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Determinants of Outsourced ERP Implementation Success: Effects of the Task-Technology Fit Theory and Partnership Quality Perspective

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Abstract
Many companies outsource parts of their ERP systems, drawing researchers' attention and driving them to investigate how companies successfully outsource their ERP systems. This study integrates factors from the task-technology fit theory (task characteristics, technology characteristics, utilization, and performance impacts) and from the partnership quality perspective (skills and knowledge, experience, responsibility, user involvement, and partnership quality) to examine their effects on the success of outsourced ERP system implementation in terms of performance outcomes and user satisfaction. It uses a survey for data collection and the structural equation modelling (SEM) method for data analysis. The results indicate that task-technology fit (influenced by task interdependence) affects system utilization and performance outcomes which in turn influence user satisfaction. Moreover, partnership quality (influenced by users' skills and knowledge, user involvement, and vendor responsibility) affects task-technology fit, system utilization and user satisfaction. The results also show that task-technology fit and partnership quality affect the success of outsourced ERP system implementation. Partnership quality has a greater effect on user satisfaction, whereas task-technology fit has a greater effect on performance outcomes. This study fills the gap in the system implementation success literature by integrating the task-technology fit theory and partnership quality perspective to explain the success of outsourced ERP system implementation. It also provides guidance for clients and vendor organizations on what could be done to enhance users' performance and satisfaction.

Keywords: Task-Technology Fit, Partnership Quality, ERP, Implementation Success, Outsourcing, User Satisfaction.

1. Introduction

Today, enterprise resource planning (ERP) systems are widely used by all kinds of enterprises, including small ones, and across most sectors (Aremu, Shahzad, & Hassan, 2018; Alhuthaifi, 2018; ArcherPoint, 2019). Many companies used ERP systems to support their operational processes by creating, modifying, storing and distributing information, and manage their business processes across organizational units effiectively (DeHondt & Knapp, 2008). A number of previous studies contend that companies outsourcing their system implementation process enjoy cost savings, goal achievement, and competitive advantages (e.g. Patel, Lawson-Johnson, & Patel, 2009; Philip, Wende, & Schwabe, 2013; Artelogic 2019; Cybrosys 2019). An ERP system, however, is a complicated technology that requires a high level of expertise to configure and manage it to fit an organization's objectives effectively. This largely accounts for the failure of outsourced ERP system implementation in small and medium-sized companies (SMEs) (Pinto & Slevin 1988; Sammon & Adam, 2010; Fox & Vaidyanathan, 2017; Rouhani & Mehri, 2018; Artelogic 2019; Cleveroad 2019). Many studies attempt to understand how companies successfully outsource their ERP system

implementation (e.g. Shrinivas & Wongsurawat, 2015; Artelogic 2019). Some have applied the task–technology fit (TTF) theory to explain the success of technology implementation in relation to system performance impacts (Sammon & Adam, 2010; D'Ambra, Wilson, & Akter, 2013; Tam & Oliveira 2016). The TTF theory posits that a technology should be used only if its capabilities are suited to the tasks that users must perform and if it is compatible with the existing system. (Goodhue & Thompson, 1995; Wu & Chen, 2017; Ratna et al., 2018). TTF is based on two key determinant factors; task characteristic and technology characteristic. Since the ERP system is complex as it covers all functions, integrates various business processes (Althonayan & Althonayan, 2017) and is operated by users from different business units, task interdependance (task characteristic) and user interface design (technology characteristic) are important factors for ERP system implementation. In the outsourcing context, the partnership between clients and service providers is a key determinant factor of the outsourcing success in terms of system implementation (Lee & Kim, 1999; Ali & Karn, 2014; Lee & Choi, 2003; Rhodes et al., 2016).

The higher the quality of the partnership, the higher the success of the system implementation (Lee & Kim,1999). In their study, Lee and Kim (1999) integrate partnership quality with TTF to explain how both are related and affect the success of outsourced ERP system implementation. Previous studies indicate that partnership quality leading to successful project implementation is determined by the individual characteristics of both parties, including users' skills and knowledge, user involvement, vendor experience, and vendor responsibility (DeHondt & Knapp 2008; Patel et al., 2009; Philip et al., 2013). Also, Teng and Hsu (2017) concluded that external service providers or outsourcing companies who possess the right resources, innovativeness, and skills significantly impact system implementation success. This study aims to understand how TTF and partnership quality are associated to account for the success of outsourced ERP system implementation. More specifically, it examines the effects of TTF and its two determinant factors (task interdependence and user interface) and partnership quality and its four determinant factors (user skills and knowledge, user involvement, vendor experience, and vendor responsibility) on the success of outsourced ERP system implementation as measured in terms of user performance and satisfaction. This study adds to the knowledge of system implementation success in IS literature in that it provides an understanding of how the integration of TTF and pernership quality affects the success of ERP system implementation. It also offers guidance to clients and vendor organizations as to what factors should be monitored and managed to enhance user satisfaction and performance when implementing outsourced ERP systems.

2. Theories Underpinning the Research Model

- Task-Technology Fit and its Determinants

Task-Technology Fit (TTF) is a broad concept. A broad and most agreeable definition is that TTF refers to the alignment between the demands of the tasks that must be done and the capabilities of an information technology (Goodhue, 1995). Many studies have examined the effects of TTF on individual and team performance with various technologies (e.g., Goodhue & Thompson, 1995; Fuller & Dennis 2009; Tam & Oliveira, 2016). Goodhue and Thompson (1995) used TTF to explain performance impacts and proposed a simplified TTF model that describes a fit between the capabilities of a technology and task characteristics. Their TTF model consists of five key factors: (i) task characteristics, (ii) technology characteristics, (iii) task-technology fit, (iv) utilization, and (v) performance benefits (Goodhue & Thompson, 1995).

