 1 depicts the results of the measurement model assessment obtained from PLS-SEM (Algorithm).

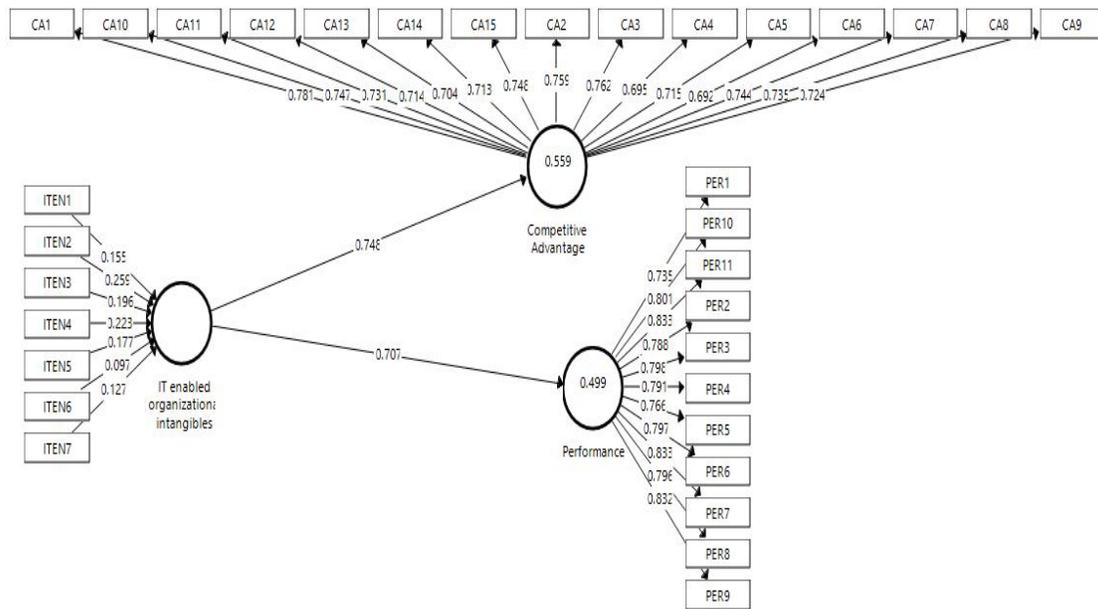


Figure 1. Measurement model assessment

The convergent validity value, which is calculated by examining each item's factor loadings and the Average Variance Extracted (AVE) as shown in Table 2 for all constructs. Hair et al. (2016) and Ramayah et al. (2018) recommended that the loading results for items of each dependent construct should exceed the 0.70 threshold. Table 1 the results show that reliability and convergent validity values of all constructs are good. Additionally, the recommended value of the factor loading should exceed 0.708 for all of the items, with the exception of CA4 and CA6, which had factor loadings of 0.695 and 0.692, respectively, and were excluded. In order to confirm the convergent validity, AVE value should be greater than 0.5 for each construct recommended by (Hair et al., 2016, Ramayah et al., 2018).

Construct	Item	Factor Loading	CA	CR	AVE
Competitive Advantage	CA1	0.781	0.938	0.945	0.535
	CA10	0.747			
	CA11	0.731			
	CA12	0.714			
	CA13	0.704			
	CA14	0.713			
	CA15	0.748			
	CA2	0.759			
	CA3	0.762			
	CA4	0.695			
	CA5	0.715			
	CA6	0.692			
	CA7	0.744			
CA8	0.735				
CA9	0.724				
Performance	PER1	0.735	0.943	0.951	0.637
	PER10	0.801			
	PER11	0.833			
	PER2	0.788			
	PER3	0.798			
	PER4	0.791			
	PER5	0.766			
	PER6	0.797			
	PER7	0.833			
PER8	0.796				

	PER9	0.832			
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**Table 2. Results of the measurement model**

The discriminant validity was then assessed using the Fornell and Larcker criteria, as suggested by the scientists (Fornell and Larcker, 1981). In PLS-SEM statistical research, the Fornell-Larcker criterion is commonly used to assess discriminant validity (Hair et al., 2016, Ramayah et al., 2018). In order to obtain satisfactory discriminant validity, AVE square root values should be greater than the other constructs correlations values in the structural model (Fornell and Larcker, 1981). The AVE square root for each construct is greater than the diagonal elements, as shown in Table 3.

Construct	Competitive Advantage	Performance
Competitive Advantage	0.731	
Performance	0.846	0.798

**Table 3. Discriminant validity (Fornell-Larker Criterion)**

To ensure that multicollinearity does not exist, Variance Inflation Factor (VIF) values below 3.3 are considered acceptable in determining low multicollinearity. Based on the results in Table 4, VIF values were found to be lower than the recommended threshold of 5 (Hair Jr et al., 2013, 2016). The t values must be higher than 1.64 for significance levels of 5% to establish significant outer weights. The outer weights in the formative measurement model are significantly different from zero, and t-value assesses each indicator weight's significance. Therefore, all formative indicators remain for further analysis.

