

Information Technology Adoption Efforts in Improving The Performance of Indonesia SMEs

Mercurius Broto Legowo¹, Budi Indiartho², Deden Prayitno³

^{1,3} Information System Study Program, Faculty of Information Technology
Perbanas Institute, Jakarta, Indonesia

² Informatics Study Program, Faculty of Information Technology
Perbanas Institute, Jakarta, Indonesia



Abstract – Information Technology (IT) adoption efforts and implementation of new technology in the Small Medium Enterprises (SMEs) sector with a good level of success is very important in the performance of SMEs business. This study aims to analyze the causal relationship between the success of ERP system with SMEs performance and payment gateway by adopting it as a moderation variable, then consider employee size of SMEs as a control variable. The owner or manager of SMEs from 63 SMEs in Indonesia completed the questionnaire analyzed through empirical analysis by using Smart PLS. In investigating the analysis of control variable will empirically using the Random Effect Model to analyze the effect of employee size on SMEs performance. The results of this study indicate that the adoption of IT through the success of the ERP system has a significant impact on SMEs performance, but the implementation of payment gateways has failed to moderate the performance of SMEs, and then the employees size of SMEs (as a variable control) has an impact on Indonesian SMEs performance. Furthermore, the research contribution shows that IT adoption efforts in ERP system success and Payment Gateway implementation as new technology will have the impact on improving the SMEs performance.

Keywords – ERP System Success, Employee Size, Indonesian SMEs, Payment Gateway, SMEs Performance.

I. INTRODUCTION

As the globalization rises, small and medium-sized enterprises (SMEs) in Indonesia have an important role of opening the local products/services to the global markets, as well as competing with multinational competitors in the local markets. Small and medium-sized enterprises (SMEs) are an essential part of economic growth according to their number and presence in economic environments ^{[1],[2]} and their contribution in job creation and economic growth ^[3]. Information is a strategic resource that both measures business success and also provides opportunities for diversification. Thus, Small and medium-sized enterprises are part of the information society and need to access and use

information strategically if they are going to compete effectively ^[4].

Organizational performance in the SMEs sector is currently still showing many deficiencies and limitations. According to a study conducted Suliyanto by (2009) states that to measure the performance of organizations in small and medium enterprises (SMEs) is more suitable to use the growth approach because small companies are generally less open in the financial statements so it is difficult to interpret the financial related business. Thus, the performance of Indonesian SMEs is an achievement on the success of SMEs by looking at success rates based on aspects of sales growth and profitability ^{[5],[6]}. By improving the performance

of SMEs, it is expected that Indonesian SMEs can maintain its business viability and win the competition in the global market.

IT adoption such as ERP system and Payment gateway implementation for which a lot of resistance is offered in SMEs for implementation due to higher investments and more failures associated with it. The ERP system is one of the most powerful IT tools for business sectors. According to Wibowo, the implementation of ERP system adapted to the modules so that the ERP System can be classified according to their needs ^{[7],[8],[9]}. This will make it easier for Indonesian SMEs to adopt an ERP system. ERP system success issues are necessary to encourage. In the past few years, many business organizations of large, medium or small enterprises have attempted to develop, design and implement the ERP system in their own way ^{[10],[11],[12]}. This study is motivated, in part, by the lack of utilization of information technology to implement ERP system in some research in the information systems (IS) field dealing with the success of ERP systems beyond the implementation phases ^{[13],[14]}. In addition, this is inspired by the need to improve understanding of the relationship between the relevant issues of the success of the ERP system that may affect performance ^[15]. According to Teja, the implementation of payment gateway as one of the financial technology services is still low among SMEs because of the lack of habits using new technology. Few studies have investigated the implementation of payment gateway in Indonesia and overall performance ^{[16],[17]}. The intensive efforts of policymakers in SMEs for the adoption of that new technology that can overcome the problem of market demand, furthermore, will impact on the performance of SMEs.

Small and medium-sized enterprises are non-subsidiary, independent companies which employ less than a given number of employees ^[15]. This number varies in different countries. Meanwhile Indonesian Central Bureau of Statistics ^[3] based on the size of the employees of SMEs is stated that for Small Business is a business that has a number of employees 5 to 9 people, then the Medium Business has 20 - 99 people. The previous studies have shown that the size of the SME employee has an effect on the performance of SMEs ^{[18],[19],[20]}. Employee size of SMEs needs to be considered in achieving the success of the ERP system further impact on the performance of SMEs.