(i) *Task characteristics* in this simplified model pertain to users' actions turning inputs into outputs related to information technology (Goodhue & Thompson, 1995). Various tasks

(e.g., task interdependence, task equivocality, etc) can be accomplished by different technologies (e.g., mobile technology, social network, cloud computing). Although a variety of tasks can be handled by an ERP system, Goodhue and Thompson (1995) focus on task interdependence, which is the main purpose of many organizations (they adopt the ERP system to handle tasks across business units). Task interdependence commonly refers to the extent to which an ongoing task associates with other tasks and work units. It expands the degree to which workers interact with and rely on others to accomplish their works (Gebauer, Gustafsson, & Witell, 2010).

(ii) *Technology characteristics* are broadly focused on the identification of information systems such as functionality and user interface design (Lee & Kim 1999; Yuan et al., 2010). These studies focus on one of the most important system features, user interface (UI), that allows users to directly interact with the system devices or applications. UI refers to user-friendly navigation structure, search function, form arrangement, ease of access, graphical interface, a user's integration of software with other applications, ease of creation, and storage and retrieval information (Alexander, Koufaris, & Hess, 2012; Gebauer et al., 2010; Ishengoma, Leonard, & Hector, 2018 ; Park, 2018).

(iii) *TTF* describes the match between the demands of a task and the technology capabilities to support the task achievement (Goodhue, 1995). A technology that has a good fit with the task will perform better than a technology that poorly fits with the task (Fuller & Dennis 2009; Ishengoma et al., 2018). A fit is viewed as a normative construct that matches the capabilities of a technology and the task requirements (Goodhue, 1995). Many survey-based TTF studies measure fit directly rather than through constructing fit measures from other variables (Vongjaturapat, 2018).

(iv) *Utilization* is the individual behavior of using the technology in completing his or her tasks. It can be measured by frequency of use, length of time, and the diversity of applications employed (Davis, 1989). Goodhue and Thompson (1995) define utilization as the beliefs of using a system and contend that TTF is an important factor in identifying whether a technology is believed to be more useful, more important, or relatively more advantageous. Previous studies have tested and confirmed a positive relationship between TTF and utilization (e.g. Goodhue & Thompson, 1995; Dishaw & Strong, 1999; Aldhaban, 2016).

(v*) Performance benefit*s are realized when the required task can be completed with the help of an appropriate technology (Goodhue, 1995). It can be defined broadly as the use of information technology to improve efficiency, effectiveness, or work quality. It refers to the impact of computer systems and services on users' productivity, effectiveness, and performance (Goodhue & Thomson, 1995).

- Partnership Quality Perspective

Partnership quality is among the most important factors driving the success of outsourcing implementation. The term "partnership" is often used interchangeably with the term "relationship" (Grover, Cheon, & Teng, 1996; Lee & Kim, 1999). Information technology outsourcing (ITO) partnership can simply refer to a state of connectedness between clients and suppliers in an ITO arrangement. Partnership can reduce the opportunism from each party and the risk of inadequate contractual provisions. It becomes an actual challenge for many organizations as the relationship between service providers and clients evolved from a contractual relationship to a more preferred strategic partnership (Lee & Kim, 1999; Grover et al., 1996). Partnership quality refers to the overall assessment of the strength of a relationship between two parties (Grover et al., 1996). The quality of the relationship between a vendor and its customers determines the probability of continued future interchange

between those parties. Lee and Kim (1999) defined partnership quality in relation to how well the outcome of a partnership matches each partner's expectations. A successful partnership positively affects customer perceived value (Rhodes et al., 2016). Applying the social exchange theory and power-political theory, they proposed and tested a partnership quality model and concluded that partnership quality is a key influential factor of outsourcing success.

- Dimensions and Determinants of Partnership Quality

Previous studies identified the measurement of partnership quality from different attributes. Lee and Kim (1999) found that interaction, communication, participation and information sharing significantly affect partnership quality. Lee and Choi (2003) argued that a good partnership quality stems from how much a client involves itself in knowledge transfer and hence have more trust in vendors. Lee and Kim (2003) found that conflict, cooperation and trust affect the interaction and efficiency outcomes of an outsourcing arrangement. In addition, Ali and Karn (2014) pointed out that an effective partnership management involved managing relationships and internal activities, collaborating with and learning from the partner, and learning about the partnership and making adjustments. They asserted that the most important task in managing the partner relationship was good communication; an important factor to resolve issue of relationship failure. Hammake (2019) determined that a vendor can better meet client expectations and understanding client needs and wants. Many studies examined the factors influencing partnership quality. They include experience, skills and knowledge, user involvement, responsibility, top management, support, vendor support, project champion, management commitment (e.g. Grover et al., 1996; Lee & Kim 1999; Mohr & Spekman 1994; Lee & Kim 2003; Swar et al., 2012). Four of these factors, the most widely cited in prior literature, namely, (i) user involvement, (ii) users' skills and knowledge, (iii) vendor responsibility, and (iv) vendor experience are used in this study.

