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Article

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OPERATIONS, INFORMATION & TECHNOLOGY | RESEARCH ARTICLE

An empirical investigation of enterprise system user satisfaction antecedents in Jordanian commercial banks

Aws Al-Okaily^{1*}, Manaf Al-Okaily², Teoh Ai Ping¹, Hamzah Al-Mawali³ and Hala Zaidan³

Abstract: One substantial issue that is still unexplored enough in the academic literature is user satisfaction antecedents in the Enterprise System (ES) domain. To address this issue, this paper draws upon the Information System Success Model (ISSM) to explore the influence of system quality, information quality, and service quality on both perceived usefulness and user satisfaction, as well as the influence of perceived usefulness on user satisfaction. This research was done using a cross-sectional survey of ES users in Jordanian commercial banks. In total, 208 usable responses were analysed via Smart-PLS software. The empirical findings found substantial and significant support for all model propositions except for the relationship between service quality and user satisfaction, which was insignificant. This research is the first of its kind to test the factors that impact ES user satisfaction in Jordan. It is also among the first works that tested the factors that determine user satisfaction using ISSM for mandatory systems instead of voluntary systems. Finally, our findings offer policymakers and practitioners of Jordanian commercial banks

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PUBLIC INTEREST STATEMENT

The implementation of Enterprises System (ES) has grown rapidly world-wide in recent years to enable banks to compete in the rigorous business environment. To date, several banks are still struggling to derive ES benefits as its implementation was not as successful as expected. One major trouble that caused ES failure is the lack of user satisfaction. The specific objective of this paper therefore is to investigate whether system quality, information quality, service quality and perceived usefulness are key antecedents of ES user satisfaction in Jordanian commercial banks. The research findings found significant support for our research model propositions except for the influence of service quality on user satisfaction, which was insignificant. This is one of the first studies of its kind and is the first in Jordan which adequately covers the critical factors antecedents of ES user satisfaction.

insight into the factors that determine user satisfaction, thereby improving the effectiveness of these complex systems.

Subjects: Computer Science; General; Information & Communication Technology; ICT; Information Technology

Keywords: Information system success model; enterprise systems; enterprise resource planning; user satisfaction

1. Introduction

Recent challenges in the complex business environment have motivated organisations to adopt effective technologies to survive and succeed (Al-Okaily, Al-Okaily et al., 2020). In today's digitised world, Enterprise Resource Planning (ERP) or Enterprise Systems (ES) have become a critical investment for firms that wish to maintain competitive advantages and succeed. Traditionally, ES is recognised as computer-based systems designed to integrate business functions across an organisation such as human resources, planning, inventory, marketing, and finance (Hasan et al., 2019). Generally, organisations around the world apply ES to enable the seamless flow of information and address the issue of information fragmentation within organisations (Abugabah et al., 2015). Besides, ES provides several organisational benefits in terms of enhanced productivity, managerial decision-making, competitiveness, and cost reductions (Ifinedo et al., 2010; Ouiddad et al., 2020). A recent report by Market Research Future in 2018 pointed out that the ES market generated a revenue of about 47\$ billion, which, in turn, is expected to continue to increase by 7 per cent until 2022. Notably, ES adoption costs range from 2 to 4\$ million in small and mid-sized firms and exceed 100\$ million in large firms (Abu-Shanab et al., 2015).

Despite growing investments and great ES market expansion, researchers and practitioners have indicated that several firms have failed to reap the expected benefits from ES implementation (Costa et al., 2020; Lee et al., 2020; Malik & Khan, 2020; Nkasu, 2020; Ouiddad et al., 2020). In some cases, Dell doubted that its ES would be able to account for their sales volume, leading them to cancel ES implementation and write off 115 USD million in lost ES investments (Nkasu, 2020). As a further case, FoxMeyer, during their bankruptcy proceedings, blamed their loss of profitability on their ES provider, leading to them launching a 500\$ million lawsuit (Roekel & Van Der Steen, 2019). On top of that, a survey among 64 Fortune 500 firms indicated that 25 per cent of the firms suffered from poor ES performance (Ha & Ahn, 2014). Given the high stakes involved, organisations today are interested in finding the best way to leverage ES value and to make their adoption a success (Nguyen & Luc, 2018). Realizing benefits from ES investments depends on satisfying system users (Somers et al., 2003). The related academic literature has highlighted that user satisfaction is a factor that has a major influence on ES implementation success (Al-Jabri, 2015; Ghazaleh et al., 2019). This is due to the weak conceptualization or empirically difficult validation of alternative measures (Goel et al., 2013).

