

An Exploratory Performance of Risks Factors for Pre-Implementation of ERP Project in Malaysia



Kwang Su Wei, Marzanah A. Jabar, Rusli H. Abdullah, Masrah A. Azmi Murad

Abstract: An Enterprise resource planning (ERP) system is designed to improve operational efficiency by integrating business processes and providing better access to integrated data across the entire organization (Badewi et al., 2018). However, ERP systems are complex, risky to implement, and time consuming (Al-Sabri et al., 2018). The aim of this paper is to identify the ERP risks emerge in pre-implementation of ERP system through the critical literature review and develop a risk model in order to create value for organization, user and vendor or consultant in managing the ERP project. This research studies contribute to the literature on ERP risk factors by determining whether these risk factors are affecting the pre-implementation ERP project success. From the effectiveness and usability perspective, this study will benefit IS management of the companies, system user, researchers, system provider, and ERP system consultant.

Keywords: ERP, ERP risk factor, ERP project management success, ERP pre-implementation phase.

I. INTRODUCTION

Enterprise resource planning (ERP) system is a software packages that engineered to institutionalize the sharing of organizational data resources (Kurbel, 2013). ERP increase the efficiency of the business process by integrating core business process into one single highly integrated application with share data and visibility (Beheshti et al., 2014; Barth and Koch, 2019). However, the integration of ERP system is time consuming and it requires many years of implementation. Unlike conventional software projects, numerous risks are affecting the ERP projects success. Inability to identify and manage the ERP risks can lead to failure of the project (Remus, 2007; Beheshti et al., 2014; Saade and Nijher, 2016; Reitsma and Hilletoft, 2018). Hence, it is important to identify the ERP project risks in order to reduce the risks that affecting the ERP project success (Garg and Khurana, 2017).

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The implementation of an ERP system consists three important phase: pre-implementation, implementation and post-implementation (Jagoda and Samaranayake, 2017). The starting phase known as pre-implementation phase. The steps and strategies adopted will be crucial for enabling successful of implementation ERP system (Soeini and Miri, 2011; Ali and Miller, 2017). The pre-implementation phase determine the basic prerequisites and readiness phases for enabling successful implementation of ERP system (Soeini and Miri, 2011; Jagoda and Samaranayake, 2017).

This paper aimed to make a contribution to the implementing of ERP system literature. A critical literature review by identifying the ERP risks emerge during the ERP pre-implementation phase. Therefore, this paper will seek answer for several specific research question, including what are the risk factors affecting the ERP system success in pre-implementation phase?

II. MATERIALS AND METHODS

The Initial research Model

The Quantitative research methodology is used in this study by starting from clearly identify the research problems and defining the research questions. Researcher used previous research of Sumner (2000), Wright and Wright (2001), Huang et al (2004), Ojiako et al. (2012), Ngai et al (2008) to identify ERP risk factors involves in ERP implementation. Table 1 below provides a more detailed description of these ERP risk factors and the initial research model was proposed as shown in Figure 1.

Table. 1 ERP risk factors

Risk Factor	Risks Factors Unique in ERP
Organization Fit	Failure to redesign business processes (Huang et al. 2004) Failure to support cross-organization design (Wright and Wright, 2001)
Skill Mix	Insufficient training and reskilling (Wright and Wright, 2001) Lack of business analysts with business and technology knowledge (Sumner, 2000) Failure to mix internal and external expertise effectively (Sumner, 2000)
Managerial	Lack of effective project management methodology (Huang et al. 2004) Lack of senior management support (Huang et al. 2004)



Software System Design	Lack of integration between enterprise-wide systems (Sumner, 2000; Wright and Wright, 2001; Huang et al. 2004) Failure to adhere to standardized specifications which the software supports(Sumner, 2000; Wright and Wright, 2001) Unclear/Misunderstand changing requirements(Huang et al. 2004)
User Involvement & Training	Insufficient training of end-users (Sumner, 2000; Wright and Wright, 2001; Huang et al. 2004) Fail to get user support(Huang et al. 2004)
Technology Planning /Integration	Application complexity (technical complexity and links to existing legacy systems) (Sumner, 2000; Wright and Wright, 2001; Huang et al. 2004)
Vendor & Consultant Risks (External Factor)	Vendor teamwork and composition(Ojiako et.al (2011) Inadequate technical support by external expertise (Ngai et al 2008)