(i) *User involvement* refers to the overall willingness of users to be involved in activities from the beginning to the end of a project. This includes initiating the project, establishing project objectives, determining user requirements, identifying sources of data/information, outlining information flow, developing input and output forms/screens, and determining a system (Karimi, Somers, & Summer, 2007; Gebauer et al., 2010).

(ii) *Skills and knowledge* can be broadly defined as users' capabilities to manage IT projects in the current business environment, understand the functionalities of IT applications, or quickly learn and apply new technologies (Mohr & Spekman 1994; DeHondt & Knapp 2008; Patel et al., 2009). Lee and Kim (2005) argued that users' skills and knowledge can be viewed as users' expertise in the specific application areas of the system and as their ability to apply their expertise to complete a task requirement effectively.

(iii) *Vendor responsibility* broadly refers to a vendor's willingness to help customers and provide prompt services (Grover et. al., 1996; Lee & Kim 1999; Philip et al., 2013). It can be seen as the vendor's ability to ensure the availability and performance of the services provided to clients.

(iv) *Vendor experience* is the degree to which vendor professionals have technical skills, knowledge, and experiences about technology functionalities used in the client's business (Lee & Kim, 1999; Lee & Kim 2005; Swar et al., 2012). Many researchers have argued that experience, professional technology training, and skills and knowledge about systems play a vital role in the success of outsourcing implementation (Lee & Choi 2003; Patel et al., 2009). The ERP system implementation is a complex and requires in-depth experience and knowledge of vendors to deal with (Sammon & Adam, 2010).

- A Gap in Previous Literature

As mentioned earlier, many studies have applied the five dimemsions of the TTF theory to explain the implementation success of various systems, including ERP systems (Althonayan & Althonayan, 2017), mobile commerce (Rivera, & Van der Meulen, 2014; Rivera, Croes, & Zhong, 2016 ; Tam & Oliveira, 2016 ; Ratna et al., 2018) and social networks (Dang et al., 2018). However, there is a lack of understanding on how the TTF theory accounst for the success of system implementation in the outsourcing context, in particular the success of outsourced ERP system implementation. In addition, some studies have applied only four of the partnership quality factors (user involvement, users' skills and knowledge, vendor responsibility and vendor experience) to explain the outsourcing success of various systems such as ERP systems (Jain & Khurana, 2016) and project management (Latif et al., 2018). Most studies, however, do not take into account the task and technology characteristics when seeking to explain outsourcing success. This study seeks to fill this gap in previous literature by integrating the TTF theory and the partnership quality perspective to explain the success of ERP system implementation in the outsourcing context.

3. Hypotheses Development and Research Model

- Factors Influencing the Task-Technology Fit (TTF) and Partnership Quality

User interface (UI) helps users to link information across other systems/applications, easily use the menu bar, and write the query to generate a complex transaction which no effect to represent the outputs (Ko et al., 2008; Ishengoma et al., 2018). It also provides users with the ability to interact (input and retrieve data) with the system and perform their required tasks easier. For instance, the ERP system consolidates data from various operational units to the centralized database and provides user interface that enables inventory staff to view a stock inquiry easily on their mobile devices. Thus, user interface enables a system to support users' required operation manner. In other words, it makes technology fit users' tasks.

H1: *User interface has a positive effect on TTF*

In today's competitive market, task interdependence providing data sharing across organizational units is necessary for business's strategic planning (Stark, Bierly, & Harper, 2014). It involves a huge amount of data, cross-communication between organization's units, and data transaction throughout an organization, which must be managed. The major purpose of an ERP system is to integrate applications for business operations and business process activities across organizational units (Karimi, Somers, & Summer, 2007; Davenport 1998). Task interdependence, therefore, suitably fits the ERP system and influences the task-technology fit.

H2: *Task interdependence has a positive effect on TTF*

User involvement is a crucial part of the outsourced ERP system implementation process (Jain & Khurana, 2016). The ERP system contains various functions and applications that require users' information by the vendor's project team. User's overall willingness to participate is necessary for the vendor team to carry out the system implemenation efficiently. User involvement therefore promotes communication and collaboration between users and the vendor project team leading to a partnership quality.

H3: *User involvement has a positive effect on partnership quality*

The ERP implementation process needs to integrate work processes across departments but users may not understand the work processes in other departments. This makes it difficult for the vendor's project team to obtain the required and useful information necessary for a successful the system implementation (Ooi, Hasliza, & Ramayah, 2013). The vendor's project team will face a problem communicating and collaborating with users who lack the required knowledge and skills in the ERP system. On the other hand, users' skills and

knowledge in outsourced tasks will help to support efficient collaboration and communication with the vendor's project team leading to the improvement of the partnership quality.

H4: *User's skills and knowledge have a positive effect on partnership quality*

In the outsourcing implementation process, vendors should hold direct responsibilities (doing the core tasks assigned in the contract) and indirect responsibilities (doing associated tasks to complete the core tasks) in carrying out the outsourcing project. For long-term outsourcing contracts (e.g., ERP system implementation), vendors are responsible for not only doing the tasks specified in the contract but also developing relationship with clients/users (Mohr & Spekman, 1994). Previous studies suggested that vendors should have sympathy and be service minded and responsive to create an environment conducive to relationships and complete their contractual tasks smoothly (Mohr & Spekman, 1994; Lee & Choi, 2003). Vendor responsibility will therefore enhance collaboration between vendors and users. The higher the vendor responsibility, the better the partnership quality.

