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THE IMPACT OF TASK TECHNOLOGY FIT ON ENTERPRISE SYSTEM SUCCESS

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Abstract

Previous research has consistently shown relationship between task-technology-fit and information system (IS) success for individuals, but little work has interested in this relationship at organizational level of analysis. This study investigated the role of task-technology-fit in Enterprise Resource Planning (ERP) success at firm level. The survey data were collected from 89 ERP-adopted enterprises being in Vietnam. PLS-SEM analyses supported the expected relationship between task-technology-fit and ERP success. Implications of this finding are discussed.

Keywords: Task technology fit, ERP system success, TTF theory

Introduction

In the last decades, business organizations have relied more on information and communication technologies to handle their day-to-day operations in an efficient manner. Enterprise Resource Planning (ERP) is one of the most popular forms of information technology (IT) among new IT for businesses. ERP is a packaged complex business software designed to integrate business processes and functions through using single database in order to be able to permit the sharing of common data and information in real time (Nah, Lau, & Kuang, 2001). Under the view of Callaway (1999), the ERP can provide a wide array of benefits that are both tangible (e.g., reduced personnel, inventory, IT and procurement, transportation, and logistic costs; improved cash flow management, revenue and profits) and intangible (e.g., increased visibility of corporate data, speed of decision making, and control over global business operations; improved customer responsiveness and business processes). Even Nicolaou and Bhattacharya (2008) pointed out that "firms which implement an ERP system must be conscious of and circumspect enough to realize that ERPs are different from other IT systems". They make firms' business processes and operational efficiencies change positively (Matolcsy, Booth, & Wieder, 2005; Nicolaou & Bhattacharya, 2008).

Because of advantages ERPs bring as mentioned above, even though they are expensive and complex systems, the market for the ERPs has been tremendously expanded in the fiercely competitive environment since its introduction in 1988 (Muscatello, 2003). For example, the revenue of the global ERP applications (including license, maintenance and subscription) have grew to approach nearly \$82.1 billion in

2015 and the top five ERP vendors sharing an approximately fifth of the whole market consist of SAP 6%, FIS Global 4%, Oracle 3%, Fiserv 3% and Intuit 2%¹.

However, regardless of majority of business organizations have achieved expected performance outcomes, a considerable number of enterprises still have not gained success from the implemented ERPs. Therefore, to help avoid ERP project failures, researchers, practitioners and academics are increasingly interested in analyzing factors determining ERP success. Ngai, Law, and Wat (2008), Ram and Corkindale (2014), Finney and Corbett (2007) and Al-Mashari, Al-Mudimigh, and Zairi (2003) concluded systematic reviews, and proposed a list of identified critical success factors (CSFs) in an ERP context. Among identified technological-related CSFs, it seems that fit between technology and tasks it supports is missing. Previous studies in the literature are critical concerning task technology fit and individual performance (Goodhue & Thompson, 1995; Kositanurit, Ngwenyama, & Osei-Bryson, 2006), however there are virtually no academic studies which examine the linkage between task technology fit and ERP success.

Moreover, there are many studies, which attempt to assess perceptions on CSFs and ERP success between different stakeholder groups (Ram & Corkindale, 2014). However, there are no studies examining perceptions regarding task-technology-fit and ERP success from the point of accountants' views. This study attempts to fill this gap. Accountants and accounting professions have been chosen in the present study because previous researches have shown that they are dramatically affected from ERP implementation (Newman & Westrup, 2005; Rom & Rohde, 2006; Scapens & Jazayeri, 2003).

The principal purpose of this study is to test the relationship between task technology fit and ERP success under accounting professions' perceptions. The results of this study will be of value to any companies regardless of whether or not they have implemented ERP systems. Specially, the research highlights the importance of the fit between technologies and users' tasks in explaining how technology leads to expected information system success in ERP context. Furthermore, the findings of the study will provide an empirical evidence to expand the list of technology-related CSFs in the ERP context.