Business Sector	ng (Agro Based)		
	Manufacturi ng	12	40.0
	(Services)		
	Service (ICT)	12	40.0
	Primary Agriculture	3	10.0
Number of full-time employees	Less than 5	7	23.3
	5-19	3	10.0
	20-50	10	33.3
	51-150	3	10.0
	151-200	4	13.3
	More than 1000	3	10.0
Annual Sales Turnover	RM200,001 -	4	13.3
	RM250,000 - RM250,001		
	-	23	76.7
	RM1million - RM5million		
	-		
	RM10millio n	3	10.0
Organization Status	ISO	14	46.7
	Non-ISO	16	53.3
ERP	SAP	11	36.7
Vendor/Consultant	Oracle	8	26.7
	Infor Global Solution	5	16.7
	People Soft	4	13.3
	The Sage Group	2	6.7
Years of adopting ERP system	1-2 years	2	6.7
	3-5 years	17	56.7
	6-10 years	9	30.0
	10-15 years	2	6.7

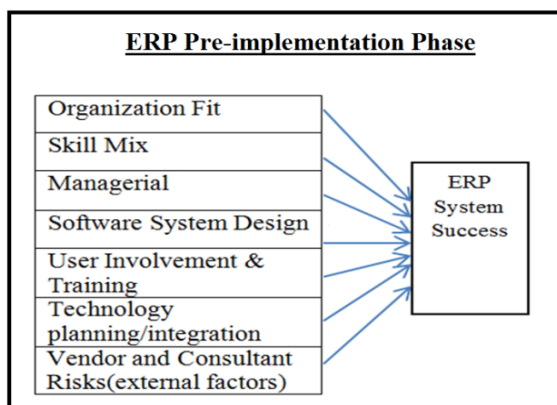


Fig. 1 Initial Research Model

A pilot study is a minor preliminary study conducted before the main research begins particularly when developing and testing the adequacy of the research instrument. For data collection purpose, a set of survey questionnaire was developed. The target sample for this study is Malaysian companies adopted ERP system. To test reliability and validity on complex variable relationships and obtain model validation, the data collected is then analyzed by using Statistical Package of Social Science (SPSS).

Table. 2 Demographic details of pilot study respondents (N=30)

Variables		Frequency	Percentage %
Category of Respondent	User	6	20.0
	Consultant	7	23.3
	Vendor	10	33.3
	Maintenance	6	20.0
	Others	1	3.3
Category of	Manufacturi	3	10.0

The results of the pilot study (Table 2) shows that among 30 respondents, 33.3 % of the respondents are vendor, 23.3% are consultant, 20% are user, 20% are maintenance, and 3.3% are others. In term of business sector distribution, 40% manufacturing-related services sector, 40% in service sector, 10% agriculture based manufacturing sector and remaining 10% of firms in the Primary Agriculture. Based on the analysis result, most of the respondents company have 20 to 50 full time employees (33.3%), followed less than five full-time employees (23.3%), of respondents' company have 151 to 200 full-time employees (13.3%), 5 to 19 full-time employees (10%), 51 to 150 full-time employees (10%) and more than 1000 full-time employees (10%).

The results show that the majority of respondents' company have annual sales turnover of RM250001 to RM1 million (76.7%), 13.3% of companies have annual sales turnover RM200001 to RM250000, while the remaining 10% of companies have annual sales turnover RM200001 to RM250000.

From the organizational status perspective, 46.7% of the respondents' company have ISO certified, while remaining 53.3% with non-ISO certified.

