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The Balanced Scorecard Approach to Assess the Influence of ERPS and SCM Usage with Strategic Alignment as a Moderator

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ABSTRACT

The purpose of this research was to examine whether the Enterprise Resource Planning System (ERPS) usage by Indonesian companies affected the firm performance based on the balanced scorecard approach directly or moderated by strategic alignment. This research also assessed the performance between companies that applied ERPS with Supply Chain Management (SCM) and the companies applying ERPS without SCM. Data collection was conducted from October 2010 to April 2011 using questionnaires sent to respondents by e-mail and directly to the company. The sampling method used was convenience sampling by visiting companies in the survey. The final number of samples were 63 companies. Data analysis was conducted by using Structural Equation Model (SEM). The results show that ERPS usage directly affects firm performance as measured by the balanced scorecard that includes financial perspective, customer perspective, internal process perspective, and learning and growth perspectives. Moreover, the strategic alignment has been proven as a moderating variable in the relationship between ERPS usage and the firm performance. Finally, the modules addition such as SCM significantly affects the firm performance.

Keywords: Enterprise Resource Planning System (ERPS), strategic alignment, balanced scorecard, Supply Chain Management (SCM)

INTRODUCTION

Business applications that have been widely used today are Enterprise Resource Planning System (ERPS). This term is used to describe a form of software that can integrate all business functions. ERPS can streamline the flow of information from various departments or functions within the company. Integrated data allows companies to manage all the data spreading across multiple business units, so it adds value to business processes (Su & Yang, 2010a; Cebeci, 2009). With the integrated systems such as ERPS, business transactions, which consists of many subsystems such as the revenue cycle (sales, billing, accounts receivable, cash receipts), the expenditures cycles (purchases, debt, debt payments), production systems (planning, control, cost accounting), and ledgers and reporting systems business (financial statements, management reports) can be integrated through the database system.

ERPS usage has resulted in a radical change in the enterprise information system because the system is integrally connected through workflow automation and a centralized database. Information is collected and disseminated in a timely manner to the managers to enhance the manager's ability in decision making (Lewandowski, Salako, & Garcia-Perez, 2013). Integrated and standardized information systems and an automated transaction are expected to process more efficiently and reduce the financial reporting cycle length. It can allow the company to spread information more quickly other than enhancing information quality through internal control effectiveness (Morris, 2011).

ERPS usage in Indonesia has shown

considerable growth. For example, SAP users reached more than 250 companies in 2009. The numbers were more significant than in 2008 (Kompas, 2009). Moreover, according to a report from International Data Corporation (IDC) research institute, the market size of ERP solution adoption in Indonesia reaches the US$40 million to the US$50 million per year (Detiknet, 2010). Likewise, rapid market growth during the economic crisis of 2009 for ERP products in Indonesia has been reported (Metrodata, 2009).

This progress induces to the need for empirical evidence about the benefits of using ERPS. Thus, it is interesting to study whether a large investment in ERPS has given benefits to companies or not. This research is conducted on companies with the head office or branch office in Jakarta. Although the research of ERPS has been done previously outside Indonesia, this topic has never been done before in here. Given the rapid growth of today in ERPS spending, it is necessary to evaluate the impact of the empirical usage of ERPS and SCM.

Various researches on the benefits and performance of the company have done. However, the results do not present a clear conclusion (Al Dhaafri & Al Swidi, 2013). Their results showed that other variables mediated the relationship of the system implementation and firm performance. Furthermore, previous research applies various measurements to assess the performance. One of the prevailing measurements is using a balanced scorecard done by Chang, Yen, Ng, Chang, and Yu (2011). They have tried to quantify the benefits of implementing ERPS through the balanced scorecard.

Balanced scorecard approach is believed to be more comprehensive in measuring the benefits of ERPS implementation rather than the assessment of financial indicators which reflect past performance only. Moreover, the balanced scorecard approach provides a comprehensive perspective and evaluates the performance of the ERPS simultaneously (Fang & Lin, 2006). Furthermore, Fang and Lin (2006) revealed that using the balanced scorecard approach enhanced the comprehensiveness and quality of ERP practice and raised awareness of the relevant factors.