It is noteworthy that there is a need to explore the factors that influence or are related to user satisfaction when implementing such a system (Vaezi et al., 2016). In Jordan, commercial banks invested heavily in ES in response to the complex business environment (Almahamid, 2019). However, not all cases of ES implementation led to significant organizational benefits and competitive advantage in competing at both local and global levels (Alkhaffaf et al., 2018). One major issue that results in ES failure is the lack of user satisfaction and acceptance (Al-Jabri, 2015). Therefore, in-depth exploration and understanding of factors that increase user satisfaction is vital to a successful ES implementation (Almajali et al., 2016). A number of research studies have been published to explore the factors determining user satisfaction; however, there is a paucity of empirical works in mandatory settings such as ES project. Meanwhile, little explicit attention has been devoted to issues in developing countries such as Jordan compared to developed countries (Almajali et al., 2016).

On the basis of this background, the fundamental motivation behind this research is borne out of the paucity of research works investigating the factors affecting ES user satisfaction in mandatory settings, which is a compelling yet unresolved issue. Therefore, studying the key factors that affect the user satisfaction of ES projects in Jordanian commercial banks is a focal issue in this current study. To accomplish this, DeLone and McLean (2003) model of IS success (which we will refer to as ISSM) was used as a theoretical foundation in this research. The purpose of this work is to investigate for the first time whether information quality, system quality and service quality have a positive impact on both perceived usefulness and user satisfaction as well as the impact of perceived usefulness on ES user satisfaction in Jordanian commercial banks. This work placed system use outside our research model and adopted perceived usefulness factor from Seddon (1997) model because system use is deemed to be more related to user behavior than a success measure. As the first work of its kind in Jordan, the paper's contribution stems from studying the antecedents of ES user satisfaction for mandatory systems using ISSM, particularly in Jordan because these systems are designed differently in developed countries and IS infrastructure in Jordan is comparatively weak.

The rest of this article is structured as follows. Section 2 discusses the body of literature related to this work and the research hypotheses. Then, Section 3 presents the research methods used in this study. The research results are illustrated in Section 4 while Section 5 contains the discussion. Research implications are addressed in Section 6. Future research directions are given in the last section.

2. Theoretical background and hypotheses formulation

2.1. User satisfaction

The gain in popularity of satisfaction as a measure of IS success may possibly be due to the lack of a commonly used and comprehensive IS instrument in the literature (Djong et al., 2018). Satisfaction, in relation to systems, is commonly manifested through affective feelings (Wang & Song, 2017). This makes intuitive sense, and an individual satisfied with a system would be more willing to use that system. Satisfaction is commonly built over time through a series of affective interactions, making it “subjective sum of interactive experiences” (Liaw & Huang, 2013). In ES context, user satisfaction measures how much users believe that a system meets their requirements, as a system with dissatisfied users can hardly be called a success (Somers et al., 2003). Put another way, when a user's needs are provided for by a system, they will be satisfied with its use (Dezdar & Ainin, 2011). However, some researchers have claimed that satisfaction is a result of successful system adoption instead of being a success factor in mandatory settings (Bernroider, 2008; Gable et al., 2008; Gorla et al., 2010; Ifinedo et al., 2010). Meanwhile, others have argued that even when system use is compulsory, satisfaction may engender the extent of system use and capture user mental acceptance (Hsieh et al., 2012; Huang, 2020; Lee & Xia, 2011). Unquestionably, satisfaction has a unique role in affecting system effectiveness in mandatory settings (Alkrajji, 2020; Chopra & Rajan, 2016). From this point of view, we can conclude that users can obstruct or underuse a system if they do not perceive it to be valuable, easy to use, and useful in both mandatory and voluntary environments. The lack of agreement of satisfaction as a success factor has resulted in perplexing and inconsistent findings in IS measurement. This research attempts, therefore, to minimize the confusion by determining if user satisfaction plays a vital role in addressing and measuring ES success, even in mandatory settings.