The rest of this paper is organized as follows: Section 2 starts with a review of previous research in relation to the phenomenon being studied and proposes a research hypothesis. Section 3 present and describes the research methodology. Section 4 reports and analyses the results of this study. Finally, the paper concludes with a summary, several particular limitations addressed and directions for future research.

Literature review and hypothesis

ERP system success

There are limited research that have concentrated on measuring success of an ERP system (Mukti & Rawani, 2016). Therefore, on the ground that ERP system is a kind of information system, this paper attempts to review all popular measurements of IS and ERP system success available in the literature.

¹ These figures are quoted from the Allert Pang's report (June 28th 2016) that is posed on website Apps Run The World.

Retrieved May 20, 2017 from <u>https://www.appsruntheworld.com/top-10-erp-software-vendors-and-market-forecast-2015-2020/</u>

A review of IS success shows the variety of definitions of IS success². Some of them are summarized in **Table 1**. Accordingly, there does not exist a particular formal definition to the phenomena of IS success. Each kind of stakeholders has a different definition about the IS success in an organization (Grover, Seung Ryul, & Segars, 1996; Ifinedo, 2011). For instance, from the point of the system developer's perspective, the IS success is achieved when IS project is completed on time, under budget, functions correctly. For customers/ users, an information system is successful if it improves user satisfaction or performance (Guimaraes & Igbaria, 1997). From the organizational perspective, IS success contributes to the company's profits or creates the competitive advantages. In addition, it should be noted that IS success also depends on the type of system to be evaluated (Seddon, Staples, Patnayakuni, & Bowtell, 1999).

Table 1: Some definitions of IS success						
Authors	Definition					
Lucas Jr (1978, p. 29)	"Because of the extreme difficulty of measuring					
	implementation success through cost/benefit					
	studies, some other indicator of success is needed. The most appealing indicator for this purpose from					
	a measurement standpoint is system use"					
Gatian (1994, p. 119)	"If an effective system is defined as one that					
Cation (1993) pr 1197	adds value to the firm, any measure of system					
	effectiveness should reflect some positive change in					
	user behavior, e.g., improved productivity, fewer					
	errors or better decision making"					
Rainer Jr and Watson	"An EIS ³ should be developed in response to a					
(1995, p. 84)	specific business need, such as a need to be more					
	responsive to changing customer desires, to improve product quality, or to improve					
	improve product quality, or to improve organizational communications. Systems that do					
	not support business objectives are unlikely to					
	succeed"					
Bailey and Pearson	"Measuring and analyzing computer user					
(1983, p. 530)	satisfaction is motivated by management's desire to					
	improve"					
Byrd, Thrasher, Lang,	" the effects of IS along a path can lead to					
and Davidson (2006, p.	better organizational performance, in this case,					
448) Goodhue and	lower overall costs" "MIS ⁴ success ultimately corresponds to what					
Thompson (1995, p. 213)	DeLone & McLean label individual impact"					
- momp30n (1993, p. 213)						

However, this current study will focus the IS success measurement conceptualizations that drew from DeLone and McLean (1992). As the DeLone and McLean IS success model provides a schema for categorizing the various IS success

² Most of the following section in relation to IS success are quoted from the study of Thanh D. Nguyen, Nguyen, and Cao (2015)

³ EIS: Executive information system

⁴ MIS: Management information system

measures (Ifinedo, 2011) and their framework have widely been used to assess the effectiveness or success of IS at the organizational level (Petter, DeLone, & McLean, 2008).

In the context of ERP applications, Sedera and Gable (2004) developed an enterprise system success measurement model that redefines the DeLone and McLean IS success model. Through multi-stage data collection and statistical analysis, these researchers eliminated the Use and User satisfaction dimensions in the original DeLone and McLean IS success model. Accordingly, ERP system success is second order variable that is identified, described, and explained through four first order factors including information quality, system quality, individual impacts and organizational impacts (Sedera & Gable, 2004).