H5*: Vendor's responsibility has a positive effect on partnership quality*

Vendors who have experience implementing similar outsourcing projects will have more knowledge about the client's business process and understand specific applications of his/her outsourced system. This makes it easier for vendors to understand a client's requirements and develop the system to meet the client's needs (Jain & Khurana, 2016). In addition, vendors are able to provide useful advice and effectively solve problems for clients based on the experience they gain from doing the same project over and over. As a result, a vendor's experience enables effective communication and collaboration with users leading to the improvement of the partnership quality.

H6*: Vendor's experience has a positive effect on partnership quality*

- *Effects of TTF and Partnership Quality on the Success of ERP System Implement*tation

To successfully outsource the system implementation, users and a vendor's project team need to have good collboration to ensure a fit between the technology developed by the vendor and the users' tasks (Alghamdi, 2018). In other words, partnership quality (a manifestation of good collaboration) is necessary to secure a task-technology fit in the outsourced system implementation process.

H7*: Partnership quality has a positive effect on TTF*

In the outsourcing implementation process, a vendor is responsible for not only performing tasks specified in the contract but also for developing relationship with clients/users (Mohr & Spekman, 1994). Partnership quality as part of an effecicient collaboration will facilitate and improve the users' utilization of the system. This study argues that the better the partnership quality, the more the system utilization.

H8*: Partnership quality has a positive effect on utilization*

In many cases, after utilizing the implemented system, contingent issues arise and need to be solved quickly. An effective collaboration and a good support from a vendor (a manifestation of partnership quality) are essential and enhance user satisfaction positive effect on utilization (Wang, Sasanipoor, & Wang 2018). This study argues that partnership quality positively influences overall user satisfaction with the system implementation.

H9*: Partnership quality has a positive effect on user satisfaction*

A task-technology fit indicates the extent to which the system (technology) is compatible with the required tasks resulting in the actual system utilization (Dishaw and Strong, 1999). Users are more likely to use a system that can perform their tasks better. The ERP system consists of many applications (modules) that can be configured to support a variety of users'

task modes. The fit between the system and the users' tasks, therefore, enables system utilization.

H10*: TTF has a positive effect on utilization*

Technology that can support users' tasks has an impact on users' performance (Goodhue & Thompson, 1995; Ghiyoung, 2014). The ERP system, if appropriately configurated for users' tasks, will enhance users' productivity and quality of works. This study therefore asserts that TTF impacts users' performance outcomes.

H11*: TTF has a positive effect on performance outcome*

Utilization of the system through daily operational process will increase an individual performance in relation to efficiency and effectiveness (Goodhue & Thomson, 1995; Ghiyoung, 2014). This study proposes that system utilization enables favorable users' performance outcomes.

H12*: Utilization has a positive effect on performance outcome*

User satisfaction and performance outcomes should be measured periodically to evaluate ERP system performance (Batada & Rahman, 2012). A number of previous studies have investigated and confirmed the effect of system performance on user satisfaction (e.g., Batada & Rahman, 2012; Wei, Liou, & Lee, 2008). The more users can use a system to perform their tasks, the more they tend to be satisfied with the system. Accordingly, this study hypothesizes that the performance outcome affects user satisfaction.

H13*: Performance outcome has a positive effect on user satisfaction*

In summary, based on the integrated effects of the TTF theory and partnership quality perspective, the factors influencing the outsourced system's implementation success can be hypothesized as follows:

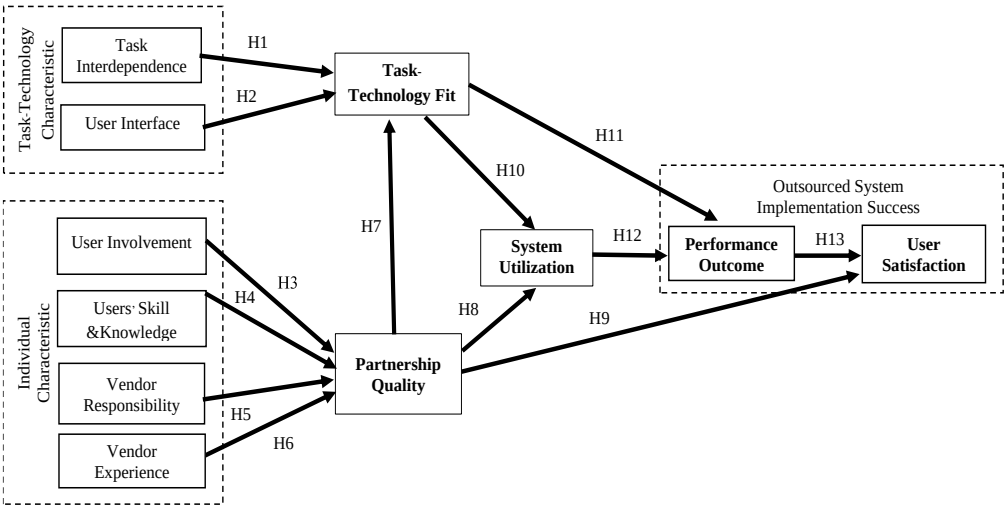

Figure 1: Research Model (Created by the Author for this Study)