None of those studies mention the success of ERP systems, payment gateways, and the size of SME employees as control variables belonging to the performance of Indonesian SMEs. Many previous studies have limited results

on the analysis and review of ERP system implementation ^{[8],[28]}. Some studies have successfully observed the using of financial technology ^{[16],[21]}. This study is the way forward and should be encouraged to adopt information technology such as ERP systems success and implementing new technologies (payment gateways, etc.) as this can be an important factor for future growth and success for SMEs in the long term.

II. MATERIAL AND METHODS

The material and methods is organized according to the four basic constructs of the research: SMEs performance, ETP System success, Payment gateway, and employee size of SMEs.

2.1 SMEs Performance

In organization theory, as expressed by researcher Frederick W. Taylor in 1960, stated that the application of scientific methods for research, analysis and problem-solving organization or set of mechanisms aimed to improve the efficiency of organizational performance. Improving the performance of Indonesian SMEs is a fundamental problem in research ^{[8],[28],[29]}. Lack of use of information technology and systems as one of the issues in adopting IT and can affect the achievement of SMEs performance ^[30]. Furthermore, Mudiantono stated that the results of his research indicate that the success of the ERP system implemented can improve the performance of SMEs ^[8]. Organizational performance is also an achievement of organizational success in operating organizational resources with indications of sales growth and profitability ^{[31],[32]}.

According to a study conducted by Sulyanto states that to measure the performance of organizations in small and medium enterprises (SMEs) is more suitable to use the growth approach because small companies are generally less open in the financial statements so it is difficult to interpret the financial related business. Thus, the performance of Indonesian SMEs is the achievement of business success with an indication of success rate based on aspects of sales growth and profitability ^{[5],[29]}.

2.2 ERP System Success

In this study, can be defined that the ERP system for SMEs in Indonesia is a package of information systems, which is a combination of technology and business practice seeks to create an integrated product to be able to manage most of the business operations of SMEs as well as developed based classification of its use ^{[8],[9],[33]}. Hamilton ^[33] defined that the classification of ERP is (1) A - if the company uses all modules integrated in the ERP system effectively on all department in the company, i.e. Human Resources module,

Finance module and Operations module (2) B - if using a combination of two modules that are integrated in the ERP system (3) C - if using the ERP system module is only partially. ERP systems can interact automatically with suppliers and customers by exchanging information and producing highly comprehensive and integrated information that can be used for online transactions (e-Payment) and decision making [34][35].

2.3 Payment Gateway

In this research, define that Payment Gateway is one way to process electronic transactions and provide tools for processing payments between customers, businesses and banks which is expected to improve the performance of Indonesian SMEs [35],[36]. The indication that Indonesian SMEs have implemented Payment Gateway is by using payment system from customer to SME or from SME to supplier online or mobile payment [37],[38].

2.4 Employee Size

Considering organizational resources, that can be proxy by firm size, there are non-imitable managerial abilities physical resources into competences. According to our research subject and our sample, employee size of SMEs as one control variable to the regression model. Based on the dedicated literature [20], employee size of perceived as an important contextual factor that may induce a high impact on IT adoption efforts and their influence on SMEs performance. We, therefore, integrate a firm's size thru their total amount of employee as a control variable in this research model. In this study, Indonesian SMEs according to the Indonesian Central Bureau of Statistics [3] it can be defined that Small Enterprises is a type of business that has 5 to 19 workers, and Medium Enterprises is a type of business with 20 to 99 employees. Several previous studies have shown that employee size of SMEs has an effect on SMEs performance [18],[30],[14]. Several previous studies have shown that employee size is a vital element of firm performance. Theoretically, the employee size of a firm can affect a firm's performance in many ways. According to a study conducted by Vo Van Dut where firm size is used as a control, variable indicates that the main features of large firms are their varying abilities, their ability to exploit economies of scale and formalization of procedures. In this study, employee size of SMEs that determines whether the type of small and medium enterprises affect the success of ERP systems on the performance of Indonesian SMEs.

2.5 Research Model

The proposed research model is shown in Figure 1. This model has been developed to answer research questions. The research questions based on this research model were: 1) Does the ERP system success affect SMEs Performance? 2) Does the ERP system success affect SMEs performance moderated by payment gateway? 3) Does the ERP system success affect SMEs performance moderated by payment gateway utilization taking into consideration the employee size as a variable control?

Specifically, in this research model has 2 variable of the construct which has dimension, that is ERP System Success variable as Independent variable with dimension is system quality, information quality, individual impact and organizational impact, then SMEs Performance variable as the dependent variable, with the dimension of sales growth and profitability.

