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Effects of IS Quality on Firm Performance from the Perspective of a Business Executive: The Role of Business Strategy

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ABSTRACT

There is a lack of knowledge on information system (IS) success evaluation at the organizational level. This study aims to integrate the resource-based view (RBV), process-oriented approach, and IS success models into an integrated model to examine the relationship between IS quality (ISQ) and performance impact. In addition, it examines the moderating effect of a firm's business strategy on this relationship. The model is tested on a sample of 102 Tunisian firms via the structural equation modeling method. The results show that business process performance (BPP) and individual performance (IP) play a role of partial mediation in the relationship between ISQ and organizational performance (OP). The results also indicate that the mediation process between ISQ and OP via the BPP differs depending on the business strategy. This article is one of a few early efforts that address the role of business strategy in explaining the performance impacts of ISQ. Practically, the proposed model provides managers with a valuable tool to evaluate IS success at multiple levels of an organization.

KEYWORDS

Business Strategy, Business-Process Performance, Individual Performance, IS Quality, Organizational Performance

INTRODUCTION

Firms invest considerably in information technologies (IT) and information systems (IS) for business objectives like achieving operational excellence, improving decision making, or achieving competitive advantage. Thus, managers and researchers focus on the evaluation of implemented IS success (Jeyaraj, 2020; Schryen, 2013). On the one hand, managers seek to maximize returns on IT and IS investments. On the other hand, for researchers, IS success is an enduring and central topic to IS research (Jeyaraj & Zadeh, 2020). However, the evaluation of IS success has been largely analyzed at the individual level (Jeyaraj, 2020). Furthermore, some organization-level studies that examined IS performance impacts have found mixed results (ZareRavasan & Krčál, 2021). Given the lack of knowledge on IS success evaluation at the organizational level, this study expects to increase insight regarding assessment in that context (Al-Okaily, 2021; Jeyaraj & Dwivedi, 2020).

Prior studies used diverse theoretical perspectives to explore the impact of IS on firm performance (ZareRavasan & Krčál, 2021). Some scholars have drawn on the resource-based view (RBV) to

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identify IS resources and capabilities as a source of competitive advantage and performance (Arora & Rahman, 2017; Bharadwaj, 2000; Mata et al., 1995). Others have adopted a process-oriented approach to explain that the IS impact on firm performance is mediated by business process performance (BPP) (Aydiner et al., 2019; Melville et al., 2004; Soh & Markus, 1995; Tallon et al., 2000). Another group of scholars has focused on DeLone and McLean's (1992, 2003) IS success models for assessing IS impact on both individual and organizational performance (OP) (Al-Okaily, 2021; Gu & Jung, 2013; Ifinedo et al., 2010).

At the organizational level, IS performance impacts can be referred to as the impacts of IS on the performance of employees, business processes, or the organization (Yassaee & Mettler, 2015). Although these levels of performance were highly interdependent (Rummler & Brache, 1995), few studies have been conducted to simultaneously assess the impact of IS on individual performance (IP), BPP, and OP (Schryen, 2013). Thus, the purpose of this study is to integrate the RBV, process-oriented approach, and IS success models into an integrated model to examine the relationship between IS and its performance impacts. Given the importance of IS quality (ISQ) to understand the performance impacts of IS (DeLone & McLean, 1992, 2003), this study aims to assess the impact of ISQ on the three levels of performance from an organization-centered perspective.

The research on OP impacts of IS neglects the consideration of contextual factors. Some studies identified the important role of firm, industry, and country factors when explaining performance impacts of IS (Melville et al., 2004; Schryen, 2013). For this purpose, this study also examines the moderating effect of a firm's business strategy on the relationship between ISQ and performance. This, to the author's knowledge, has not been explored. It is unclear whether ISQ differentially affects organizational outcomes when organizations have different strategic orientations.

More formally, the research questions addressed in this article are:

- What are the impacts of ISQ on individual, business-process, and organizational performance?
- Does the type of firm's strategy business moderate the relationship between ISQ and performance?

This research studied the direct and indirect effects of ISQ on OP. It examined the mediating role of BPP and IP in modeling the indirect impact of ISQ on OP and the moderating effect of business strategy on this relationship.

The article is organized as follows. Section 2 provides the theoretical foundations on the subject. Section 3 describes the research model and hypotheses. Section 4 describes the research methodology. Section 5 presents empirical results. Section 6 contains a discussion of results, implications, limitations, and guidelines for future research. Section 7 includes the conclusion.

THEORETICAL FOUNDATIONS

This study examined the literature on the RBV, process-oriented approach, and IS success models to investigate the IS impact on firm performance. These theories provided a theoretical basis for the research model.