Task technology fit (TTF)

Goodhue and Thompson (1995) propose and empirically test a comprehensive task technology fit theoretical model. Their framework is to assert positive impacts of information technology on individual performance, namely: technology (1) must be utilized and (2) must be a good fit with tasks it supports. Task technology fit construct in their model refers to *"the degree to which a technology assists an individual in performing his or her portfolio of tasks"* (Goodhue & Thompson, 1995, p. 216).

However, the original TTF theory explains fit between technology and tasks it supports in terms of individual attitude and intention, but a little research addresses the phenomenon that has been studied at the organizational level. The present research adopts the concepts of task technology fit applied in the organizational context. This approach is similar to what Tho D. Nguyen (2007) concludes in his study. Accordingly, task technology fit in this context is defined as the degree of matching or alignment between the capabilities of an ERP system and the demand of tasks that must be performed to achieve desired organizational goals.

Task technology fit and enterprise system success

According to DeLone and McLean (1992), one of salient outcomes of interest to IS researchers is the performance benefits that is provided by utilization of an information system. In accordance with this thinking, TTF theory and its extensive applications offer that task-technology fit is antecedent of performance impacts at multiple levels of analysis (Furneaux, 2012). As such, it is well-positioned to provide a comprehensive understanding of the value of information systems and how this value is derived.

However, adopting this theory in previous studies has existed several issues. In relation to unit of analysis and kind of research design, most of survey researches have typically focused to investigate the linkage between task technology fit and performance impacts from individuals' perspectives while experimental works have conducted at the individual, and group, or team level (Furneaux, 2012). There are no survey studies that assess this relationship at organizational level of analysis. In addition, previous studies attempt to measure task technology fit and performance impacts level among users from different departments (Furneaux, 2012). There are no academic papers that focus to investigate these variables of interest from one of principal stakeholders – accounting profession who are too considerably affected to not change their role and even nature (Newman & Westrup, 2005). Furthermore, the last dependent variable in the TTF theory is performance impacts which are mentioned in literature as individual impacts (Tam &



Oliveira, 2016), user satisfaction (Staples & Seddon, 2004), decision efficiency or decision quality (Jarupathirun, 2007)... without information system success. Thus, this study, which aims to fill gaps of previous TTF researches, is based on investigation of linkage between task technology fit and system success in the ERP systems context. To this end, we propose the following:

H: Task technology fit has a positive influence on ERP system success.

Research methodology

Sample frame

Our target population is current business organizations adopting the ERP systems in Vietnam. The key informants are chief financial officers, accounting-related managers working in enterprises of interest.

Measures

All research constructs included in this study have multi-item scales derived from relevant literature. Each item in the survey employed a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree).

Task technology fit is measured by using a 6-item scale adapted from Goodhue (1998). Changes in task technology fit cause changes in each item measuring it; as a result, the measure of task technology fit is operationalized as reflective construct in this study.

ERP system success is second-order construct measured with four first-order components including information quality, system quality, individual impacts and organizational impacts (Sedera, 2006; Sedera & Gable, 2004). This instrument is tested and defined as a reflective-reflective construct (Sedera & Gable, 2004).

Data collection

To test this hypothesis, a questionnaire is designed to collect data. Each of items in the questionnaire in relation to two variables mentioned in the hypothesis is reviewed for content validity by an expert panel that has a high level of knowledge and skill relating to ERP systems. The initial questionnaire is piloted on ten respondents randomly selected from the sample frame and then revised on the basic of their responses.

This study utilizes email survey to collect data. However, there is no data available on the contact details of chief financial officer or managers in relation to accountingrelated departments working in all ERP-implemented business organizations in Vietnam. As it is extremely difficult to obtain this type of data, a convenience-sampling method is used. A list of email addresses consisting of 3853 potential informants is built up from public sources such as Vietnamese Business Directory, Vietnam Panpages and personnel relationship of authors such as master students, alumni of the university that authors are employing. After three months between the beginning of September of 2017 and the 30th of November, 98 answers are received. The response rate is low, approximately 2.5% since the number of enterprises adopting the ERP systems in Vietnam is still not popular⁵. Among these responses, nine are found incomplete, and 89 are considered valid. All official responses are enterprises adopting the ERP systems for at least one year.