2.2. Information system success model

Although several research attempts have assessed user satisfaction, satisfaction remains complex and its substance varies with system properties (Liaw & Huang, 2013). DeLone and McLean (1992) developed an IS success model that is considered among the most influential IS theories on user satisfaction (Costa et al., 2016). Their model postulated that information quality and system quality are key determinants of user satisfaction and system use, that user satisfaction and system use influence are direct antecedents of individual impact, and individual impact has an influence

on organisational impact (DeLone & McLean, 1992). The model factors are interrelated, rather than independent (DeLone & McLean, 1992). Shortly after the model's publication, Seddon and Kiew (1996) inserted perceived usefulness rather than system use as a success indicator. Authors like Seddon (1997) reported that links between individual and organisational impact must be the opposite of user satisfaction. He added that ISSM was confusing due to its combining both variance and process models. Pitt and colleagues argued that IS success or effectiveness "focuses on the products rather than the services of the IS function. Thus, there is a danger that IS researchers will miss measure IS effectiveness if they do not include in their assessment package a measure of IS service quality" (Pitt et al., 1995, p. 173). Others postulated that IS impacts multiple stakeholders such as customers, workgroups, industry, and society, in addition to individuals and organisations.

Looking at criticism and technological advancement, in 2003, DeLone and McLean revised their base model by incorporating service quality as a third quality dimension. The use construct was expanded to include intention to use and feedback links were added to the model. In addition, individual and organisational impact measures were combined into a single construct called net benefits (DeLone & McLean, 2003). Like their base model, the revised model included six dimensions and proposed that IS can be assessed through quality dimensions (system, information, and service) and that these dimensions influence user satisfaction and use/intention to use. Net benefits were realized by user satisfaction and system usage. This updated model could be utilized at multiple analytical levels based on specific objectives. At a later point in time, researchers and practitioners regarded satisfaction as a good surrogate indicator of IS success, and they widely adopted success model as the theoretical basis for identifying the factors that impact user satisfaction in various IS disciplines. Among these studies, Seddon and Kiew (1996) introduced a re-specified ISSM to examine the effect of system quality, information quality, and usefulness on satisfaction. They found that system quality, information quality, and usefulness explained three-quarter of user satisfaction variance. In their research, Floropoulos et al. (2010) investigated the effect of information quality, system quality, and service quality on usefulness and satisfaction. They revealed that the impact of system quality on usefulness was extremely low and that the impact of system quality on satisfaction was insignificant.

Likewise, Chen et al. (2013) examined the influence of quality factors (system, service, and information) on perceived usefulness and user satisfaction in e-commerce. They concluded that system quality had no influence on usefulness and that information quality did not affect satisfaction. In a later publication, Chen et al. (2015) validated a model for e-tax system success that included five factors related to this research, which were information quality, system quality, service quality, usefulness, and satisfaction. Their findings showed that the impact of system quality on usefulness and satisfaction was insignificant and that there was an insignificant relationship between service quality and satisfaction. Despite the above, empirical studies have considered that quality dimensions and usefulness are factors that determine user satisfaction. Nonetheless, previous empirical works have not been consistent. There has been no study up to now that has proven these interrelationships in mandatory systems like the use of ES in Jordan. Based on this, our current research attempts to fill this gap in the literature.

2.3. Hypotheses formulation

The success model has been excessively adopted throughout IS research. Nevertheless, it needs refinements to fit proposed system specificities. Factors determining user satisfaction in voluntarily used systems may not be fully suitable for ES because it is a mandatory system for users in an organisation. A theoretical model predicting ES user satisfaction was developed in the present work. The developed model replaced system usage dimension with perceived usefulness. The utilization of system use dimension has several sustained criticisms in this domain. For instance, Seddon and Kiew (1996) argued that usefulness is a more logical factor in both mandatory and voluntary system use settings. This is because non-use does not essentially show that a system is non-useful, but it may simply be that potential system users have other tasks to do and perform

(Seddon, 1997). Equivalently, some postulate that system usage is an irrelevant dimension of success when system usage is obligatory (Al-Okaily, Abd Rahman et al., 2020; Bernroider, 2008; Floropoulos et al., 2010; Ifinedo et al., 2010) and it is also considered an antecedent factor, not a factor of system success (Gable et al., 2008; Gorla et al., 2010). From our viewpoint, users in a mandatory setting have no other option other than to use ES to perform their tasks. The proposed model also excludes the net benefit dimension to suit the research objectives as we aim to explore the antecedents of user satisfaction. It can be observed from our research model in Figure 1 that system quality, information quality, and service quality can singularly and jointly influence usefulness and satisfaction. Our model also predicts that perceived usefulness has a significant direct influence on ES users' satisfaction.