RBV

The RBV argues that a firm gains a competitive advantage if its resources are valuable, rare, imperfectly imitable, and nonsubstitutable (Barney, 1991). The RBV provides a robust framework for analyzing the relationship between IS and performance (Wade & Hulland, 2004). Some scholars found that a sophisticated IT infrastructure and skilled IS personnel were valuable IS resources to be used as potential sources of competitive advantage (Mata et al., 1995; Ross et al., 1996). Others argued that IS capabilities, defined as a firm's capability to mobilize and deploy IS resources in combination with other resources and capabilities, allowed firms to achieve superior performance (Bharadwaj, 2000;

Stoel & Muhanna, 2009). Thus, OP depends on the attributes and qualities of a firm's IS resources and capabilities. These must be valuable, rare, inimitable, and nonsubstitutable (Ji-fan Ren et al., 2017).

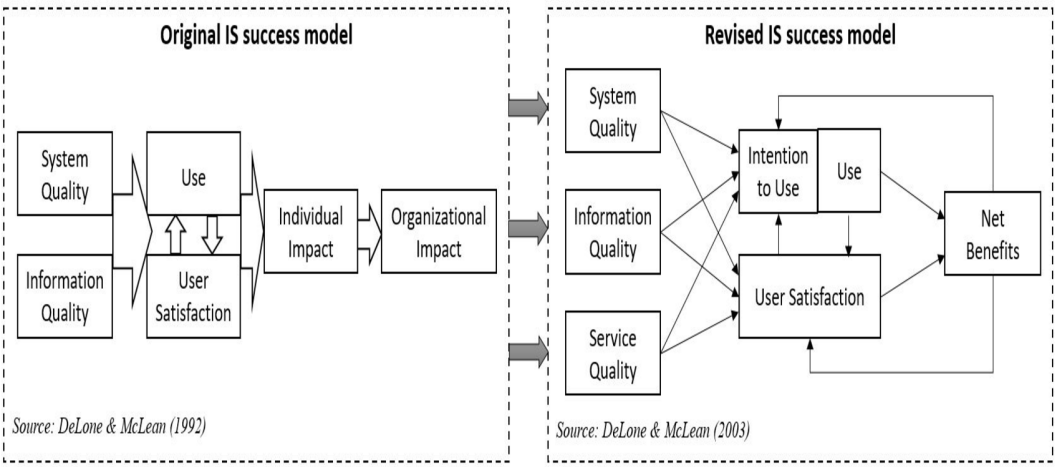
Process-Oriented Approach

The process-oriented approach was built on the assumption that IS did not directly affect firm performance, arguing that the first-order impact of IS occurred at the process level. Soh and Markus (1995) stated that IT expenditures led to IT assets. This led to IT impacts, which led to OP. Mooney et al. (1995) argued that IT created business value via automational, informational, and transformational effects on the operational and management processes. Melville et al. (2004) argued that the deployment of IS resources and organizational resources in business processes improved BPP, which could, in turn, affect OP.

IS Success Models

The DeLone and McLean IS success models received considerable attention in the IS literature, providing a robust framework for understanding IS and its impacts (Jeyaraj, 2020). The original model of DeLone and McLean (1992) suggested that system and information quality affected, independently or collectively, system use and user satisfaction. This, in turn, determined the individual impact and, lastly, influenced organizational impact (DeLone & McLean, 1992). However, this model has received criticisms from scholars like Pitt et al. (1995) and Seddon (1997). In response to the feedback, DeLone and McLean revised the IS success model in 2003. They introduced an independent variable, "service quality", to reflect the importance of service and support in successful IS systems. They added the "intention to use" dimension, specifying user attitudes toward the system. They replaced the individual and organizational impact dimensions of their original IS success model with the "net benefits" construct (DeLone & McLean, 2003). Figure 1 presents both the original and revised IS success models.

Figure 1. DeLone and McLean's IS success models



The DeLone and McLean (2003) IS success model is the most appropriate for measuring IS success or effectiveness at the organizational level (Sedera et al., 2004). It has been tested as a whole (Wang & Liao, 2008), in part (Gorla et al., 2010), or by adding modifications (Al-Okaily, 2021; Chang & King, 2005).

RESEARCH MODEL AND HYPOTHESES

This study draws on the literature on the RBV, process-oriented approach, and IS success models to present the research model in Figure 2.

This study adopts the DeLone and McLean (2003) IS success model; however, it does not include the following intermediate dimensions: intention to use; use; and user satisfaction (for reasons given by Sedera et al. [2004], Gorla et al. [2010], and Ifinedo et al. [2010]). Therefore, this study focuses on the effect of ISQ attributes on net benefits; however, it assesses the impact separately on individual and organizational performance.

