Analysis of Enterprise Resource Planning (ERP) Implementation in SMEs in East Kalimantan Indonesia

By Yunizar Fahmi

Islamic University

Abstract- The ERP (Enterpise Resource Planning) system is designed to coordinate the resources, information and activities required in the company's business processes. Successful implementation of ERP system can provide an increase in terms of effectiveness and efficiency of business operations at the company. But the realization implementation of ERP systems into a very complex process, so that not infrequently encountered failure in its application. Failure in the implementation of ERP systems resulted in enormous losses for the company. Thus the correct analysis is needed in order to achieve the successful implementation of ERP to benefit from its application. This research is a quantitative research using three independent variables: top management support, effective project management, and user engagement. The purpose of this research is to analyze the critical factors that can improve the success of the implementation process of ERP systems in SMEs in East Kalimantan. The method used is multiple linear regression analysis. The results of the research simultaneously show that there is a significant influence between the key factors on the success of implementation. While the partial factor of top management support, effective project management quite significant effect. However, the factor of user engagement has no significant effect on the success of ERP implementation.

Keywords: ERP (enterprise resource planning), critical success factor, small medium enterprise.

GJMBR-A Classification: JEL Code: M19

ANALYSISOFENTERPRISERESOURCEPLANNINGERPIMPLEMENTATIONINSMESINEASTKALIMANTANINDONESIA

Strictly as per the compliance and regulations of:

Analysis of Enterprise Resource Planning (ERP) Implementation in SMEs in East Kalimantan Indonesia

Yunizar Fahmi

Abstract- The ERP (Enterpise Resource Planning) system is designed to coordinate the resources, information and activities required in the company's business processes. Successful implementation of ERP system can provide an increase in terms of effectiveness and efficiency of business operations at the company. But the realization implementation of ERP systems into a very complex process, so that not infrequently encountered failure in its application. Failure in the implementation of ERP systems resulted in enormous losses for the company. Thus the correct analysis is needed in order to achieve the successful implementation of ERP to benefit from its application. This research is a quantitative research using three independent variables: top management support, effective project management, and user engagement. The purpose of this research is to analyze the critical factors that can improve the success of the implementation process of ERP systems in SMEs in East Kalimantan. The method used is multiple linear regression analysis. The results of the research simultaneously show that there is a significant influence between the key factors on the success of implementation. While the partial factor of top management support, effective project management quite significant effect. However, the factor of user engagement has no significant effect on the success of ERP implementation.

Keywords: ERP (enterprise resource planning), critical success factor, small medium enterprise.

I. Introduction

Information technology has become an important part and can not be separated from the business world. Utilization of information technology for the company becomes a requirement to support the mastery of the business it runs (business mastery). Thus the company has a competitive advantage and efficiency of performance so that the competitiveness compared to other companies that encourage companies to apply a system in information technology that is ERP (Enterprise Resource Planning). ERP is an enterprise information system designed to coordinate all resources, information and activities needed for a complete business process, such as finance, production, inventory, marketing, human resources and so on.

Implementation of ERP is a very complex process. Implementation of ERP requires a large investment of money, time and expertise. In general, ERP systems cost a lot. However, if the ERP system is implemented successfully, significant benefits such as improved customer service, better production scheduling, and reduced production costs can be obtained. Successful implementation of ERP can provide enormous benefits to a company's success, but on the other hand it can be a nightmare for companies failing to manage the implementation process [1].

But in the realization, the implementation of ERP systems into a very complex process, so that not infrequently encountered failure in its application. Implementation of ERP requires a large investment of money, time and expertise. The ERP system is expensive, and once the ERP system is implemented successfully, significant benefits such as improved customer service, better production scheduling, and reduced production costs can be obtained. Successful implementation of ERP can provide enormous benefits to a company's success, but on the other hand it can be a nightmare for a company that fails to manage the implementation process which results in enormous losses for the company [2].

There are two levels of failure, namely total failure and partial failure. In total failure, the project was terminated prior to implementation or failed in the implementation process causing the company to experience serious financial problems in the long run. While in partial failure, ERP implementation can disrupt the daily operations of the company. It becomes interesting to investigate mainly from factors that affect the success rate of ERP system implementation [3]. Thus the correct analysis is needed in order to achieve the successful implementation of ERP to benefit from its application. Thus the correct analysis is needed in order to achieve the successful implementation of ERP to benefit from its application.