2.3.1. System quality

System quality is a factor commonly cited and used by researchers since it has been incorporated into the success model (Gharaibeh & Gharaibeh, 2020). Specifically, it is related to the ability of a system to meet user needs through reliability, ease of use, functionality, flexibility, and other metrics (DeLone & McLean, 2016). High-level system features in terms of hardware specifications, network infrastructure, and system design enhance user tasks and productivity, thereby having a positive effect on usefulness (Seddon, 1997; Seddon & Kiew, 1996; Sun & Mouakket, 2015). Delone and McLean (2003) proposed that system quality will cause improvements in user satisfaction. This claim supports user perceptions of satisfaction by providing users with a wide array of effective system characteristics. Earlier studies have supported the assumption that system quality is a critical determinant of satisfaction (Costa et al., 2020; Shim & Jo, 2020; Sun & Mouakket, 2015). Correspondingly, a recent study by Chen et al. (2015) found an insignificant impact of system quality on perceived usefulness and user satisfaction. The empirical pieces of evidence noted above are incompatible; hence, the following two hypotheses were formulated:

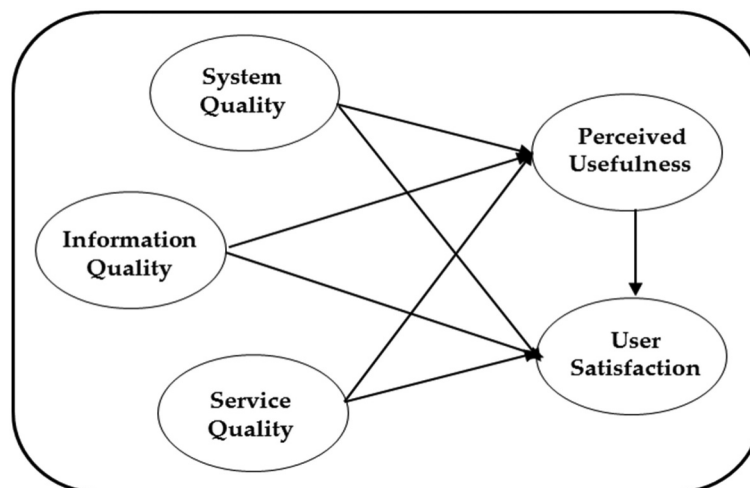
H1. System quality has a positive effect on usefulness.

H2. System quality has a positive effect on satisfaction.

2.3.2. Information quality

Unlike system quality, information quality is traditionally associated with features of the system outputs. Desired features include accuracy, comparability, reliability, completeness, conciseness, currency, relevance, timeliness, format, and other criteria (DeLone & McLean, 2016). Information quality is often adopted as a prominent factor for IS success measurement. Seddon and Kiew

Figure 1. Research model.



(1996) proposed and empirically supported that high information quality leads to an increase in perceived usefulness. High information quality improves user performance and their decision-making reinforces perceptions of usefulness (Chen et al., 2015; Rana et al., 2015; Sun & Mouakket, 2015). Information quality is also considered a pillar of satisfaction, as high information quality is positively associated with overall satisfaction as users were able to acquire information that meets their standards after using a system (Chou & Hong, 2013; Cidral et al., 2018; Ouiddad et al., 2020). Meanwhile, other researchers did not find a significant influence of information quality on usefulness (Cidral et al., 2018; Kulkarni et al., 2006; Landrum et al., 2010) or between information quality and satisfaction (Chen et al., 2013). Accordingly, these inconsistent findings motivated us to develop the following two hypotheses:

H3. Information quality has a positive effect on usefulness.

H4. Information quality has a positive effect on satisfaction.

2.3.3. Service quality

Along with system and information quality, service quality indicates to support and service delivered by an IS department or service provider in terms of quick responsiveness, reliability, assurance, and empathy (DeLone & McLean, 2016). It has been generally accepted that service quality directly impacts usefulness and fulfils expectations for performance and effort (Chen et al., 2013, 2015). Similar results were obtained for an e-tax system analyzed by Floropoulos et al. (2010), whose findings indicated service quality was an important and strong determinant of usefulness. DeLone and McLean (2003) assumed that high level of provided service in solving user-problems has an influence user satisfaction with the system. This claim was also supported empirically by Rana et al. (2015), Chen et al. (2013), and Chou and Hong (2013) who found that service quality significantly influenced satisfaction. On the other hand, some researchers found an insignificant influence of service quality on both usefulness (Al-Fraihat et al., 2020; Gorla & Somers, 2014) and satisfaction (Chen et al., 2015; Ouiddad et al., 2020). Therefore, these conflicting findings lead us to suggest the following hypotheses:

H5. Service quality has a positive effect on usefulness.

H6. Service quality has a positive effect on satisfaction.