ISQ is a multidimensional construct composed of system quality, information quality, and service quality (Chang & King, 2005; Delone & McLean, 2003; Gorla et al., 2010). System quality refers to the technical aspects of IS. Information quality represents the characteristics of outputs provided by IS. Service quality refers to the support offered by the service provider. Based on the DeLone and McLean (2003) IS success model for studying the organizational impact of ISQ, Gorla et al. (2010) and Ali et al. (2016) found that system quality, information quality, and service quality are positively associated with OP. The OP is greater when the ISQ is high.

According to the RBV, these ISQ parameters are related to IS resources and capabilities. Indeed:

an IT infrastructure including modern technology, well-integrated and flexible IT architecture, and GUI-oriented software is required for high system quality. Human IT resources in the form of both technical and managerial skills are necessary to provide better service quality and information quality. IT capability in operational competence will result in better service quality in terms of reliability and assurance. (Gorla et al., 2010, p. 221)

Thus, better IS resources and capabilities will lead to better system quality, information quality, and service quality. This, in turn, will improve OP (Gorla et al., 2010; Gu & Jung, 2013; Ji-fan Ren et al., 2017). Thus, the following hypothesis is advanced:

H1: ISQ has a significant positive effect on OP.

The organizational impact of ISQ is affected by the individual impact (DeLone & McLean, 1992). From an organization-centric perspective, IS impact is measured at the individual level to evaluate IS-related benefits for the organization (Gable et al., 2008). IP represents the benefits that individuals who use IS receive in terms of improving individual productivity, job performance, and decision-making performance (Delone & McLean, 1992, 2003). Ifinedo et al. (2010) reported that system quality, information quality, and service quality are positively related to IP. This, in turn, affected OP. Gu and Jung (2013) found that ISQ as a multidimensional construct influenced usefulness (perceived impact of IS on task quickness, productivity, and job effectiveness), which, in turn, indirectly affected OP. Al-Okaily (2021) found similar results. The following additional hypotheses are proposed:

H2: ISQ has a significant positive effect on IP.
H3: IP has a significant positive effect on OP.

According to the process-oriented approach, the first-order impact of IS occurs at the process level (Mooney et al., 1995; Soh & Markus, 1995). The deployment of IS resources and organizational resources in business processes improves BPP, which can affect OP (Aydiner et al., 2019; Melville et al., 2004; Schwarz et al., 2010; Tallon et al., 2010). Chang and King (2005) argued that IS resources and capabilities used by the IS function could produce IS performance (system performance, information effectiveness, and service performance). This, in turn, influenced the effectiveness of business processes and OP. Santa et al. (2020) noted that IS effectiveness had a positive impact on operational effectiveness, which improved firm performance. Likewise, Gu and Jung (2013) found that ISQ influenced BPP, which affected OP. The following hypotheses are, therefore, advanced:

H4: ISQ has a significant positive effect on BPP.
H5: BPP has a significant positive effect on OP.

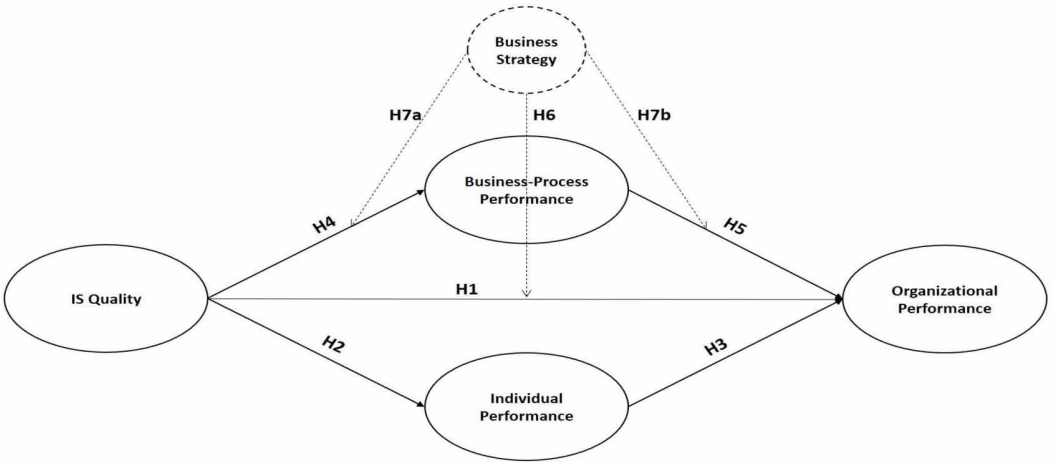
Some studies showed that the relationship between IS and performance differed according to the type of business strategy followed by a firm (Beimborn et al., 2006; Croteau et al., 2001; Sabherwal & Chan, 2001). These studies used a typology by Miles and Snow (1978), which identified the following four types of business strategy: (1) defender; (2) prospector; (3) analyzer; and (4) reactor. A defender concentrates on protecting its current markets, maintaining stable growth, and serving its current customers. In contrast, a prospector is an innovative firm that seeks new markets and opportunities. In addition, a prospector is oriented toward growth and risk. An analyzer shares both prospector and defender characteristics. It maintains current markets and customer satisfaction. In addition, it has places a moderate emphasis on innovation. Although a reactor has no clear strategy, it reacts to changes in the environment and drifts with events.