⁵ This information is quoted from Vietnamese e-commerce index report proposed by Vietnam E-commerce Association.

Retrieved March 17, 2018, from <u>http://ebi.vecom.vn/Upload/Document/Bao-Cao/Bao-cao-EBI-2017-Final.pdf</u>

To test the common method bias of the 89 responses, the marker variable technique is employed (Lindell & Whitney, 2001). No significant common method bias is found in the data set.

Data analysis, results and discussions

Our hypothesis, which includes the second-order construct, consists of ERP system success that is modeled as causally impacting four first-order factors. Therefore, ERP success is not directly connected to any measurement items. PLS allows the conceptualization of higher-order factors through the repeated use of manifest variables (Tenenhaus, Amato, & Esposito Vinzi, 2004). A higher-order factor can thus be created by specifying a latent variable, which represents all the manifest variables of the underlying lower-order factors. We use PLS approach because of the limitation of valid sample size and the desire to analyze second-order construct. Data is analyzed in two stages involving a PLS technique using Smart PLS software (Hair Jr, Sarstedt, Hopkins, & G. Kuppelwieser, 2014).

Assessment of the measurement model

In order to assess the measurement model, reliability, convergent validity and discriminant validity of each measurement scale are estimated.

Construct reliability measures the stability of the scale based on an assessment of the internal consistency of the item measuring the variable. All reflective constructs in our hypothesis shown in **Table 2** have a composite reliability (CR) over the cutoff of 0.7, as suggested by (Fornell & Larcker, 1981), implying high internal consistency.

Convergent validity is assessed and indicated through the t-statistic for each factor loading. All factor loading in **Table 2** are greater than the typical cutoff value of 0.5 (Hair Jr et al., 2014) and significant at the p< 0.001 level. Thus, this asserts that all current constructs achieve convergent validity.

Discriminant validity measures the extent to which different constructs diverge from one another. In **Table 3**, the diagonal elements represent the square root of Average Variance Extracted (AVE), providing a measure of the variance shared between a construct and its indicators. The constructs used in the hypothesis have the square root of AVE larger than correlations between constructs, therefore, they meet discriminant validity (Fornell & Larcker, 1981).

Table 2: Reliability and convergent validity of reflective constructs									
Indicators	Cronba	rho_	Compos	AVE					
	ch's Alpha	А	ite						
			Reliability						
ESS	0.944	0.95	0.950	0.505					
		0							
II	0.919	0.92	0.942	0.804					
		0							
IQ	0.897	0.89	0.922	0.663					
		9							
OI	0.892	0.92	0.918	0.604					
		6							
SQ	0.855	0.85	0.887	0.501					
		7							
TTF	0.975	0.97	0.980	0.890					

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	Table 3: Discriminant validity									
	ESS	II	IQ	01	SQ	TTF				
ESS	0.658									
II	0.785	0.896								
IQ	0.839	0.510	0.814							
OI	0.856	0.690	0.538	0.777						
SQ	0.863	0.513	0.761	0.593	0.705					
TTF	0.813	0.667	0.676	0.634	0.757	0.944				

Result of hypothesis testing

The results of the structural model is shown in **Figure 2**. Our hypothesis offers adequate explanatory power, with R-square value 66.1%. We find that task technology fit has significantly influenced ERP system success ($\beta = 0.813$, p < 0.001). It means that the match or congruence between system capabilities and the requirements of the tasks helps to achieve organizational goals as well as allow enterprises that ERP systems support to operate smoothly and efficiently; as a result, desired organizational outcomes may be considerably enhanced. Thus, H is supported.