Since its development, the ERPS has evolved in its functions. The original ERPS has not accommodated Internet-based applications. However, since the 1990s, the ERP system has been accommodating an Internet-based application. Supply Chain Management (SCM) and Customer Relationship Management (CRM) are applications that can be accommodated on ERP systems (Su & Yang, 2010b). Integrating SCM functionality in the ERP system is intended to improve the supply chain process. However, previous researches have shown different results. Su and Yang (2010a) showed that ERPS had an impact on better SCM competencies. They emphasized that operational benefit, business processes and management benefits, and the benefits of strategic IT planning from ERPS increased the competence of SCM. This is due to the integration of operational, customer relationships, and integration of control processes. Meanwhile, Crumbly and Fryling (2013) showed the ERPS only improved some business processes, but it is not in SCM. Wieder, Booth, Matolcsy, and Ossimitz (2006) also found no difference in the performance of its business processes between companies which implemented ERP with SCM and did not implement SCM. Performance of companies using SCM was significantly higher than companies that did not adopt the SCM.

The capability is defined as, "The breadth of the organization's adoption of the ERPS" (Karim, Somers, & Bhattacherjee, 2007). Measuring ERP usage becomes important because the use of multiple modules of ERPS will certainly affect the performance more than just using one type of ERPS module. Similarly, the use of cross-functional unit will affect performance more than the use of only one functional unit. Then, the usage describes the level of the ERPS that will change the management, coordination of tasks, and process integration in the organization's business units. These changes will eventually bring significant benefits to the firm performance.

Previous researches have shown that ERPS practice (reach) generates a broader positive effect on higher returns (Karim, Somers, & Bhattacherjee, 2007). In this research, the size of capabilities will follow the concept proposed by Karim, Somers, and Bhattacherjee (2007). The ERPS usage can be measured by (1) the total of functions in organizations using ERPS, (2) the number of divisions or departments that use ERPS, and (3) the total of offices that are geographically dispersed in different areas using ERPS.

In accordance with the expectations desired by the business in implementing the ERPS, this is to obtain measurable benefits. Considering the performance appraisal perspective is not merely financial, the balanced scorecard can be used. It covers an important perspective of the business process. The concept of the value chain can explain this. The business process is a sequence of activities, which operate regularly in the daily operational activities. If the whole set of business processes has reached an optimal level of efficiency, it will affect the output of the company in the form of increased productivity.

The balanced scorecard is designed to reflect future performance as a supplement to the financial measures. It reflects past performance. This approach aims to evaluate the firm performance from four different perspectives. There are financial, internal business process, customer, and the learning and growth. Balanced scorecard also describes an effort to maintain stability between short and long-term goals. It can be between financial and non-financial measures, lagging and leading indicators, and internal and external performance perspectives (Cebeci, 2009).

A comprehensive assessment of business processes for the implementation of IT in the balanced scorecard approach has been widely used mainly in the relation of IT and IS. The balanced scorecard translates all strategic objectives into the performance

identified by the company as a critical success factor of ERPS usage. The performance is subsequently translated into concrete actions of every aspect of business processes resulting from ERPS usage. Thus, the performance measurements can be carried out continuously over time for comparison (Cebeci, 2009; Grabski, Leech, & Schmidt, 2011).

This research uses the balanced scorecard concept in measuring firm performance proposed by Chang *et al*. (2011). They incorporated the improved elements in supply chain management.

Assessment of the benefits of using the ERPS is also done differently by Chand, Hachey, Hunton, Owhoso, and Vasudevan (2005), Fang and Lin (2006), and Chang *et al*. (2011). They used a balanced scorecard to measure the company benefits of ERPS implementation. This was done because they believed that the balanced scorecard could measure the benefits of the ERP implementation more comprehensive than financial assessment. They stated that the financial measures only reflected past performance. By using a balanced scorecard measurement assessment, it will be complete and comprehensive to evaluate the performance of the ERP system simultaneously.

Based on the description, hypothesis 1 is formulated as follows:

H1 : The ERPS usage will have a positive impact on firm performance
H1a : The ERPS usage will have a positive impact on financial performance perspective
H1b : The ERPS usage will have a positive impact on customer performance perspective
H1c : The ERPS usage will have a positive impact on internal process performance perspective
H1d : The ERPSusage will have a positive impact on learning and growth performance perspective

Several strategies measure strategic alignment. First, it is through a strategy for analysis (AN) to support the decision-making process of analyzing business situations. Second, it is innovativeness strategy (IN) as the need for innovative business solutions in solving business issues that are often encountered. Third, there is an aggressiveness strategy (AG). The companies must be aggressive in the market and stay ahead of the competition. Fourth, internal defensiveness strategy (ID) is linked to achieve corporate strategy and improve operational efficiency and optimal coordination across the functions. Fifth, external defensiveness strategy (ED) refers to the development of cooperation with external parties. The most dominant indicator that describes the strategic alignment is analysis and innovativeness strategy.