2.3.4. Perceived usefulness

Perceived usefulness reflects user perceptions that using a system will improve their task and job performance (Hua et al., 2017; Seddon, 1997). A user who perceives a system as providing value is more likely to be satisfied with ES than one who does not (Al-Jabri, 2015). Concurrently, a system that achieves tasks is useful and enhances user performance, improving user satisfaction (Chen et al., 2015). In terms of the link between usefulness and satisfaction, Seddon (1997) modified the success model and found that satisfaction was impacted directly by perceived usefulness. Another series of works have also proved that user perceptions influence satisfaction (Abu-Shanab & Saleh, 2014; Al-Jabri, 2015; Rezvani et al., 2017; Sun & Mouakket, 2015; Wang & song, 2017). Other authors have shown that perceived usefulness does have a positive influence on user satisfaction (Gorla & Somers, 2014; Landrum et al., 2010; Sabherwal et al., 2006). Therefore, the mixed results in this regard lead us to formulate our last hypothesis:

H7. Usefulness has a positive effect on satisfaction.

3. Research methods

3.1. Measurement development

A questionnaire design coupled with a quantitative approach was used in this research as an effective instrument for data collection, especially when the research variables have been well established, as the relevant data for these variables can be easily collected (Almahamid, 2019). The survey questionnaire was developed in the English language and then translated into Arabic. The questionnaire had three parts: the cover letter, demographics information, and survey measurement. A 20-item questionnaire was used for each of the five factors included in our proposed model, which were derived from related literature to ensure their validity and reliability. For example, system quality was assessed through four measures adapted from Wu and Wong's (2006) widely cited study. For information quality, the adapted four measures were acquired by Aldholay et al. (2018). Service quality was measured through four indicators adapted from a recently published study by Ouiddad et al. (2020). The four measures used to evaluate perceived usefulness were adapted from Rezvani et al. (2017). Satisfaction was measured using four indicators adapted from Ouiddad et al. (2020). To capture respondent perceptions a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree" was employed.

3.2. Procedure and sampling

This research selected all 13 Jordanian commercial banks as a research sample (Central bank of Jordan, 2019). These banks were chosen due to its importance to the Jordanian economy as it is a prominent business sector that directly contributes to about a quarter of the national economy and also its high level of development in applying ERP in this sector. As the researchers were not able to acquire a full list of ES users in each bank due to security and privacy reasons (Almahamid, 2019), we relied on the purposive (judgment) sampling technique as a kind of non-probability sampling of ES users. For the sample size, we followed the standards of J.F. Hair et al. (2013), who suggested that the number of informants should be at least eight times greater than the number of research model constructs. As a primary result, our minimum research sample required was $N = 40$. Meanwhile, we are not dismissing the "10 times rule" widely used in related studies using PLS-SEM software; this rule simply indicates that the minimum sample size should be ten times the maximum number of paths leading to endogenous latent variables in the proposed research model (Hwang et al., 2016; Ouiddad et al., 2020). The paths leading to endogenous constructs in our proposed model were 7; thus, the minimum of our sample size would be 70.

For greater accuracy, a statistical power test was undertaken for sample size determination as suggested by Cohen (1992). The test was calculated by an a priori power analysis conducted using G*Power software (Faul et al., 2009). The result showed that the required sample size is 270 participants to achieve an effect size moderate to 0.15, an alpha equal to 0.05 and a power equal to 0.80. However, in order to avoid sample size error and to take into account the occurrence of non-response by some participants, our research sample size was increased as recommended by Barlett et al. (2001). In total, 300 questionnaires were sent to Chief Information Officers (CIOs) at the bank headquarters in Amman city asking them to distribute questionnaires to actual ES users. That is because CIOs are particularly responsible for IT management practice in their banks. In total, 226 responses were collected and 208 were deemed usable for subsequent analysis. J. F. Hair et al. (1995) considered a number of 200 to be ideal. Therefore, our final sample contained 208 ES users, which made it suitable for a PLS analysis purposes. The description of the sample profile is shown in Table 1.

4. Research results

This research utilized PLS-SEM software to empirically validate our proposed model. This software has been extensively used in complex models with relatively small data sets (Hair Jr et al., 2020) and in IS studies (M. Al-Okaily et al., 2020; Lutfi et al., 2020). The PLS model consists of two main models, which are the outer (measurement) model and the inner (structural) model.