Croteau et al. (2001) and Sabherwal and Chan (2001) found that the strategic alignment of IS improves the OP of prospectors and analyzers. Beimborn et al. (2006) found that the alignment of IS to business activities influences BPP. This effect varies by the type of firm's business strategy. Thus, in the perspective of IS-business alignment, the impact of IS on BPP and OP differ according to the type of business strategy followed by a firm.

This study hypothesized that the type of business strategy moderates direct and indirect relationship through BPP between ISQ and OP.

H6: Business strategy moderates the relationship between ISQ and OP.
H7a: Business strategy moderates the relationship between ISQ and BPP.
H7b: Business strategy moderates the relationship between BPP and OP.

Figure 2. Research model



RESEARCH METHOD

Measurement of the Variables

The study is composed of four main constructs: (1) ISQ; (2) IP; (3) BPP; and (4) OP. It contains one moderator variable (business strategy) and two control variables. Each of the four main constructs has multi-item scales derived from relevant prior studies (measurement items and their sources are shown in Table 2). Each item was measured through five-point Likert-type scales (1, strongly disagree to 5, strongly agree). According to Jarvis et al. (2003), all the constructs were operationalized as reflective constructs. For business strategy, the study used the measures developed by Conant et al. (1990) to identify the Miles and Snow (1978) archetypes (Defender, Prospector, Analyzer, and Reactor). The control variables included industry type and firm size as measured by the number of employees.

DATA COLLECTION

The primary data for the study was collected through a cross-sectional survey questionnaire (drawing on a relevant literature review). The procedure suggested by Hair et al. (2007) was adopted to establish the content validity of the measures used in this study. Five academic IS researchers and two experts reviewed each item of the questionnaire and assessed its content, scope, and purpose. After revising the questionnaire, a pilot test was conducted on a sample of 30 firms to ensure the reliability and validity of the measures. Thus, some items were removed to reduce ambiguity.

The target population of this study was Tunisian firms that implemented and used an IS for over two years. Indeed, a two-year lapse is required to perceive the effect of IS investment on firm performance (Schwarz et al., 2010). IS refers to all applications used in the firm. There is no sampling frame for the target population in Tunisia; therefore, the convenience sampling method was used (Jolibert & Jourdan, 2011). The targeted respondents was top business executives because they are the most informed about IS performance impacts.

A strategy of multiple respondents was adopted because it allowed for the collection of rich data, reduced bias, and improved accuracy (Elbashir et al., 2008). DeLone and McLean (1992) argued that executives are ideally positioned to act as key informants in a qualitative assessment of IS impacts in their businesses. IS executives may overestimate ISQ because it reflects on the performance of the IS department. In fact, these executives may not be able to assess organizational impacts of IS because they do not act as end-users. Therefore, business executives are in an ideal position to assess ISQ and its impact on OP (Gorla et al., 2010). To do this, they can rely on personal experience as IS users. In addition, they can absorb the opinions of their peers and subordinates regarding the performance impacts of IS (Tallon et al., 2000). Thus, respondents included the chief executive officer (CEO) and three business executives (chief operating officers, chief product officers, chief marketing officer, etc.). Consequently, the average scores from multiple respondents were used as the organizational response. The unit of analysis in this study was the organization level.

The questionnaires were administered face-to-face. The part of the questionnaire relating to business strategy was completed by the CEO; the part relating to ISQ and beneðts derived from IS use was completed by the CEO and three business executives. Excluded firms included five firms with IS deployed in the last two years and 15 firms who held a reactor type strategic position. Studies like Sabherwal and Chan (2001) and Beimborn et al. (2006) excluded reactors from analysis as they are not considered to have a consistent strategy. Thus, the sample size was 102 firms: 34 defenders; 34 prospectors; and 34 analyzers. Table 1 shows the distribution of firms by industry and size.