4. Methodology

This study used a survey method; an effective approach to gather data about individual opinions on a large scale. The questionnaire consisted of two parts. The first part addressed the model variables, namely, system functionality, user interface, task interdependence, time criticality, user involvement, users' skill and knowledge, vendor responsibility, vendor experience, TTF, partnership quality, utilization, performance outcome, and user satisfaction. The questions, which respondents were asked to answer using a five-point Likert scale

(1=highly disagree, 5=highly agree), were adapted from previous studies by (Goodhue (1995), Lee and Kim (1999), Davis (1989), and Teo and Men (2008) (see Appendix for the list of questions). The second part focused on the respondents' demographics, including age, gender, job position, work unit/department, industry type, experience working with companies and using the ERP system, current ERP system used, and current ERP modules/applications used. Ten people knowledgeable in the field screened the items in the questionnaires for appropriateness. Their feedback was used to modify the questionnaire before it was used. The purposive sampling technique was used to collect data from 12 companies which have successfully outsourced their ERP systems. The questionnaires were directly handed to the persons authorized by their companies to answer the survey. All respondents were users of a company's ERP system and included senior managers, department managers, and department users. A survey incentive was used to increase the completeness of returned questionnaires. A total of 500 questionnaires were distributed and returned. After deleting outliers and missing values, 445 questionnaires were selected, accounting for 89 percent of the total number of questionnaire initially sent out. The sample size was greater than the threshold of 200 and more than ten times that of the parameters used in the research model for determining the appropriate sample size for the structural equation modeling (SEM) analysis technique (Barrett, 2007).

5. Results

- *Respondents' Profile*

Regarding the respondents' demographic profile, as shown Table 1, 46.7 percent of them were males and 53.3 percent females. Most of them were between 25 and 35 years old (71.7%). An overwhelming majority of them (84.5%) were staff members working in the departments of accounting, warehouse, sales/marketing, human resources, and production. 66.1 percent of them had more than 3 years of work experience and 69.2 percent more than 3 year-experience using ERP systems. Most of the respondents had used various ERP software, including SAP and Oracle as well as local software with different software modules for marketing and sales, accounting and finance, and human resources.

Table 1. Respondents' Demographic Profile

Profile	Frequency	Percent	Profile	Frequency	Percent
Gender			Work Experience		
Male	208	46.7	1-3 years	151	33.9
Female	237	53.3	3-5 years	118	26.5
			5-10 years	91	20.4
			10-20years	44	9.9
			> 20 years	41	9.2
Age			ERP Experience		
20-25 years	17	3.8	1-3 years	177	30.8
25-30 years	185	41.6	3-5 years	133	29.9
30-35 years	134	30.1	5-10 years	80	18.0
35-40 years	47	10.6	10-20 years	53	11.9
> 40 years	62	13.9	> 20 years	2	4.0
Work Position			ERP Modules		
Senior Manager	12	2.7	M/S	70	15.7
Department Manager	57	12.8	A/F	75	16.9
Department Staff	376	84.5	HRM	7	1.6
ERP Software			WHM	117	26.3
SAP	80	18.0	PDM	107	24.0

Oracle	40	9.0	L/SCM	38	8.5
Local software	325	73.0	PO/R	31	7.0

Note: M/S = marketing and sales; A/F = accounting and financial controlling; HRM = human resource management; WHM = warehouse management; PDM = production management; L/SCM = Logistic and Supply Chain Management; PO/R = Purchase Order and Request.

The structural equation modeling (SEM) analysis method was used to analyze the measurement model and the structural model. The measurement model is used to examine the relationship between the latent variable and its indicators whereas the structural model is used to examine the path strength and the causal relationship of the latent variables.

- Analysis of Measurement Model

This study used the Analysis of Moment Structure (AMOS) software to assess the important properties of the measurement model, including the goodness of the model fit and the construct reliability and validity. The model's fit was assessed on the basis of the six key indices, namely, the ratio of chi-square to degree-of-freedom (χ^2/df), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), incremental fit index (IFI), comparative fit index (CFI), and root mean square error of approximation (RMSEA). The results shown in Table 2 indicate that all fit indices fulfill the threshold values, confirming the good fit of the model (χ^2/df=2.206, GFI=.914, AGFI=.877, IFI=.953, CFI=.952, RMSEA=.052).

Table 2. Fit Indices of the Measurement Model

Fit indices	**χ^2/df**	**GFI**	**AGFI**	**IFI**	**CFI**	**RMSEA**
Recommended values	≤ 3.00	≥ 0.90	≥ 0.80	≥ 0.90	≥ 0.90	≤ 0.08
Actual values	2.206	.914	.877	.953	.952	.052

Construct reliability was estimated by using composite reliability (CR), which measures the stability and equivalence of the construct (Hair et al., 2009). A value of composite reliability greater than 0.7 is acceptable (Fornell & Larcker, 1981). It indicates that at least 70% of the variance in measurement is captured by the construct. As Table 3 shows, the composite reliabilities for all constructs ranged from 0.718 to 0.932, which are acceptable reliabilities of the constructs.