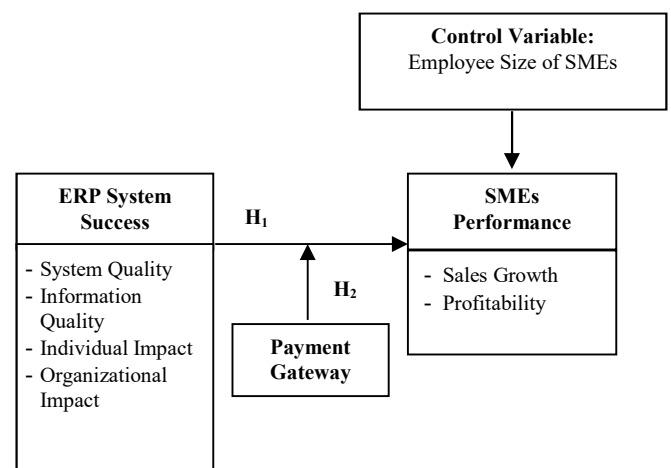


Figure 1. Research Model

In addition, Payment Gateway as a moderator variable and Employee Size of SMEs as a variable control which is a special variable and as a novelty research in developing a model of improving the performance of SMEs Indonesia.

2.6 Hypothesis Development

This research model is tested across three hypotheses. The development of this hypothesis to answer the problems in this study. Some previous studies have shown that there is a significant influence between the success of ERP System and organizational performance. Implementation of a successful ERP system will directly affect the company's performance [39]. The success of ERP System also has an effect on managerial and operational in organizational performance and many aspects in overall company performance [40][41]. Thus, in this study can be developed the hypothesis:

1. **H1:** *ERP system success has a significant impact on SMEs performance*

2. Payment Gateway is a new technology will be able to overcome market demand and support the ERP systems that ultimately can to improve the performance [17]. Thus, it can be expressed the development of the hypothesis:

3. **H2:** *ERP system success has a significant impact on SMEs performance moderated by the payment gateway*

Several studies have shown that employee size of SMEs has an effect on SMEs performance [18],[19],[20], and the firm size has a positive effect on profitability as part of company performance [42]. In this research will investigate SMEs performance taking into consideration the employee size as a variable control.

2.7 Sample and Data Collection

The research model of this study was tested with the use of a newly developed questionnaire on a sample of Indonesian SMEs that have implemented an ERP system in their business with using payment gateway as a payment system. Therefore, in this study, there were 100 prospective SMEs samples with Convenience Sampling. Totally, 100 questionnaires were returned, and after realizing all necessary controls 63 were used for data analysis (data analysis was conducted with the use of the statistical packages SPSS 17.0 and smartPLS 3.0. The 63 returned questionnaires represent a very satisfactory response rate of 63 percent. The majority of the respondents (47.64 %) preferred to use “C” classification packages of ERP system for their business. The majority of the SMEs sample is 32 percent medium-sized enterprises, while 31 percent is small size enterprises. According to the previous research conducted by Hill (1998) stated that sample size between 30 to 500 can be used in research.

2.8 Data Analysis

The five-point Likert scale was used for the measurement of all variables (1 “strongly disagree” to 5 “strongly agree”). Especially, to analyze the effect of control variables on SMEs performance by using the Random Effect Model [14] is used in this study. The dependent variable is the SMEs performance, which reflects the results of the study. ERP system success, as a variable independent, payment gateway as a moderating variable and employee size of SMEs as a control variable in this study. Analysis of the effect of control variables on SMEs performance by using the Random Effect Model [20] is used in this study.

III. RESULT AND DISCUSSION

3.1 Analyze the Result of Research

The measuring of validity and reliability, the study determined the value of Average Variance Extracted (AVE). For all indicators had a loading factor greater than 0.50 (Table 1), suggesting they were valid for measuring their constructs. In measuring reliability, the researchers calculated a Cronbach’s Alpha and Composite Reliability greater than 0.7, which showed that all variables met the reliability requirements. Then, once the measurement model finds the elements of validity and reliability, the model was executed using bootstrapping with Smart-PLS tool [43].

Table 1 Result of Validity and Reliability

Construct	Average Variance Extracted	Cronbach’s Alpha	Composite Reliability	rho_A
ERP System Success	0.572	0.895	0.913	0.910
Payment Gateway	0.638	0.717	0.841	0.638
Moderating Effect 1	1.000	1.000	1.000	1.000
SMEs Performance	0.589	0.858	0.895	0.870

3.2 Discussing The Results of Hypothesis Testing

H1, As shown in Table 2, the measurements included a coefficient value beta of 0.351 and a T-statistics value of 2.481, thus, indicating ERP System Success has a significant effect on SMEs Performance. These findings support those of previous studies [11],[12],[44].