In addition, based on contingency theory, contextual factors such as organizational factors (strategic alignment) also affects the company's ability to increase the value of the business in the IT investment. One of the key success factors of the use of IT, in general, is how IT can be aligned with the company's corporate strategic objectives. The company that uses IT will result in a competitive advantage by aligning IT with their business strategy (Aversano, Grasso, & Tortorella, 2012; Marrone & Kolbe, 2011; Ravishankar, Pan, & Leidner, 2011; Tallon & Pinsonneault, 2011; Dong, Liu, & Yin, 2008). Every company needs to align their strategic planning of IS or IT with their business strategy. If the alignment occurs, the use of IT can affect the firm performance. Conversely, if the IS strategy and business strategy are less aligned, the company will fail to achieve a competitive advantage in the context of investment in IT.

Previous research that examines the effect of the strategic alignment of the company's overall performance has done by Velcu (2010). Velcu (2010) analyzed the IT perspective of strategic alignment with the realization of business strategy. Moreover, Chan, Huff, Barclay, and Copeland (1997) measured the size of the strategic alignment of business strategy with Strategic Orientation of Business Enterprise (STROBE) by Venkatraman (1989) and the Strategic Orientation of the Existing Portfolio of IS (STROEPIS). Chan *et al*. (1997) showed a strong influence on strategic alignment and innovation by one of the business performance measures. The researcher supported the notion that firms with a high strategic alignment had a better performance.

Another research examines the effect of strategic alignment to the company's performance has done directly (Dong, Liu, & Yin, 2008). They showed that the alignment between business strategy and IT strategy had a positive effect on firm performance. Then, Byrd, Lewis, and Bryan (2006) used strategic alignment as a moderating variable on the relationship of IT investments and firm performance in manufacturing companies. They showed that there was a synergy in the alignment of business strategy and IT investment with firm performance. Companies that have aligned with IT and business strategies can make additional investments in IT resources and have the assurance of obtaining substantial benefits. Velcu (2010) also found that the success of ERPS is determined by the alignment of the ERP strategy and organizational strategy.

From the explanation, it can be seen that the alignment of business strategy with enterprise IS strategy plays an essential role in the successful implementation of the ERPS. Measuring the success of the implementation of the system, it can be seen from the benefits of the improvement in firm performance. Therefore, the alignment of strategy will strengthen the relationship between ERPS usage and firm performance. Thus, the of hypotheses 2 and 3 are formulated as follows:

H2 : Strategic alignment will have a positive impact on firm performance
H2a : Strategic alignment will have a positive impact on financial performance perspectives
H2b : Strategic alignment will have a positive impact on customer performance perspective
H2c : Strategic alignment will have a positive impact on internal process performance perspective

H2d : Strategic alignment will have a positive impact on learning and growth performance perspective

H3 : The greater ERPS usage and strategic alignment are positively associated with higher firm performance

H3a : The greater ERPS usage and strategic alignment are positively associated with higher financial performance perspective

H3b : The greater ERPS usage and strategic alignment are positively associated with higher customer performance perspective

H3C : The greater ERPS usage and strategic alignment are positively associated with higher internal process performance perspective

H3d : The greater ERPS usage and strategic alignment are positively associated with higher learning and growth performance perspective

Supply Chain Management (SCM) is a specialized application package that integrates all the functions of both internal and external logistics. The use of SCM enables companies integrated with suppliers and customers. SCM is a key component in the company's competitive advantage to increase the productivity and profitability (Carvalho, Azevedo, & Cruz-Machado, 2012; Holweg & Pil, 2008). This is achievable because SCM will minimize the barriers and departmental functional supply chain process. SCM facilitate companies' partner to coordinate through information sharing and interaction among companies' partner with minimal transaction costs. Therefore, it allows managers in managing their supply chain. Seeing the growth in SCM, ERPS vendors have expanded their primary function of ERPS products included SCM capabilities.