Research on successful implementation of ERP in SMEs found in Indonesia is still limited. Referring to large companies, the number of unsuccessful in ERP implementation is high. However, the successful implementation of ERP in large companies can not be equated with those that occur in companies with small and medium scale (SMEs). Thus, it is necessary to analyze the factors to know and improve the success of ERP implementation. Research focusing on CSF in small and medium enterprises has been recommended

Author: Departement of Informatics Engineering, Islamic University of Indonesia, Yogyakarta, Indonesia. e-mail: nizar.fahmi.bdr@gmail.com

by the research community for several years. One of them is research conducted by Hidayat who examines the factors that influence the success of ERP implementation on SMEs in Bandung. [4]

The purpose of this research is to analyze the factors that can improve the success of the implementation process of ERP systems in SMEs in East Kalimantan. There are three factors tested: support from top management, effective project management, user engagement. The method used in this research is multiple linear regression analysis.

II. Literature Review

a) Critical success factors

Critical success factors are the most critical or most important internal organizational factors that may be used by an organization in an industry as the primary tool for addressing opportunities and threats to survive and win the competition. Critical success factors are a set of critical factors or activities necessary to ensure a business's success. In addition, critical success factors are defined as an element of organizational activity that is central to a successful organization in the future. Critical success factors can be said to be aspects of a business that are important to achieve or maintain [6].

The critical success factors for ERP projects are defined as references to any conditions or elements deemed necessary for the implementation of ERP to be successful. Rockart was the first to research for the implementation of IT success. According to Rockart, the factors of success are that if the work is satisfactory it will guarantee the success of competitive performance for the organization [7].

b) Top management support

Top management support in ERP implementation has two main aspects: (1) leadership, and (2) provide the necessary resources [8]. Strong and committed leadership is a necessary condition for success in ERP implementation. Top management should provide clear direction to the project team and monitor the progress of the project [9]. The willingness to provide the necessary resources is a form of top management support. Implementation will be constrained if some major resources, such as people, funds and equipment are not available.

Top management support is required throughout the implementation. The role of the new system should be communicated to employees. Policies must be set by top management to build new systems in the company. Top management must publicize and explicitly identify this project as a top priority [10].

c) Effective project management

Project management as an activity plan, organize, lead, and control the company's resources to achieve its goals short term that has been determined by using the system approach and hierarchy, both vertical and horizontal [11]. ERP implementation system is a collection of complex activities involves all business functions within the company and takes that time long enough. In improving the success of ERP implementation, required an effective project management strategy to control it is expected to avoid costs that exceed larger budgets and ensuring implementation time in accordance with the estimated schedule [12].

Research Zhang et al. shows that effective project management must have a formal plan, the setting of a time constraint a realistic, experienced project leader, and presence meetings regularly to monitor the status of the project in order to improve successful implementation of ERP [8].

d) User Engagement

User engagement is a form of participation in the development of systems and implementation processes represented by user groups. User engagement refers to an individual's psychological state and is defined as the interests and relationships of the system with the user. It is also defined as user participation in the implementation process. The function of the ERP system relies on the user to use the system after going live, where the user is a significant factor in the implementation process [9].

There are two areas of user engagement when a company decides to implement an ERP system, which is user engagement in the defining phase of the needs of a corporate ERP system and user participation in the implementation of an ERP system. Engaging users in the stage of defining the needs of enterprise information systems can reduce their resistance to the new system to be built, as users feel opt in and make decisions [8].

e) Small Medium Enterprises (SME)

SMEs are Small and Medium Enterprises engaged in all types of businesses such as fashion, culinary, IT, retail and so forth. Small and Medium Enterprises (SMEs) according to Law no. 20, year 2008 on SMEs, is [14]:

a. Small Business is a stand-alone productive economic enterprise, carried out by an individual or business entity that is not a subsidiary or not a branch of a company owned, controlled, or becomes a part of the direct or indirect business of a medium-sized or large-scaled business that has assets between 50 million - 500 million rupiahs and revenue between 300 million - 2.5 billion rupiahs.

b. Medium Enterprise is a stand-alone productive economic enterprise, conducted by an individual or business entity that is not a subsidiary or a branch of a company owned, controlled, or becomes part directly or indirectly with a Small Business or a large

business with a net worth or annual sales results. It has asset criteria between 50 million - 10 billion rupiahs and revenue between 2.5 billion - 50 billion rupiahs.

III. Research Methods

This research is a quantitative research conducted to analyze the influence of top management support support, effective project management, and user engagement on successful implementation of ERP in SMEs in East Kalimantan.
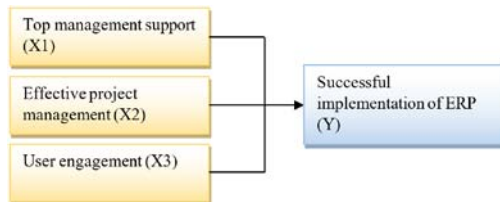

Figure 1: Research Model

In Figure 1 research model, the hypothesis in this research are:

H1: Top management support affects the success rate of ERP implementation significantly.