Table 1. Sample characteristics

	Obs.	Percentage (%)
Industry		
Food	27	26.5
Building materials	15	14.7
Metallurgy	24	23.5
Chemical	9	8.8
Petroleum	4	3.9
Wood	9	8.8
Pulp and paper	14	13.7
Number of employees		
10-49	6	5.9
50-249	50	49
250-499	28	27.5
500-1000	18	17.6

RESULTS

To estimate the research model, the study used the partial least square structural equation method (PLS-SEM) approach because the model contains composites variables and the sample size is potentially small (Hair et al., 2016). According to Chin et al. (2003), this study's sample size (102) is larger than the required threshold to achieve PLS assessment. SmartPLS 3.3.2 software was used for data analysis (Ringle et al., 2015).

Assessment of Measurement Model

To assess the measurement model, the study examined indicator reliability, construct reliability, convergent validity, and discriminant validity (Hair et al., 2016). Concerning indicator reliability, all the item loadings should be greater than 0.7. Hence, four items were eliminated. Table 2 reveals that the final items were reliable and the values of Cronbach's alpha and composite reliabilities were all greater than 0.7. All the constructs were reliable.

Convergent validity was assessed by examining the average variance extracted (AVE) of first-order factors. This should be higher than 0.5 (Hair et al., 2016). For second-order factors, the path coefficients from each second-order factor to first-order factors were high magnitude, surpassing the suggested cut-off of 0.7 (Chin et al., 1997). Hence, two first-order factors of BPP were eliminated (process planning and support and product enhancement). Table 2 shows that convergent validity was achieved.

Table 2. Reliability and convergent validity of constructs

Constructs (Measurement items and references)	Item loadings	Cronbach's alpha	Composite reliability	AVE	Factor loadings
ISQ (DeLone & McLean, 2003)					
System quality (DeLone & McLean, 2003; Nelson et al., 2005; Sedera et al., 2004)		**0.79**	**0.88**	**0.70**	**0.87**
SQ1 (IS is reliable over time.)	0.72				
SQ2 (IS is flexible to make changes easily.)	0.89				
SQ3 (IS is easy to use.)	0.89				
SQ4* (IS is easy to learn.)	*				
Information quality (DeLone & McLean, 2003; Nelson et al., 2005; Sedera et al., 2004)		**0.89**	**0.92**	**0.75**	**0.95**
IQ1 (The information from our IS is accurate.)	0.77				
IQ2 (The information from our IS is concise.)	0.89				
IQ3 (The information from our IS is relevant.)	0.92				
IQ4 (The information from our IS is up to date.)	0.88				
Service quality (Chang & King, 2005; Kettinger & Lee, 1997)		**0.82**	**0.90**	**0.74**	**0.88**
SRQ1 (IS staff give prompt service to users.)	0.81				
SRQ2 (IS staff have the knowledge and skill to do their job well.)	0.88				
SRQ3 (IS staff understands the specifics needs of users.)	0.89				
SRQ4* (IS staff provides its services at the promised time.)	*				
BPP (Gu & Jung, 2013; Tallon et al., 2000)					
Planning and support*					*
PS1 (IS improved internal communication and coordination.)	*				
PS2 (IS strengthened strategic planning.)	*				
PS3 (IS enabled your company to adopt new organizational structures.)	*				
PS4 (IS improved management's decision making.)	*				
Supplier relations		**0.88**	**0.93**	**0.81**	**0.72**
SR1 (IS helped reduce variance in supplier lead times.)	0.92				
SR2 (IS helped develop close relationships with suppliers.)	0.85				
SR3 (IS improved monitoring of the quality of products from suppliers.)	0.93				
SR4* (IS helped the corporation gain leverage over its suppliers.)	*				
Production and operation		**0.85**	**0.90**	**0.69**	**0.82**
PO1 (IS improved production throughput or service volumes.)	0.87				
PO2 (IS enhanced operating flexibility.)	0.88				
PO3 (IS improved the productivity of labor.)	0.75				