SCM integration in the ERPS is intended to improve the supply chain and emphasize greater collaboration between companies. With its capabilities that exist in integrating ERPS, supply chain functions can be performed through the integration of information flow based on database technology. The integration of data and information is expected to increase the efficiency and productivity of the company (Carvalho *et al*., 2012; Carvalho, Azevedo, & Machado, 2010; Holweg & Pil, 2008; Su & Yang, 2010b; Zhao, Huo, Sun, & Zhao, 2013). Thus, hypothesis 4 is formulated as follows:

H4 : Firm performance for ERPS users that extending their ERPS with SCM will be higher than ERPS users without SCM.

H4a : Firm performance in financial perspective for ERPS users that extending their ERPS with SCM will be higher than ERPS users without SCM.

H4b : Firm performance in customer perspective for ERPS users that extending their ERPS with SCM will be higher than ERPS users without SCM.

H4c : Firm performance in internal process perspective for ERPS users that extending their ERPS with SCM will be higher than ERPS users without SCM.

H4d : Firm performance in learning and growth perspective for ERPS users that extending their ERPS with SCM will be higher than ERPS users without SCM.

Although the research of ERPS relationships with benefits for companies has been tested before, this research differs from previous studies in using moderating variables (strategic alignment) and comparing companies with and without SCM. The underlying point of this statement is that ERPS as an application that integrates all business processes has also accommodated the planning and the control of supply and demand. Thus, the expected benefits will be more felt when the SCM is integrated into the ERPS.

Based on the description mentioned, this research will look at the benefits of the ERPS usage with the balanced scorecard approach. This is done considering that the ERPS usage will leverage all activities of the enterprise business process, especially creating efficiency in business activities. A balanced scorecard approach can accommodate overall performance measurements consisting of financial, customers, internal procedures, and learning and growth perspectives. Moreover, the balanced scorecard approach can also translate the company's vision and strategy through a series of performance indicators and connect all levels of the organization. Thus, the company will acquire strategic feedback that allows them to be more effective in managing their business. Moreover, it also assesses whether there are differences in performance between companies that adopt ERPS with and without SCM.

Given that the ERPS usage involves strategic decisions, the assessment of the benefit on the use of Information Technology (IT), will also consider the factor of strategic alignment between business strategy and organization's Information Systems (IS) strategy. Within the framework established by Dehning and Richardson (2002), they demonstrated that the business strategy was the factors that moderated the relationship between the IT usage and firm performance. Based on this framework, Velcu (2010) raised the issue of strategic alignment to assess the relationship between ERPS usage and firm performance. The results showed a positive relationship between strategic alignment and firm performance. Similarly, Kang, Park, and Yang (2008) showed a positive relationship between ERPS investment and organizational integration.

Based on the discussion, the following research question is formulated as follows. (1) Does ERPS usage affect firm performance which is measured from the perspective of financial, customer, internal process and learning and growth? (2) Is there any different performance between companies that apply the ERPS only and the companies apply the ERPS with SCM? (3) Does a strategic alignment influence the improvement in firm performance? (4) Does a strategic alignment

become a moderating factor in the relation between ERPS usage and firm performance?

METHODS

This research is an empirical study. The research subjects are companies in Jakarta which use ERPS. Because information indicating the numbers of companies that have used ERPS is not available, the sample frame of the companies using the ERPS cannot be compiled. Similarly, sampling cannot be performed as required by random sampling technique in survey research. Therefore, the sampling used in this research is a convenience sampling.

Data collection is conducted from October 2010 to April 2011. Although the data collected are in the past, the results of this research are still relevant. It is because more companies use both ERP and SCM now. Thus, the results can contribute to both empirical and practical use (Su & Yang, 2010b). This research uses survey methods by sending questionnaires to respondents by mail, e-mail, and to the company directly. From 395 ERPS user companies recorded, only 268 companies agree to do the survey.

The final result of the data collection process is as follows. First, 18 questionnaires are collected by mail and e-mail. Second, 53 questionnaires are from direct visiting. Then, the total of questionnaires is 71. However, only 63 companies can be processed. The analysis of the data is done in two stages after the non-response bias test. The first stage of the outer model shows the validity of the model. Then, the second is the inner model test to confirm the significance of the proposed structural model.

To detect the possibility of individual differences in responding, a non-response bias test is conducted. The test is done by comparing the characteristics of subjects who participate in research with those who do not want to participate. However, data on non-participating subjects cannot be known. The respondents who are late respondents are used as proxy responders for those who are not willing to participate.