Table 3. Correlation, Composite Reliability, and Average Variances Exacted

	CR	**AVE**	**UI**	**TID**	**UIV**	**USK**	**VRE**	**VEX**	**TTF**	**PNQ**	**SYU**	**PFO**	**USF**
UI	0.932	0.875	**0.935**										
TID	0.801	0.577	0.213	**0.760**									
UIV	0.920	0.852	0.069	0.248	**0.923**								
USK	0.860	0.675	0.047	0.152	0.459	**0.821**							
VRE	0.892	0.806	0.035	0.072	0.282	0.426	**0.898**						
VEX	0.764	0.644	0.044	-0.020	0.228	0.253	0.605	**0.803**					
TTF	0.718	0.562	0.058	0.182	0.334	0.339	0.379	0.471	**0.750**				
PNQ	0.852	0.661	0.024	0.117	0.289	0.394	0.467	0.409	0.678	**0.813**			
SYU	0.861	0.756	0.030	0.158	0.315	0.306	0.230	0.270	0.435	0.490	**0.870**		
PFO	0.876	0.703	0.037	0.165	0.218	0.316	0.268	0.249	0.362	0.333	0.273	**0.838**	
USF	0.785	0.646	0.035	0.170	0.261	0.240	0.172	0.259	0.330	0.311	0.447	0.556	**0.804**

CR=composite reliability; AVE=average variance exacted; Diagonal elements=square roots of AVEs; Off-diagonal elements= correlation value of factors.

Construct validity was determined by the convergent and discriminant validities. Convergent validity was measured using the average variance exacted (AVE), which determines the extent to which indicators of a latent construct converge or have a high proportion of variance in common (Hair *et al.*, 2009). All the AVEs shown in Table 3 were above 0.56, which is greater than the recommended level of 0.5. Thus, the convergent validity is satisfied. Discriminant validity indicates whether the construct is distinct from other constructs and is calculated by comparing the square root of the AVE of each construct to the correlations between the construct and all other constructs (Fornell and Larcker, 1981). As can be seen in Table 3, all the square roots of AVEs (the diagonal elements) are higher than the correlation value of the factor and all other factors (the off-diagonal elements). The discriminant validity of each construct is therefore acceptable. In summary, the results from the measurement model evaluation showed satisfactory reliability, convergent validity, and discriminant validity. A structural model analysis could thus be conducted.

- Analysis of Structural Model

The path strength and causal relationships of the latent constructs in the proposed research model were examined with the AMOS software. The model's goodness of fit indices were examined first. Table 4 indicates a poor-fit of the model as the fit indices were not satisfied with the recommended values (χ^2/df=3.703, GFI=.815, AGFI=.780, IFI=.860, CFI=.859, RMSEA=.078). The model needed to be reexamined and modified. Therefore some causal relationships in the proposed model were removed since they provided insignificant causal effects ($p<0.05$). The modification indices and the claims for new causal relationships of the latent constructs were comprehensibly investigated, based on theoretical evidence, to improve the fit-model indices and estimate the best potential causal relationships among the latent constructs. As Table 4 shows, the final modified model provided better-fit indices and indicated a good-fit model (χ^2/df=2.504, GFI=.912, AGFI=.886, IFI=.943, CFI=.943, RMSEA=.058). In addition, all causal relationships between latent constructs were statistically significant.

Table 4. Fit Indices of the Final Model

Fit indices	**χ^2/df**	**GFI**	**AGFI**	**IFI**	**CFI**	**RMSEA**
Recommended values	≤ 3.00	≥ 0.90	≥ 0.80	≥ 0.90	≥ 0.90	≤ 0.08
Result values (Proposed model)	3.703	.815	.780	.860	.859	.078
Result values (Final Model)	2.504	.912	.886	.943	.943	.058

The path diagram of the final model in Figure 2 indicates the standardized regression weights, the significant levels of the effects, and the squared multiple correlations.