Table 1 continued on next page

Table 2 continued

Constructs (Measurement items and references)	Item loadings	Cronbach's alpha	Composite reliability	AVE	Factor loadings
PO4 (IS enhanced utilization of machinery and equipment.)	0.83				
Product enhancement*					*
PE1 (IS enhanced the value of products by embedding IT in them.)	*				
PE2 (IS decreased the cost of designing new products.)	*				
PE 3 (IS reduced the time to market new products.)	*				
PE4 (IS enhanced product quality.)	*				
Sales and marketing support		**0.88**	**0.92**	**0.74**	**0.81**
SM1 (IS enabled the identification of market trends.)	0.84				
SM2 (IS increased the ability to anticipate customer needs.)	0.85				
SM3 (IS enabled salespeople to increase sales per customer.)	0.86				
SM4 (IS improved the accuracy of sales forecasts.)	0.88				
Customer relations		**0.83**	**0.89**	**0.67**	**0.85**
CR1 (IS enhanced the ability to provide after-sales service and support.)	0.78				
CR2 (IS enhanced the flexibility and responsiveness to customer needs.)	0.85				
CR3 (IS improved the distribution of goods and services.)	0.85				
CR4 (IS enhanced the ability to attract and retain customers.)	0.78				
IP (Igbaria & Tan, 1997)		**0.90**	**0.94**	**0.83**	
IP1 (Using IS improves my decision-making quality.)	0.93				
IP2 (Using IS improves my job performance.)	0.92				
IP3 (Using IS in my job increases my productivity.)	0.89				
IP4* (Using IS enhances my effectiveness in my job.)	*				
OP (Gorla et al., 2010; Gu & Jung, 2013; Ifinedo et al., 2010; Melville et al., 2004)		**0.92**	**0.94**	**0.77**	
OP1 (IS enhanced revenue.)	0.89				
OP2 (IS reduced costs.)	0.86				
OP3 (IS increased profitability.)	0.90				
OP4 (IS increased the company's market share.)	0.88				
OP5 (IS strengthened competitive advantage.)	0.85				

Notes: *Constructs and items were dropped during the assessment of measurement model.

The study used the criterion of Fornell and Larcker (1981) to test discriminant validity. The square root of AVE for each construct should be higher than the correlation between any pair of factors. Table 3 shows that each first-order construct is distinct from other constructs. For the second-order constructs, the results also demonstrated that the square root of AVE for ISQ (0.8) and BPP (0.7) were higher than their correlation (0.57). Thus, there was adequate discriminant validity.

Table 3. Interconstruct correlations and square root of AVE

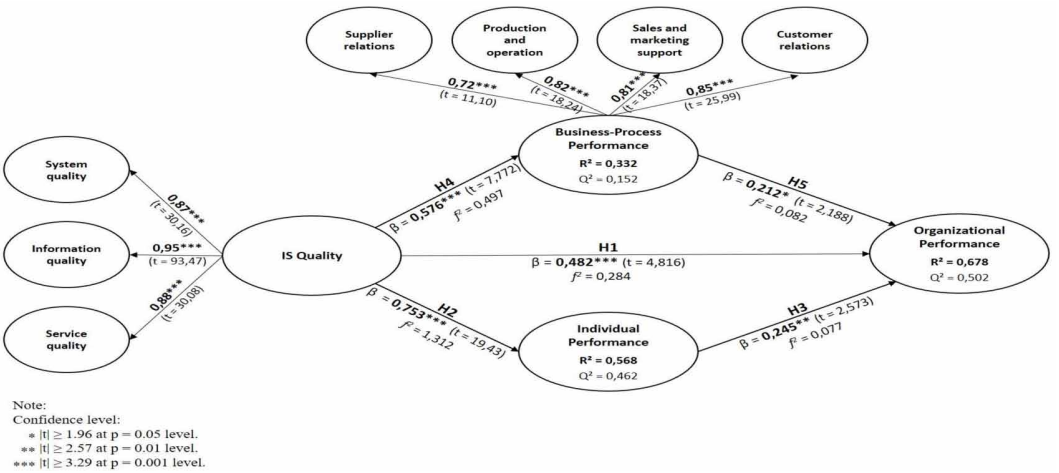
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) System quality	**0.84**								
(2) Information quality	0.76	**0.87**							
(3) Service quality	0.62	0.76	**0.86**						
(4) Supplier relations	0.37	0.38	0.36	**0.89**					
(5) Production and operation	0.38	0.40	0.38	0.53	**0.83**				
(6) Sales and marketing support	0.36	0.47	0.49	0.42	0.52	**0.86**			
(7) Customer relations	0.47	0.47	0.45	0.50	0.62	0.61	**0.82**		
(8) IP	0.65	0.70	0.68	0.49	0.40	0.42	0.46	**0.91**	
(9) OP	0.66	0.72	0.72	0.47	0.41	0.52	0.56	0.72	**0.88**

Note: Diagonal elements are square roots of AVE, off-diagonal elements are correlations.

Assessment of Structural Model

To evaluate the structured model, the study used a five-step approach set by Hair et al. (2016). First, the study used the variance inflation factor (VIF) values to test the constructs for multicollinearity. The results showed that all VIF obtained were less than five; therefore, multicollinearity did not exist. Second, the study assessed the quality of the structural model via bootstrapping (subsamples = 5,000; n = 102) to determine the significance of paths within the structural model. Third, the study evaluated the coefficients of determination (R^2), which represent the amount of explained variance of the endogenous constructs in the structural model. Fourth, the study calculated the f^2 effect sizes to assess an exogenous construct's effect on an endogenous construct. f^2 values of 0.02, 0.15, and 0.35 indicated a small, medium, or large effect, respectively. Fifth, to assess to which extent the prediction in structural model was successful, the study used a blindfolding procedure for calculating Q^2 values. These should be above 0. Figure 3 shows the results of the structural model evaluation (path coefficients (β), t-value (t), f^2, R^2, and Q^2).