H2: Effective project management affects the success rate of ERP implementation significantly.

H3: User engagement affects the success rate of ERP implementation significantly.

H4: Top management support, project management and user engagement significantly affect the success rate of ERP implementation.

Operational variables of top management support (X1), effective project management (X2), user engagement (X3) and successful implementation of ERP (Y) are shown in table 1 of the following operational variables.

Table 1: Operational Variables

Variables	Indicators	Scale
Top management support (X1)	1. Commitment to the project. 2. Top management provides the necessary resources in the implementation period. 3. Top management shows a leadership attitude.	Ordinal
Effective project management (X2)	1. Project management has a formal plan. 2. Project management has realistic time constraints. 3. Establish an experienced project leader. 4. Project managers conduct regular meetings to monitor project status.	Ordinal
User engagement (X3)	1. User engagement in the defining phase of the needs of the corporate ERP system and user participation in the implementation of ERP systems. 2. Involve the user in the stage of defining the needs of enterprise information systems can reduce their resistance to the new system to be built, as users feel it is coming choose and make decisions.	Ordinal
Successful imple-mentation of ERP (Y)	1. ERP implementation improves quality both in terms of system quality, information quality, and service quality. 2. User satisfaction of the system either from the content (content), form/ format, ease in using the system or in terms of timeliness in providing the necessary information. 3. Net benefits are assessed by improving user productivity, well-organized and controlled documentation data, as well as increased resource-saving improvements.	Ordinal

The object of research is SMEs are located in East Kalimantan. The study population is SMEs in East Kalimantan with a sample of 30 respondents. Sampling data is done using sampling technique. The measurement scale used is Likert scale with the following rating levels: 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree) and 5 (strongly agree). The Likert scale is used to examine how strongly the subjects agree or disagree [13].

The analytical technique used in this study using multiple linear regression analysis whose equations can be written as follows:

$$Y = \alpha + b_1X_1 + b_2X_2 + b_3X_3 + e \qquad (1)$$

Notes:
Y : Successful implementation of ERP
α : Constants
b1..b3 : Coefficient of regression
X1 : Top management support
X2 : Effective project management
X3 : User engagement
e : error term

IV. Research Result

Results of data processing showed the number of men respondents by 79.3% and women by 20.7%. 81.8% are university graduates and 18.2% have postgraduate education. 74.2% of respondents are

managers and 25.8% are directors. And 58.7% of respondents have worked for the company for 1-5 years. Over 90% of users of ERP systems are companies that have stood for more than 5 years.

a) *Coefficient of Determination R (R^2)*

Results of data processing shows the number of R square (R^2) of 0.751 or 75.1%. This shows that the ability of independent variables to explain variation of dependent variable reach 75.1%. The independent variables used in the model are able to explain the variation of the success variable of ERP implementation by 75.1%, while the remaining 24.9% is the contribution of other factors besides top management support (X1), effective project management (X2), user engagement (X3) which was not observed in this research.

b) *Simultaneous Test (F)*

To know the significance of an influence of the independent variables (X) simultaneously on a dependent variable (Y) used F test. The results of hypothesis testing are as follows:

Table 2: Result of Simultaneous Test (F)

Model	Sum of Squares	df	Mean Square	F	Sig
Regression	196,969	7	32,828	3,609	0,009[b]
Residual	245,576	23	9,095		
Total	442,545	30			

Based on the output in table 2 obtained significance value of 0.009 smaller than 0.05 or 0.009 <0.05. The significance value is smaller than α = (0.05). This means there is a significant effect simultaneously between the top management support variables (X1), effective project management (X2), user engagement (X3) on the successful implementation of ERP (Y) on SMEs in East Kalimantan.

c) *Partial Test (T)*

Analysis of partial influence is used to find out how closely the influence of each independent variable with the dependent variable. The results of data processing can be seen in table 3 below:

Table 3: Partial Hypothesis Testing Results (t test)

Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
(Constant)	2,543	2,953		1,017	0,134
Top management support	0,408	0,232	0,157	2,959	0,178
Effective project management	0,424	0,238	0,231	2,812	0,109
User engagement	0,227	0,212	0,198	1,763	0,235

Based on table 3, the results of multiple linear regression equations in this study are as follows:

$$Y = 2,543 + 0,408\ X_1 + 0,424\ X_2 + 0,227\ X_3 + e$$

Based on the calculation in table 3, for the first hypothesis that is the top management support (X1), it is found that the significance level of 0.178 is greater than α = 0.05 or 0.178> 0.05. H_0 is accepted which means that partially vendor support variable (X1) has significant effect on successful implementation of ERP (Y) at UMKM in East Kalimantan.