There are various packaged ERP systems provided by different ERP vendors in Malaysia, about 36.7% of companies have selected SAP as their ERP vendor or consultant. 26.7% of companies have choose Oracle's ERP software for implementation, 16.7% of companies have selected Infor Global Solution, 13.3% of companies selected People Soft, while the remaining 6.7% of companies have selected The Sage Group. The result shows companies indicate a fairly time consuming implementation, with 56.7% of companies adopting an ERP system over than three to five year, six to ten years (30%), companies have implemented the ERP system one to two years (6.7%), while the remaining 6.7% of companies have implemented the ERP system more than 10 years to 15 years.

III.RESULTS AND DISCUSSION

Instrument Reliability Analysis

To measure internal consistency, Cronbach's alpha was used in this study. The result were compared with the minimum value (i.e., alpha = 0.6) for the questionnaire. From the result, all factors carry Cronbach's Alpha score of

more than 0.7 (refer to table 3). Hence, this indicates that the variables are reliable and can be used for the intended study.

Table. 3 ERPPre-ImplementationPhase

Construct	Reliability Coefficient (α - Cronbach values)
Organizational Fit	0.833
Skill Mix	0.858
Managerial	0.870
Software System Design	0.851
User Involvement and Training	0.855
Technology Planning/Integration	0.847
Vendor and Consultant Risks (external factor)	0.877
ERP SYSTEM SUCCESS	0.899

Instrument Validity Analysis

In depth examination on relevant literature was carried out during the preparation of the interview questions to assure content validity. Based on the findings, the questions were redesigned to improve their readability.

Table. 4 Factor loading for PreImplementation Phase

Construct	Scale Items	Factor Loading	Initial Eigenvalues	Kaiser-Meyer-Olkin Measure of Sampling Adequacy
Organizational Fit	PREOF1	.756	3.076	.634
	PREOF2	.822		
	PREOF3	.759		
	PREOF4	.818		
	PREOF5	.763		
Skill Mix	PRESM1	.716	3.558	.807
	PRESM2	.814		
	PRESM3	.725		
	PRESM4	.798		
	PRESM5	.844		
	PRESM6	.712		
Managerial	PREM1	.750	3.686	.769
	PREM2	.660		
	PREM3	.733		
	PREM4	.953		
	PREM5	.863		
	PREM6	.705		
Software Systems Design	PRESSD1	.704	3.156	.773
	PRESSD2	.855		
	PRESSD3	.852		
	PRESSD4	.776		
	PRESSD5	.774		
User Involvement and Training	PREUIT1	.878	3.538	.792
	PREUIT2	.658		
	PREUIT3	.722		
	PREUIT4	.755		
	PREUIT5	.836		
	PREUIT6	.738		

Technology Planning/Integration	PRETP1	.504	3.120	.764
	PRETP2	.726		
	PRETP3	.558		
	PRETP4	.616		
	PRETP5	.716		
Vendor and Consultant Risks (external factors)	PREVC1	.763		
	PREVC2	.786		
	PREVC3	.758	3.762	.752
	PREVC4	.835		
	PREVC5	.840		
	PREVC6	.765		

Generally, the factors loading should be equal to or greater than 0.4 (Nunnally, 1978; Straub et al., 2004). All the loading of all items ranged 0.504 to 0.953 which higher than 0.5 of factor loading (Refer to Table 4). Based on the result, seven risk factors involved in this study have good reliability and. Therefore, all 39 items scale can be used for the intended study.

IV. CONCLUSION

This paper focused on risk factors involved pre-implementation phase. The researcher believes that the results of this study are significant to the advancement ERP evaluation theory and improving professional practice related to IS evaluation. The researcher proposed a risk model to identify ERP risks to create a useful risks management tool for ERP adoption organization. This model would provide better insight to the project managers on how risk factors affecting the ERP project outcomes and reduce the possibility of project failure. In additional, the introduction of ERP risks model could provide useful information for the ERP system providers or vendors. The ERP vendors in this region can use this research finding as the input for marketing planning. At the same time, the system provider can concentrate on risk dimensions which propose by the conceptual framework to identify the factors contributing to the ERP systems and improve their services quality for the client.

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