Construct	Item	Outer Weights	t-values	VIF
IT_enabled organizational intangibles	ITEN1	0.155	1.565	3.541
	ITEN2	0.259	3.426	2.436
	ITEN3	0.196	2.217	3.056
	ITEN4	0.223	2.700	2.426
	ITEN5	0.177	2.393	2.324
	ITEN6	0.097	1.200	1.971
	ITEN7	0.127	1.658	1.936

**Table 4. Construct assessment**

## 4.2 Structural Model Assessment

The bootstrapping technique is used in statistical analysis with 5,000 resamples in order to evaluate the developed model of this study. By measuring path coefficients, p-value, and t-value, the values should be less than 0.05 and greater than 1.96. All path coefficients are significant, with p-values less than 0.000 and t-values greater than 1.96 (Hair et al., 2016), see Table 5.

Hypotheses	Relationship	Coefficient	t value	P value	Results
H1	IT_enabled organizational intangibles -> Competitive Advantage	0.748	22.746	0.000	Supported
H2	IT_enabled organizational intangibles -> Performance	0.707	21.570	0.000	Supported

**Table 5. Path Coefficients and hypotheses testing**

Figure 2 shows the path coefficients between IT-enabled intangibles and competitive advantage and performance.

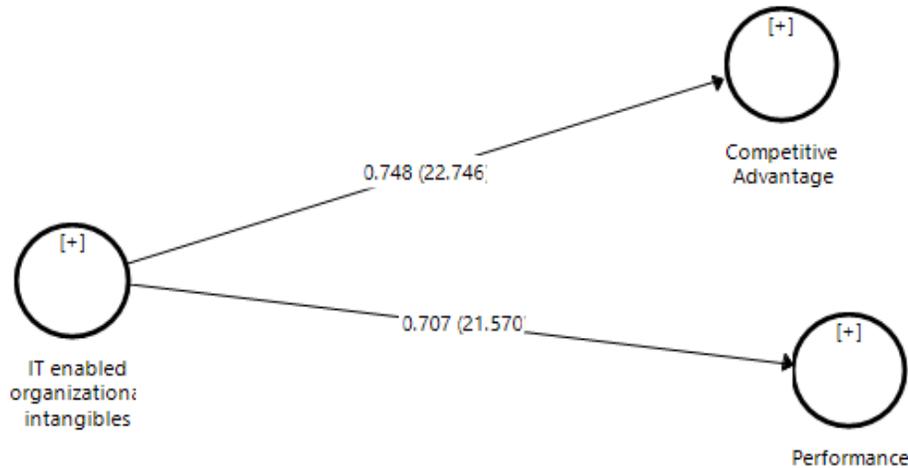


Figure 2. Path Coefficients

The results of the study, simultaneously, indirectly confirms the view of Bharadwaj (2000), which indicate that IT-enabled intangibles could become a strong element of IT capabilities can improve firm performance through promoting/leveraging the firm's resources and capabilities by playing an effective role in various aspects, such as product/service quality or customer orientation/service.

Illustrations of IT-enabled organizational intangibles involve valuable skills to direct and transfer knowledge, e.g., Chen and Edgington (2005) evaluate the value of organizational knowledge in order to respond rapidly to environmental changes to an appropriate degree that is consistent with flexibility and requires agility as used by, e.g., Oosterhout et al (2006) and, e.g., Barczak et al (2007).

Ahuja & Chan (2017) showed that significant aspects of IT use to fulfill cost and demand synergies, as well as providing flexibility, were previously stated in literature over several years ago. This combination among resources and capabilities appears to be an intentional manifestation; this finding therefore suggests that firms could improve the development and marketing of new services through IT-enabled intangibles. This is also in line with the findings of Saunders and Brynjolfsson (2016) and Esmail et al. (2018), which demonstrated flexibility as important IT-enabled capabilities that provide businesses with advantages to enhance product/service design and development.

## 5. Conclusions and Implications

It is important to understand the creation of a competitive advantage as a critical component of organizational routines in the light of the RBV. The present study developed to be more evaluation-specific for asset intangibles, where intangibles are not accounted for, and the relevant expenses are perceived as a cost rather than an investment in the best of cases.

Furthermore, as demonstrated in the Grant model (Grant, 1996), this study has provided theoretical contribution by providing board view through organizational intangibles assets in the IT field, which may, in turn, serve as a conceptual basis for IS research in the IT area through understanding the transformation of resources into valuable capabilities.

IT-related research should consider the practical implications of IT-enabled intangibles and this IT component should not be completely ignored, but that some attention should be given to the customer preferences, knowledge assets and synergies that might become more substantial in the coming future. Knowledge and intellectual capital that are embedded in information systems and databases across all business units, such as predicting potential business needs and preparing the integration of IT and business units and the management of information systems, could play an essential role in the development of vital day-to-day organizational running.

Consequently, business managers may need to concentrate on a combination of IT-enabled intangibles elements, as well as competitive advantage strategy, and while development of capabilities may generate value and competitive advantage on its own, IT-enabled organizational intangibles provide such value to organizations. This finding is significant as it sheds new light on how firms generate value through the deployment of intangible assets in the banking industry. The fact is that the collected data for this study was from the banking sector in Jordan only, so this study cannot be generalized to other developing economies. Consequently, future research will include gathering data from other banks in other countries as part of a longitudinal analysis. The developed model can also be improved and extended in an attempt to provide more variables for further analysis.

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