Figure 3. Results of structural model evaluation



As illustrated in Figure 3, ISQ had a significant positive relationship with OP. This confirmed H1. ISQ significantly enhanced IP, explaining 56.8% of its variance. Consequently, H2 was supported. The IP had a significant positive relationship with OP to provide support for H3. ISQ significantly enhanced BPP, explaining 33.2% of its variance. Thus, H4 was confirmed. BPP was also positively associated with OP, which provides support for H5. In summary, the study found support for all the hypotheses (H1-H5). The model substantially explained 67.8% of the variation in OP. Regarding the control variables, industry type and firm size did not significantly influence OP.

Test of Mediation Effects

A literature review revealed that BPP and IP may mediate the impact of ISQ on OP. It is a multiple mediation with two mediators. Hair et al. (2016) recommended the bootstrapping approach, which involves testing the significance of the direct effect between ISQ and OP and each indirect effect via each mediator. In addition, the total indirect effect should be significant. Table 4 shows the results of multiple mediation analysis. According to Hair et al. (2016), the indirect and direct effects are all significant, pointing in the same direction. Therefore, it is a complementary mediation (partial mediation). IP and BPP partially mediated the relationship between ISQ and OP.

Table 4. Mediation test results

Total effects of ISQ on OP			Direct effect of ISQ on OP			Indirect effects of ISQ on OP		
Coefficient	**t-value**		**Coefficient**	**t-value**			**Coefficient**	**t-value**
0.789***	22.484		0.482***	4.816		**Total** (via IP and BPP)	0.307***	3.386
						Specific (Via IP)	0.185*	2.478
						Specific (Via BPP)	0.122*	2.040

Test of Moderation Effects

The study used the procedure from Muller et al. (2005) to test moderation effects. Multiple linear regression analyses were performed with SmartPLS to estimate the following three equations (4 to 6). OP = organizational performance, ISQ = IS quality, BPP = business process performance, and BS = business strategy. The * shows the multiplication of two variables (i.e., interaction term for testing moderating effect).

$$OP = \beta 40 + \beta 41\ (ISQ) + \beta 42\ (BS) + \beta 43\ (ISQ*BS) + \epsilon 4 \quad (4)$$

$$BPP = \beta 50 + \beta 51\ (ISQ) + \beta 52\ (BS) + \beta 53\ (ISQ*BS) + \epsilon 5 \quad (5)$$

$$OP = \beta 60 + \beta 61\ (ISQ) + \beta 62\ (BS) + \beta 63\ (ISQ*BS) + \beta 64\ (BPP) + \beta 65\ (BPP*BS) + \epsilon 6 \quad (6)$$

As seen in Table 5, the results from equation 4 show that β41 was significant. β43 was not significant. Therefore, the effect of ISQ on OP was not moderated by business strategy. H6 was not supported.

The estimation of equation 5 reveal a significant effect of ISQ and ISQ and business strategy interaction on BPP (β51 and β53, respectively). This significant interaction is indicative of moderated mediation.

The results from equation 6 show that β64 was significant. β65 was not significant. The relationship between BPP and OP was not moderated by business strategy. Consequently, H7b was not supported.

According to Muller et al. (2005), the results (β41, β53, β64, and β63 were significant but β43 was not significant) indicated that a moderated mediation pattern exists in the model. This supports H7a. Moderated mediation implies that the indirect effect of ISQ (via BPP) varies as a function of business strategy.

Table 5. PLS regression results for the moderation

	Equation 4 (Criterion OP)		**Equation 5 (Criterion BPP)**		**Equation 6 (Criterion OP)**	
Predictors	**β**	**t-value**	**β**	**t-value**	**β**	**t-value**
ISQ	**0.807*** (β41)	19.010	**0.479*** (β51)	5.790	**0.642*** (β61)	8.654
BS	0.005 (β42)	0.080	-0.094 (β52)	1.077	0.036 (β62)	0.594
ISQ*BS	-0.065 (β43)	1.323	**0.203*** (β53)	2.338	**-0.181*** (β63)	2.313
BPP					**0.280**** (β64)	2.901
BPP*BS					0.128 (β65)	1.342

DISCUSSION

This section discusses the results, research and practice implications, limitations, and guidelines for future research.