Table 2 Results of Measurement Model

Variables	Original Sample	T-Statistic	P-Values
ERP System Success → SMEs Performance	0.351	2.481	0.006
Moderating Effect → SMEs Performance	0.150	5.635	0.000

The result of H2, which suggests that the relationship between payment gateway as a moderator variable and SMEs performance, which has a positive value, means that Moderating Effect strengthens SMEs performance, but it is

not significant ($p\text{-value} > 0.05$). This result shows that SMEs in Indonesia are not yet ready to take advantage of payment gateway and that this service cannot yet improve SMEs performance. Table 3 shows that the effect of ERP System success on SMEs performance without moderation by payment gateway (path coefficient = 0.351) is greater than the effect of ERP System success on SMEs performance with moderate. payment gateway (path coefficient = 0.150). Thus, payment gateway has failed to moderate the ERP System and reduce its influence on SMEs performance among SMEs business in Indonesia. This result shows that payment gateway has not been able to significantly affect the performance of SMEs. It is also caused by Indonesia SMEs are not yet ready for use new technology ^[16].

Table 3 Results of Moderating Variable

Path	Original Sample	Moderating Variable
ERP System Success → SMEs Performance	0.351	Not Moderated
ERP System Success* Payment Gateway ← SMEs Performance	0.150	Moderated

The result of this research to determine the effect of employee size as a control variable on SMEs Performance. The result concerning the size of SME in the Random Effect model is supported at the statistically significant level of 5% ($p < 0.05$). Random Effect (RE) model is able to save the degrees of freedom, thereby maintaining the power of the statistical tests ^[20].

Table 4 Results of RE Model for Control Variable

Dependent Variable : SMEs Performance (SP)				
Method : Variance Components				
Variable	Coefficient	Std. Error	T-Statistic	Prob.
(Constant)	0.858	0.472	1.818	0.074
Sales Growth (SG)	0.983	0.397	2.474	0.016
Profitability (PF)	0.951	0.399	2.383	0.020
Employee Size (ES)	1.001	0.002	511.861	0.000
Adjusted R-squared	0.993			

Therefore, we consider employee size of SMEs as a control variable in the RE model. Based on the results of data

processing (Table 4), obtained the model equation of SMEs performance (SP_{it}) by entering the variable as follows:

$$SP_{it} = 0.858 + 0.983SG + 0.951PF + 1.001ES + \varepsilon_{it}$$

While the sales growth (SG) regression coefficient shows a significant probability value of $0.016 < 0.05$. The profitability regression coefficient is significant, ie $0.020 < 0.05$ and has a positive direction. The regression coefficient employee size of SMEs has a significant probability value, that is $0.00 < 0.05$. Thus, it can be concluded that from the estimation result with the random effect method, the regression coefficient of SG and PF influence the SMEs performance positively, while ES as the control variable which statistically significant influence SMEs performance is employee size. This finding is in line with findings of previous studies ^{[18],[19],[20]}. These studies indicated that the key features of a medium enterprise of SMEs are its diverse capabilities, its ability to exploit economies of scale and the formalization of procedures.

3.3 Reveals results findings that refer to the objectives of the study

First, IT adoption efforts in the success of ERP systems that support the improvement of organizational performance. This IT Adoption can be an important factor for future growth and success for SMEs in the long term. Second, then payment gateway results have failed to moderate the ERP system and reduce its impact on the performance of SMEs. This also proves that Indonesia SMEs are not yet ready in using a new technology.

Finally, the employee size as a control variable that has a statistically significant effect on the performance of Indonesian SMEs. Employee size of SMEs needs to be considered in achieving the IT Adoption efforts through the success of the ERP system and implementation of new technology further impact on the performance of SMEs.

3.4 Implications

Theoretically, the ERP system and payment gateway approach in conducting Information System theory and based on financial technology concepts contribution to the decision-making accurately in a modern organization that is highly dependent on information and communication technology.

For owners and managers of SME owners the need for careful consideration in making IT adoption more efficient, the results of this study enable their business organizations implementing the ERP system success and payment gateway as new technologies will improve SMEs performance.

3.5 Limitations

This study has some limitations. First, this study does not discuss the factors that affect the success of ERP systems, such as business strategy or organizational resources. Precisely, how to integrate the ERP system with a payment gateway. Second, the present study has limited by the relatively small size of the sample. And third, the questionnaire approach is not free to form the subjectivity of the respondent.

IV. CONCLUSION

This paper proposes to develop the concept of IT Adoption efforts in improving the performance of Indonesian SMEs.

The results of this research showed that (1) IT adoption efforts through the success of ERP System Success has impact on Indonesian SMEs performance. (2) Implementation of payment gateway payment gateway has not been able to significantly affect the performance of SMEs, and (3) Employee Size as the control variable which statistically a significant impact SMEs performance.

In the future of research, we intend to develop the future research model more accurately by using other factors have influenced the ERP System success.

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