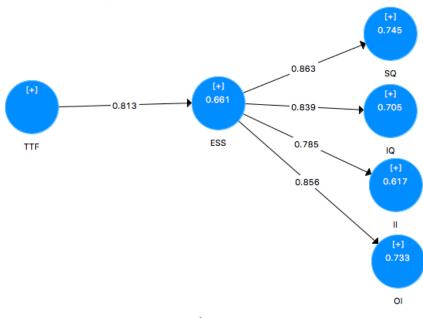
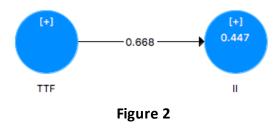


Figure 1

Alternative hypothesis

To further understand how our proposed hypothesis may increase explanatory power in an ERP context, this study extensively tests the original path of TTF theory in relation to the impact of task technology fit on individual performance with the same data set. To put it differently, we replace ERP system success with individual performance, which is defined as the extent to which the information system has influenced users' capabilities and effectiveness (Gable, Sedera, & Chan, 2003; Sedera & Gable, 2004). Figure 3 confirms that task technology fit is also positively associated with individual performance with the explanatory power on it is only 44.7% however, in the hypothesis of the current study, 66.1% of the variance in ERP system success is explained.



The results obtained from above two hypotheses clearly demonstrate the importance of task technology fit for an implemented ERP system. The matching between features an ERP system's technology provide with tasks required not only leads to increase in user capabilities and effectiveness but also plays an extremely significant role in explaining its success. It can be said that task technology fit is considered as a critical success factor in ensuring an ERP system achieving desired organizational goals. Given expectation that advanced technologies should provide adequate support for successful outcomes and based on findings of this study, obviously, business originations should be increasingly interested in selecting ERP software meeting a requirement that its technology must be a good fit with tasks it supports.

Conclusions and implication for research

Implications for research

Building on the TTF theory, this study proposes and tests the relationship between task technology fit and performance impacts, however, in an extensive way. In simpler terms, this study contributes to the literature by filling existing gaps in relation to TTF research. Specifically, original TTF theory adopts individual impacts as surrogates of IS success while the current study directly investigates the impact of task technology fit on ERP system success. In addition, we assess the phenomenon from the point of accounting managers' view. It could bring a better explanation for the importance of task technology fit because accountants is considered as multi-role persons who directly enter input as well as who directly utilize system output to make decision timely. Therefore, their perspectives about fit between technology and task are more appropriate, complete and accurate. Finally, also the most importance, we analyze the current phenomenon at organizational level that has not yet concluded before.

Implications for practice

This study provides valuable experience in relation to system success in the ERP environment for managers. They realize that operational and strategic effectiveness can be achieved and enhanced if an ERP system's technology matches with tasks it supports. Hence, in terms of enterprises without ERP systems, they must pay more their attention to selecting an ERP system that meets such 'fit' when having intention to adopt an ERP system. For ERP-implemented organizations, they should be mindful of reaching an agreement with ERP vendors on maintaining ERP systems in order to remain such 'fit' as much as possible. Second,

Limitations



Our findings should be considered in light of a few limitations. First, our sample includes 89 respondents, of which 30% percent are enterprises, which are in implementation stage and 70% percent in post-implantation. Task technology fit may change in different stages of ERP lifecycle so its impacts on ERP system success may be influenced. Future studies may consider investigating whether difference exists between implementation and post-implementation stage to provide a more comprehensive evaluation in relation to the current phenomenon. Second, due to time and budget constraints, the measurement scales adopted in this study are originally developed in the context of Western countries. This may not truly reflect the nature of the study's construct in the context of Vietnam. As a result, the results of the current study may be affected because of potential measurement bias. This problem could have been mitigated if the scales had been more extensively augmented by additional explored items and tested qualitatively prior to the field survey.

Conclusions

The present study provides an empirical proof about the positive impact of task technology fit on ERP system success. Understanding this relationship is crucial because ERPs are increasingly widely adopted in Vietnam and because most firms have gone beyond the pre-implementation stage. Thus, firms should shift their focus on choosing an ERP system meeting a good 'fit' between technology and task it support in order to receive the desired outcomes from their huge investments.

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