The measurement model was first examined by considering the individual factor loadings of internal reliability, convergent validity, and discriminant validity. As per the recommended criteria, the factor loading value cut-off point was 0.7 and above (Hair Jr et al., 2016). Table 2 shows that factor loads ranged from 0.769 to 0.971, showing that each construct was significant. The reliability of the research data was investigated using Cronbach’s Alpha (CA) and Composite Reliability (CR). Our analysis reported that the values for CA ranged from 0.820 to 0.933, while

Table 1. Sample profile

Measure	Option	Frequency
Respondents demographics (N = 208)		
Gender	Male	126
	Female	82
	Total	208
Age (years)	Less 30	40
	30–40	153
	41–50	22
	Over 50	3
	Total	208
Education	PhD	4
	MSc	40
	BSc	159
	Diploma	5
	Total	208
Job title	Manager (CIO, CFO, business, etc.)	18
	Director and supervision	44
	Key-user (such as accountant)	103
	Engineer	17
	Analyst	18
	Missing	8
	Total	208
Experience in ERP system (years)	Less 2	13
	2–5	42
	6–10	137
	Over 10	16
	Total	208
Department	Accounting and finance	79
	Human resource	31
	IT	58
	Other (quality, marketing, risk management, etc.)	40
	Total	208
Banks demographics (N = 13)		
ERP vendors	SAP	3
	Oracle	6
	Intuit Inc.	1
	Other	3
	Total	13

(Continued)

Measure	Option	Frequency
Year of ERP implementation	Less 5	1
	5-10	6
	11-15	5
	Over 15	1
	Total	13
Number of employees	Less 500	4
	500-1000	4
	1001-2000	1
	Over 2000	4
	Total	13

Table 2. Factor loadings

Measurement item	Loading
System Quality (SQ)	
SQ1: The ES is stable	0.855
SQ2: The ES is easy to use	0.803
SQ3: The ES is user friendly	0.795
SQ4: The response time of ES is acceptable	0.769
Information Quality (IQ)	
IQ1: The information provided by ES is accurate	0.905
IQ2: The Information provided by ES is always timely	0.893
IQ3: The Information provided by ES is useful	0.933
IQ4: The Information provided by ES is easy to understand	0.885
Service Quality (SV)	
SV1: I receive prompt service from the IT department	0.795
SV2: The information I receive from the IT department is accurate	0.924
SV3: The IT department solves my problems	0.971
SV4: Training provided by the IT department improvise my work quality	0.945
Perceived Usefulness (PU)	
PU1: The ES improves my work quality	0.900
PU2: The ES increases my productivity	0.921
PU3: The ES enhances my effectiveness in my work	0.778
PU4: Overall, I find the ES useful in my work	0.895
User Satisfaction (US)	
US: I am satisfied with the system quality	0.864
US2: I am satisfied with the information quality	0.912
US3: I am satisfied with the service quality	0.875
US4: Overall, I am satisfied with the ES	0.814

Table 3. Construct reliability and validity results

Construct	CR	CA	AVE
System quality	0.881	0.820	0.650
Information quality	0.947	0.926	0.818
Service quality	0.951	0.933	0.830
Perceived usefulness	0.929	0.897	0.766
User satisfaction	0.924	0.890	0.752

Table 4. Discriminant validity results

Construct	1	2	3	4	5
1. IQ	0.904				
2. PU	0.741	0.875			
3. SQ	0.762	0.700	0.806		
4. SV	0.093	0.087	0.113	0.911	
5. US	0.668	0.816	0.643	0.074	0.867

Note: The bold values indicates to AVE square root.

Table 5. Results of R^2 and Q^2 values of the endogenous construct

Endogenous Construct	R^2	Q^2
Perceived usefulness	59.3	0.448
User satisfaction	67.9	0.498

Note1: $R^2 > 0.67$ substantial, 0.33 to 0.67 moderate, 0.19 to 0.33 weak & < 0.19 unacceptable.

Note2: $Q^2 > Zero$.

Table 6. Hypotheses testing results

Hypothesis	β	T- value	P-value	Support
H1: SQ \square PU	0.331	4.369	0.000	Yes
H2: SQ \square US	0.101	1.775	0.038	Yes
H3: IQ \square PU	0.497	6.691	0.000	Yes
H4: IQ \square US	0.086	1.392	0.082	Yes
H5: SV \square PU	0.062	1.525	0.064	Yes
H6: SV \square US	0.004	0.095	0.462	No
H7: PU \square US	0.682	13.812	0.000	Yes

Note: *, **, *** significance level of 0.1, 0.05 & 0.01, respectively.