Implications for Research

This study contributes to the literature that relies on RBV. It agrees that OP depends on the attributes and qualities of a firm's IS resources and capabilities (Gorla et al., 2010; Gu & Jung, 2013; Ji-fan Ren et al., 2017). The results also prove the theoretical background of the process-oriented approach and IS success model.

The direct relationship between ISQ and BPP proves that ISQ improves the benefits that arise as a result of the use of IS to support value chain activities and increase BPP (Melville et al., 2004; Santa et al., 2020; Schwarz et al., 2010; Tallon et al., 2000). A direct relationship between BPP and OP is also the result of a deep connection between processes and their outputs. As Gu and Jung (2013) argued, "higher process capabilities improve BPP and OP" (p. 90). Improved BPP is central to a firm's responsiveness to market and revenue growth. Thus, this study's results confirmed prior studies, noting that BPP may act as a mediator between ISQ and OP. ISQ creates value for a firm because it provides benefits of improving business processes in the accomplishment of OP.

Likewise, the direct relationship between ISQ and IP proves that a high level of quality of IS means that the benefits to individuals using IS will also be high (for example, improving individual productivity, job performance, and decision-making performance). The association between IP and OP indicates that higher levels of benefits for the individual using IS will lead to an overall gain for the organization. This study's results are compatible with Delone and McLean (1992, 2003), Ifinedo et al. (2010), Gu and Jung (2013), and Al-Okaily (2021). In addition, the findings provide empirical support for the mediating role of IP in the model, where few studies have been reported. More specifically, IP represents a mechanism that underlies the relationship between ISQ and OP.

This study developed an integrated model based on the RBV, process-based approach, and IS success model to improve understanding of how IS affects OP. The integrated model and its statistical tests are the main theoretical contribution in the stream of IS research. Associations among these theoretical perspectives enrich our understanding of processes through which IS creates performance impacts. OP can be understood from an integrated perspective. ISQ directly (RBV part) and indirectly through BPP (process-based approach part) and IP (IS success model part) influence OP. This modeling provides a better understanding of how IS contributes to performance by explaining the path of this impact.

This study's results have consequences for IS success models. It provides evidence for additional links in the DeLone and McLean (2003) IS success model that are not explicitly incorporated, particularly considering the indirect path between ISQ and OP through IP and BPP. In addition, it is important to note that this research is among few studies that examine IS success using organization as a level of analysis (Al-Okaily, 2021; Jeyaraj, 2020; Jeyaraj & Dwivedi, 2020).

The second theoretical contribution of this research consists in the proposal of a model to explain the contribution of IS to the OP by integrating the business strategy as a moderator variable in the analysis. To the author's knowledge, this was not explored in previous work. The study also shows the moderating role of strategic orientation, particularly on the indirect effect between ISQ and OP. The mediation process between ISQ and OP via BPP differs depending on the firm's business strategy.

Implications for Practice

This study gives firms a framework to check the success of IS deployed in their organizations. The developed and validated questionnaire is found to be a reliable instrument for assessing the performance of IS for individuals, the business process, and the entire organization. Thus, firms can evaluate their IS to identify and solve specific quality problems at different levels of system, information, and service. This instrument also evaluates IS contribution to business processes through indicators specific to each process. As a result, managers can identify which processes are important to a firm vs. those that are poorly supported by IS. This diagnostic tool can also be used to evaluate the contribution of IS in helping employees perform better on the job. Therefore, managers have several performance indicators to guide the design and implementation of the IS master plan.

Limitations and Future Research

This study is not without limitations. First, the choice of Tunisia as the survey setting limits the generalizability of the study's findings that are more specific to the context of a developing country. Thus, future research focused on the behaviors of both developing and developed country firms may provide interesting observations and comparisons. The differences in the stage of economic development, organizational structures, and culture between developing and developed countries may influence the performance impacts of IS. Second, this study's cross-sectional design collected data at the same time. A longitudinal study may expand current research by capturing the dynamics of the IS use phenomenon, tracking ISQ and organizational benefits over time. Third, the perceptual performance indicators in this study could be accompanied by objective indicators to provide a robust picture of the relationship between IS and OP.

CONCLUSION

While it is difficult for all organizations to invest in IS resources and skills, successful organizations continue to gain competitive advantages by connecting IS with performance. The findings of this study are an important step for theoretical and practical reflection in the IS field. This article enriches the IS literature by studying IS success at the organizational level. Associations among three theoretical approaches enrich our understanding of how ISQ contributes to performance from a business executive perspective. The article is one of a few early efforts that address the role of a firm's business strategy in explaining the performance impacts of ISQ. The proposed model gives managers a valuable tool to evaluate IS success at multiple levels of the organization.

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