Based on the calculation in table 3, for the second hypothesis that the effective project management (X2) obtained that the significance level of 0.109 is greater than α = 0.05 or 0.109> 0.05. H0 is accepted which means that partially effective project management variable (X2) has significant effect on the successful implementation of ERP (Y) at UMKM in East Kalimantan.

Based on the calculation in table 3, for the second hypothesis that user engagement variables (X3) obtained that the level of significance of 0.235 is greater than α = 0.05 or 0.235> 0.05. H_0 is accepted which means that partially user engagement (X3) has no significant effect to the successful implementation of ERP (Y) at UMKM in East Kalimantan.

Based on simultaneous test results as shown in table 3, the significance level is 0.009 or below 0.05, then H_0 is rejected and H_a is accepted which means simultaneously top management support, effective project management, and user involvement have a positive effect on the successful implementation of ERP significantly. This indicates that in improving the success of ERP implementation requires top management support, effective project management, and user engagement, the success of ERP implementation will be higher.

V. Conclusion

The conclusions of this research show that top management support, effective project management, and user engagement simultaneously have a significant effect on the successful implementation of ERP in SMEs in East Kalimantan. Partial test of hypothesis, it is found that top management support, effective project management does significantly to affect the success of ERP Implementation on SMEs in East Kalimantan. Furthermore, partial test of user engagement does not significantly affect the successful implementation of ERP in SMEs in East Kalimantan. The results of this research reveal that still need some improvement to maximize the success of ERP implementation.

The limitations of this study are the findings of this study limited to companies in East Kalimantan. The lack of respondents who contributed also to the limitations of this study. Another limitation is the wider scope of success factors not included in this study due to time and cost constraints. For future research, this research model can be expanded by adding other success factors.

References Références Referencias

1. Kowanda, D., M. Firdaus and R. B. F. Pasaribu. 2016. Relevansi Usaha Kecil Menengah dan Implementasi Sistem ERP: Dimensi Strategik Kontekstualitas. Jurnal Ekonomi Bisnis, 9(3): 131-152.
2. Koh, S. C. L. and M. Simpson. 2007. Could enterprise resource planning create a competitive advantage for small businesses? Benchmarking: An International Journal, 14: 59-76.
3. Cahyadi, I. 2006. Implementasi Sistem ERP pada UKM:Peluang dan Tantangannya. Proseding Konferensi Nasional Sistem Informasi (KNSI 2006).
4. Hidayat, R. A., S. Rahayu, dan A. Nurbaiti. 2017. Faktor-Faktor Penentu Keberhasilan Implementasi ERP UKM di Bandung. ASSETS, 7(2): 167-182.
5. Tripomo,Tedjo. 2005. Manajemen Strategi. Rekayasa Sains, Bandung.
6. Rockart, John. 1979. Chief executives define their own data needs. Harvard Business Review: 81-92.
7. Zhang, L., K. O. L Matthew, Z. Zhang, and P. Banerjee. 2002. Critical Success Factors of Enterprise Resource Planning Systems Implementation Success in China. In Proceedings on the 36th Hawaii International Conference on System Science: 5(3): 1-10.
8. Bhatti, T. R. (2005). Critical Success Factors for The Implementation of Enterprise Resource Planning (ERP): Empirical Validation. The Second International Conference on Innovation in Information Technology (IIT'05).
9. Nah, F., Lau, J. & Kuang, J. (2001). Critical factors for successful implementation of enterprise systems. Business Process Management Journal, 7(3), 285-296.
10. Agaoglu, M., E. S. Yurtkoru, dan A. K. Ekmekci. 2015.The effect of ERP implementation CSFs on business performance: an empirical study on users' perception. International Conference on Leadership, Technology, Innovation and Business Management. Procedia-Social and Behavioral Sciences 210 (15); 35-42.
11. Macredie, R. D. dan C. Sandom. 2009. IT-enabled change: evaluating an improvisational perspective. European Journal of Information Systems.
12. Sekaran, U. & Bougie, R. (2010). Research Methods for Business. John Wiley & Sons Ltd.
13. Republic of Indonesia. Law Number 20, Year 2008, about Micro, Small and Medium Enterprises. Secretariat of State: Jakarta, 2008.