CR ranged from 0.881 to 0.951, which means all values were higher than the acceptable 0.7 threshold (Hair Jr et al., 2016). Convergent validity was used to determine the correlation value of each latent construct. Average Variance Extracted (AVE) is the most popular test for convergent validity. The convergent validity for all constructs was achieved, meaning that they all had adequate convergent validity with all values above 0.50 as shown in Table 3. Conversely, discriminant validity was used to identify true reflective indicators, which are good indicators that correlate highly with their own constructs (Hair Jr et al., 2016). The Fornell-Larcker test was used to assess discriminant validity using AVE square values. Table 4 exhibits that the AVE square values

for each construct are higher than their correlations with other constructs, signifying adequate construct discriminant validity. Through the above, our constructs are safe to test using the structural model.

After measurement model assessment, the structural model must be assessed to determine the relevance and significance of path coefficients (Hair Jr et al., 2016). A bootstrapping procedure was run with 5000 resamples to test our hypotheses. The findings demonstrated that our hypothesized relationships were statistically significant except for H6. Another important test is the Determination Coefficient (R^2), which reflects the proportion of variance between endogenous constructs and exogenous constructs (W. W. Chin, 2010). As shown in Table 5, our proposed model explained 59.3 per cent of perceived usefulness variance and 67.9 per cent of user satisfaction variance, which are considered moderate and high, respectively, according to W. Chin (1998). Furthermore, Predictive Relevance (Q^2) was assessed to calculate the predictive power of our proposed model. As a rule of thumb, Q^2 values should be higher than zero to achieve predictive relevance for endogenous constructs (W. W. Chin, 2010). From Table 5, it can be seen that the Q^2 values were greater than zero, which means our model had enough prediction capability. Goodness of Fit (GoF) was assessed based on the geometric mean of the average communality and average R^2 (Tenenhaus et al., 2005). This research followed the criteria given by Wetzels, Odekerken-Schröder and Oppen (Wetzels et al., 2009) to determine the GoF value. Its score was found to be 0.6967, which is adequate and demonstrates a large model fit.

5. Discussion

One substantial issue that as of this time has remained unexplored is the satisfaction of ES users in Jordan. The goal of the current work was to explore the factors that impact the satisfaction of ES users who are operating in Jordanian commercial banks. As illustrated in Table 6, our research model propositions were empirically supported, except that the relationship between service quality and user satisfaction was insignificant.

Specifically, system quality significantly predicted usefulness ($\beta = 0.331$, $t = 4.369$, $p = 0.000$) and satisfaction ($\beta = 0.101$, $t = 1.775$, $p = 0.038$); hence, H1 and H2 were supported. These results contradict the findings of Chen et al. (2015) and are consistent with Seddon and Kiew (1996), who found system quality to be one of the most essential determinants for usefulness and satisfaction. A technically sound ES can fulfil user needs and have a positive influence on perceived usefulness. It can be argued that a high level of user performance and satisfaction needs optimal system performance, which can be achieved through easy to use hardware and software as well as systems free from fatal errors. In other words, system quality leads to enhanced user performance in terms of productivity and time saved on tasks, which increases their satisfaction

Another noticeable aspect of our findings was that information quality had a significant positive influence on perceived usefulness ($\beta = 0.497$, $t = 6.691$, $p = 0.000$) and ES user satisfaction ($\beta = 0.086$, $t = 1.392$, $p = 0.082$), which supports H3 and H4. Obtaining high-quality information from an ES improves user performance in terms of productivity and decision-making. If users receive incorrect, disorganized, and unrelated information, they may consider ES to be useless. In this sense, when ES provides high-quality information that is complete, accurate, up-to-date, and trustworthy, users will be satisfied with the information they obtained. Similar prior work results found that information quality is a useful predictor of usefulness (Rana et al., 2015; Sun & Mouakket, 2015) and user satisfaction (Chou & Hong, 2013; Cidral et al., 2018; Ouiddad et al., 2020). As expected, this study found that service quality has a strong effect on usefulness, which indicates that H5 ($\beta = 0.062$, $t = 1.525$, $p = 0.064$) was supported. Similarly, other researchers found a significant link between service quality and usefulness, such as Chen et al. (2013). This result indicates that users perceive good service in terms of responsive and reliable service that improves their performance and productivity. If users find ES dependable and responsive to their needs, they will perceive it to be useful.