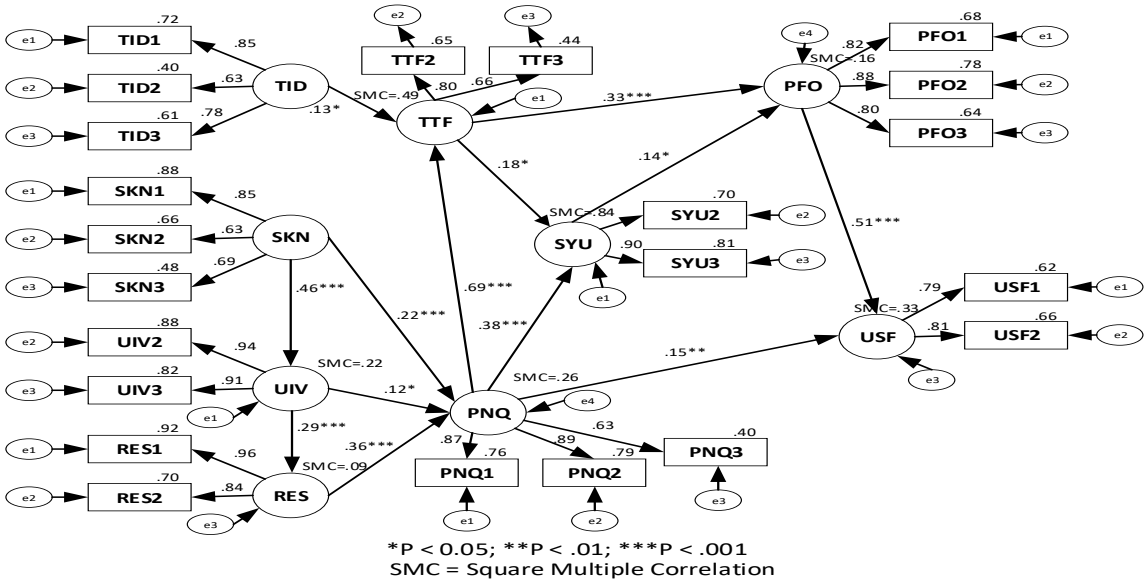

Figure 2: Final Model

6. Discussion

- Factors Influencing Task-Technology Fit and Partnership Quality

The study found that user interface (UI) does not have a significant influence on task-technology fit (TTF). H1 is therefore not supported. Respondents might perceive that UI is not the key ERP feature that they want to use or that the sytsem default UI is adequate. It was also found that task interdependence has a significant positive effect on TTF. H2 is therefore supported. The ERP software is a suite of integrated applications, which can automatically update new information into a single data repository and share data across key business functions such as manufacturing, purchasing, production planning, sales, and accounting. Respondents therefore can work and exchange data across organizational units to accomplish their tasks using the ERP system. Task interdependence fits well with the use of the ERP system. Figure 2 indicates that user involvement, users' skills and knowledge, and vendor responsibility have significant positive effects on the partnership quality. H3, H4 and H5, are therefore supported. User involvement enables a good relationship with a vendor team which in turn creates partnership quality. Users' skills and knowledge help the vendor team to obtain required and useful information (e.g., users' operational processes) necessary to implement the ERP system successfully. The vendor team also can easily communicate and collaborate with users who have adequate skills and knowledge about the ERP system. Users' skills and knowledge enhance effective communication and collaboration with vendors associated with partnership quality.

Furthermore, vendor responsibility enables users' trust in vendors, which will enhance partnership quality. Contrary to previous studies, this study found that vendor experience has no significant effect on partnership quality. H6 is therefore not supported. Thus vendor skills and expertise in specific applications of the ERP system and its implementation might create a knowledge gap and deteriorate collaboration between users and the vendor team. This study also determined that user skills and knowledge positively affect user involvement and in turn has a positive effect on vendor's responsibility. Users' skills and knowledge in organizational operations and ERP systems encourage users to actively participate in the ERP implementation process. In addition, users who actively work with the vendor team in implementing the ERP system will expect more vendor engagement and responsibility such as providing prompt services and responding to users' inquiries quickly.

- Effects of the TTF and Partnership Quality on the Success of ERP System Implementation

The study found that partnership quality has significant positive effects on TTF, system utilization, and user satisfaction. H7, H8 and H9 are therefore supported. Making the fit between ERP system and users' tasks requires synergy and both parties' efforts. Quality of partnerships manifests effective collaboration and supports the fit between users' tasks and the ERP system. Users will increase their use of the ERP system if they can get good support from vendors. This will not happen without good partnership quality. Partnership quality drives the utilization of the system. A good collaboration from vendors derived from partnership quality enhances user satisfaction. Accordingly, partnership quality influences user satisfaction. The results also show that TTF has a positive effect on system utilization and performance outcomes. Thus, H10 and H11 are supported. Users are more likely to use an ERP system that is able to perform their required tasks. A system that fits well with users' tasks will increase user performance in terms of the improvement of productivity and work quality. Furthermore, the study found that system utilization has a significant effect on performance outcomes which successively affect user satisfaction. H12 and H13 are therefore supported. Users working with the system on daily operations will increase their work performance. This study confirms the results from previous studies in that system performance positively affect user satisfaction (e.g., Batada & Rahman, 2012; Wei et al., 2008).

- *Implications for Theory*

The theoretical implications are twofold. Firstly, this study fills a gap in the system implementation success literature. It is among the first studies to incorporate a partnership quality perspective into the TTF theory to explain the success of outsourced ERP system implementation. Although many studies have adopted TTF to explain the success of system implementation in organizations, it lacks understanding of how TTF explains the success of system implementation in the outsourcing context. On the other hand, the perspective of partnership quality is necessary for the outsourcing success in system implementation, but it does not involve the characteristics of task and technology necessary for the system implementation success. This study tested and confirmed the effects of partnership quality and TTF on the outsourcing success of ERP system implementation associated with user performance and satisfaction.

Secondly, the study provides an important understanding of the predictive powers of TTF and partnership quality on the success of ERP system implementation in the outsourcing context. The results in Table 5 indicate that TTF has a greater effect on performance outcomes when compared to partnership quality (0.35 vs. 0.29). The result also shows that partnership quality has a greater effect on user satisfaction when compared to TTF (0.30 vs. 0.18). It can therefore be concluded that TTF and partnership quality have different and significant effects on the success of outsourced system implementation.

Table 5. Standardized Total Effects

	SKN	TID	UIV	RES	PNQ	TTF	SYU	PFO	USF
UIV	.465	.000	.000	.000	.000	.000	.000	.000	.000
RES	.137	.000	.295	.000	.000	.000	.000	.000	.000
PNQ	.322	.000	.221	.356	.000	.000	.000	.000	.000
TTF	.221	.125	.151	.245	.686	.000	.000	.000	.000
SYU	.161	.022	.110	.178	.499	.179	.000	.000	.000
PFO	.094	.044	.064	.104	.292	.350	.137	.000	.000
USF	.098	.022	.067	.108	.303	.179	.070	.511	.000

	SKN	TID	UIV	RES	PNQ	TTF	SYU	PFO	USF

- *Implications for Practice*

The study provides important implications for both client and vendor organizations. The implications for client organizations are twofold. Firstly, client organizations should opt for a technology suitable for their tasks as the fit between task and technology enables the success of system implementation. For instance, an ERP system could be designed and developed to effectively manage task interdependence in organizations (a manifestation of H1) leading to the improvement of user performance (a manifestation of H11).

Secondly, client organizations should pay attention to the importance of partnership quality when outsourcing ERP system implementation. Users from a client organization should develop a strong relationship with a vendor's project team to enhance the success of outsourced system implementation (a manifestation of H9). They should effectively collaborate and communicate with vendors such as supporting vendors' tasks and information when required. To do these, users should actively be involved and participate to support the organization's outsourcing project (a manifestation of H3). They should have sufficient knowledge and skills to work on the outsourcing project (a manifestation of H4). For instance, users should have a good knowledge of their work process and the system requirements so as to make an effective collaboration and communication with the vendor's project team. The organizations might provide training programs to enhance users' required skills and knowledge before outsourcing their ERP systems.

The implications for vendor organizations are twofold. Firstly, vendors should create a good relationship with clients, which is important for a successful system implementation in terms of user satisfaction (a manifestation of H9). Vendors should create trust and provide effective collaboration with clients. They should avoid unnecessary arguments and conflicts, which will destroy the relationship with their clients. To strengthen relationships with clients, vendor's responsibility is necessary (a manifestation of H5). For instance, vendors should provide services at the time they promise to do. They should also be willing and prompt to assist users' requirements and inquiries.

Secondly, vendors should improve the system performance to support user satisfaction (a manifestation of H13). For instance, vendors might attempt to offer and add new applications/functions on the implemented ERP system to support new users' required works and improve the quality of users' tasks.

- *Limitations and Future research*

This study has some important limitations. Firstly, it focuses only on the ERP system. This limits the generalizability of the study results regarding the success of a system implementation because each system has some unique characteristics that may alter the results of this study. In other words, different technologies (systems) have different functionalities to accomplish users' task requirements. To improve the generalizability of the study model, it is worth examining the study model across various systems such as a customer relationship management system and a supply chain management system.

Secondly, this study only collects data from participants working in SMEs. Task characteristics used in this study therefore may not suitably fit with tasks performed by large enterprises since large organizations have a greater scope of work and more complicated business processes. This will confine the generalizability of the study results. Future studies might include other task characteristics (e.g., task complexity, routine, and mobility) to understand the effect of TTF on the success of system implementation.

Thirdly, the study uses a purposive sampling method which does not randomly select a sample from a population. The study samples are selected from pre-specified companies that successfully outsourced their ERP systems in particular industries. The generalizability of the findings may thus be limited. Some probability sampling methods (e.g., a systematic sampling method and a cluster random sampling) might be considered for future studies.

Lastly, the study uses a cross-sectional data collection technique to gather data at one single point in time due to the time and cost constraints of this study. However, partnership quality can further develop as time goes by and the task requirements may change over time. The study, therefore, can result in bias of the outcome measures. It is worth examining the research model using a longitudinal study to validate the study results.

7. Conclusion

This study proposed a new model to explain the ERP system implementation success in an outsourcing context. The model integrates the task-technology fit theory and the partnership quality perspective to explain how their relationships affect the success of an outsourced ERP system implementation associated with performance outcomes and user satisfaction. The structural equation modelling (SEM) method was used to examine the research model. The results show that the task-technology fit, influenced by task interdependence, affects the system utilization and the performance outcomes, which in turn influence user satisfaction. Partnership quality, which is influenced by users' skills, knowledge, and involvement and by vendor responsibility, affects the task-technology fit, system utilization as well as user satisfaction. Partnership quality, however, has a greater effect on user satisfaction, whereas the task-technology fit has a greater effect on performance outcomes. This study fills a gap in the system implementation success literature as it broadens knowledge of the effects of the task-technology fit and the partnership quality on the success of the ERP system implementation in an outsourcing context. It also provides guidance for client and vendor organizations on what should be done and managed to enhance user performance and satisfaction.

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Appendix. Measurement items presented in the final model

Latent Construct	Abbrev	Measurement Items
Task Interdependence	TID1	My task is often completed with staff from other departments.
	TID2	My task often involves sharing knowledge or information with other departments.
	TID3	The results of my task are dependent on the efforts of people from within or outside my department
User Involvement	UIV2	I participate in identifying input/output of system needed for the company's ERP implementation
	UIV3	I actively involve throughout the ERP system implementation.
Skill &Knowledge	SKN1	I have knowledge in the specific applications of the ERP system.
	SKN2	I have overall knowledge of organizational operations.
	SKN3	I have sufficient skills and knowledge in managing the system effectively
Responsibility	RES1	They provides their services at the times they promise to do so.
	RES2	They gives prompt service to you or your team
Task-Technology Fit	TTF2	The ERP system is compatible with my workstyle
	TTF3	Using the ERP system enhances my task effectiveness
Partnership Quality	PNQ1	I get timely information from the ERP service providers about unexpected problems that could affect their ability to meet our technology needs.
	PNQ2	I have a very trusting relationship with the ERP service providers
	PNQ3	I have a long term partnership with the ERP service providers
System Utilization	SYU2	I frequently use the ERP system
	SYU3	I spend much time of my work to use the ERP system
Performance Outcome	PFO1	The ERP system increase the quality of my work.
	PFO2	The ERP system decreases the error rate of my work
	PFO3	The ERP system increase overall company's productivity
User Satisfaction	USF1	The information provided by the ERP system meets my expectations
	USF2	I am satisfied with the overall quality of the ERP systems