Interestingly, service quality was not a significant factor influencing satisfaction; hence, H6 was not supported ($\beta = 0.004$, $t = 0.095$, $p = 0.462$). This result is aligned with several previous works where researchers did not find an influence of service quality on user satisfaction (Chen et al., 2015; Ouiddad et al., 2020). A potential reason for the lack of support for this relationship could be that users do not find IS service useful enough in terms of accuracy and promptness, thus making users feel dissatisfied with the provided services. Another possible reason could be the lack of technical training offered by the IS departments in developing countries where IT infrastructure is comparatively weak compared to developed countries. Hence, the link between service quality and user satisfaction should be further explored. A significant positive association exists between usefulness and satisfaction, supporting H7 ($\beta = 0.682$, $t = 13.812$, $p = 0.000$). This result emphasizes the theoretical observation of Seddon and Kiew (1996), who emphasized that perceived usefulness is a strong determining factor of user satisfaction. This result supports recent empirical works by Rezvani et al. (2017), Al-Jabri (2015), Abu-Shanab and Saleh (2014), and Sun and Mouakket (2015), who supported this relationship. It can be concluded that the improvement of an ES user's performance and productivity depends on their perception that the system is useful. Thus, when users perceive that the system is useful and valuable, their satisfaction will increase.

6. Conclusion and implications

Nowadays, organisations continue to invest in enterprise systems to enhance their performance. However, several organisations have failed to attain the intended organisational benefits as system users were not satisfied with these systems. Therefore, exploring the factors that influence ES user satisfaction is of high importance since it is complex and risky. To this end, we developed a theoretical model that integrated dimensions from ISSM and Seddon's model to explain the influence of system quality, information quality, service quality, and perceived usefulness on the satisfaction of ES users. The research results found that the key factors that influence user satisfaction were system quality, information quality, and perceived usefulness. The theoretical model proposed in this research is valuable to academics and practitioners attentive to successfully managing ES. From a theoretical point of view, our results suggest a number of implications.

First, this research contributes to the related academic literature by extending ISSM to explore antecedents of user satisfaction in the context of ES. Second, our proposed model provides insight into the critical role of perceived usefulness, supporting its inclusion in ISSM and its influence on user satisfaction. In this work, the system use dimension in ISSM was replaced with perceived usefulness from Seddon's model. These findings support the notion that perceived usefulness is a more meaningful and relevant dimension than the use dimension when usage is compulsory, such as for ES in Jordanian commercial banks. Third, our overall results are completely new to the literature and contrast some previous studies (Chen et al., 2013, 2015; Floropoulos et al., 2010). In particular, our findings show considerable support for the model propositions. Six out of the seven proposed hypotheses were found to be significant, and they explained 67.9 per cent of satisfaction variance. Thus, our findings contradict the inconsistent results of prior empirical works. Fourth, this research, unlike prior works of its kind, tested the factors that impact user satisfaction in a mandatory system use context instead of voluntary system use context such as e-tax and e-commerce (Chen et al., 2013; Floropoulos et al., 2010). Generally speaking, our findings bridge the research gap on mandatory ES system use.

Lastly, this study contributes to the growing body of knowledge about the critical success factors of ES implementation in developing countries such as Jordan. Even though enterprise systems are regarded as a critical investment in Jordanian commercial banks, they still present a challenge as they are expensive and complex. While user satisfaction is widely known to be a critical factor in ES success, understanding the factors that impact satisfaction may have essential implications for Jordanian banks. From a practical standpoint, our outcomes may assist professionals and developers in the successful adoption of ES in the future, especially in the Jordanian banking sector. Since if users do not perceive a system to be valuable and easy to learn and use, they may obstruct, delay, and sabotage the system. Therefore, policymakers should consider all factors and

issues that may influence ES user satisfaction and consequently reduce the risks related to high ES investments and encourage the creation of organisational benefits. In light of the obtained results, our current work presents insights for Jordanian commercial banks and their managers about the main factors determining ES user satisfaction, thereby contributing to system effectiveness and improvement. The results of this work are also useful in making ES consultants and vendors familiar with the challenges in preparing and implementing appropriate strategies to overcome these barriers.

7. Future research works

The authors call for further investigation in the Arab world or similar emerging economies to generalise these results. To validate our results, future works needed to test the factors that influence user satisfaction in a mandatory system context as there is an obvious dearth of works in this regard compared to the voluntary use setting. Since the posited relationship between service quality and user satisfaction is not supported by our research data, there is a need to further investigate this relationship. Furthermore, researchers could incorporate other success measures into our research model such as training quality. This is because if users do not obtain high-quality training, their perceptions towards a system are likely to be unstable, unrealistic, and remote. Eventually, future works may also employ other methods to investigate our model, for instance, a qualitative approach or longitudinal experimental study.

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