Table 1 Non-Response Bias-Test

Response		Variable Description					
		ERPS	SA	KF	KC	KIP	KLG
Early N=48	Mean	33,5	32,7	32,9	32,9	33,2	33,1
Late N=15	Mean	27,0	29,7	29,0	28,8	27,9	28,3
	Probability	0,23	0,58	0,47	0,44	0,32	0,38

Using the program of SPSS 16.0, the non-response bias test with nonparametric t-test has been done. It is by dividing the respondents into two groups. Those are respondents who answer earlier (October 2010 - February 2011) and last (March 2011 - April 2011). The group that answers previously consists of 48 respondents and the group who answers late is 15 respondents. T-test is done by comparing respondent scores in each group for each variable used in the research. If the significance mean score shows that the p-value is higher than 0.05, the concluded average score does not differ between the tested groups. As shown in Table 1, the results of the non-response bias have shown p-value greater than 0,05. Thus, it indicates that there is no significant difference between the initial response and the late response. Therefore, this data can be used for further testing.

According to Karim, Somers, and Bhattacherjee (2007), the ERP Capability (ERPC) is measured by the ERP in functional (FSC), organizational (OSC), and geographic (GSC) reach. The functional reach is measured as the range of the use of the module. ERP organizational reach is measured by the total of locations (departments, divisions, the whole company, and multiple companies) targeted for ERP implementation. Then, ERP geographic reach is measured by the geographical reach of the implementation (single venue, multiple venues, and national or international place).

Based on Byrd, Lewis, and Bryan (2006), the measurement of the strategic alignment is from the combination of STROBE scale (implemented business strategy) by Venkatraman (1989) andSTROEPIS scale (implemented IS strategy) by Chan *et al*. (1997). It measures the strategic alignment from the result. The managers are asked to respond to the STROBE items and the STROEPIS items. Each value of STROBE and STROEPIS is calculated by obtaining a score difference. Then, the resulting score difference is used as an alignment. The calculation utilizes the difference in values between the corresponding factors in the two measurements. It is the reflection of the moderation value using the multiplication of the corresponding variables. The results of each average calculation across all measurement factors are used to determine the final alignment score.

Chang *et al*. (2011) proposed a model to assess the ERPS performance through four perspectives of the balanced scorecard. Thus, this research adopts the model to measure firm performance relating to ERPS usage. However, the assessment of the firm performance is based on the manager's perception as the representative of the company.

Measurement for financial perspective (KF) is done through several statements. It is regarding what extent ERPS usage has reduced costs, increased sales and profits, improved inventory turnover, and reduced the financial pay-up cycle, information engineering costs, and total cycle time. Measurement of customer perspective (KC) is done by asking how long ERPS usage is in reducing the reaction time and improving customer satisfaction, loyalty, faster delivery, and product quality.

Moreover, the internal process perspective

(KIP) sees how far the ERPS usage improves operational procedures, operational efficiency, and supply chain performance; reduces time to enter the market and repetitive operations; and simplifies work complexity. Furthermore, the learning and growth perspective (KLG) is how much ERP usage offers for the company. It can be more accurate and immediate information for decision making; the improvement of interdepartmental relationships through sharing information; enhancement of organizational productivity; improvement of corporate competitive advantage; reducement of personal information; improvement of sense of accomplishment of employees; monitor of the global operating environment; and the enhancement of the functions in information systems.

The limitation in the amount of data is the reason why this research uses an alternative method of Partial Least Square (PLS) with the help of Visual PLS. It is particularly suitable for research with small sample sizes. Moreover, the proposed model is complicated, so it is not possible to use SEM with covariance based method such as Lisrel or Amos. Another advantage is that PLS does not require the data to be normally distributed. In addition, the use of PLS is also very appropriate when both conceptual, and measurement models have not been developed or are still in the exploration stage and the development of theory (Ghozali, 2011).

Data analysis using PLS is done in two steps. First, it tests the measurement model using convergent validity and discriminant validity for its indicator. Convergent validity is assessed by looking at the reliability of each indicator, composite reliability, and the Average Variance Extracted (AVE). The second is to test the structural model. It analyzes the relationship between the constructs that have been proposed in the research hypothesis.

RESULTS AND DISCUSSIONS

The profile of the respondents is in Table 2. The total respondents obtained is 63. The most significant industry that uses ERPS in this research is the miscellaneous industry (automotive, wired, and electronic). However, about 52% of the respondents use ERPS for less than three years. Then, the most used ERPS is SAP.

Next, the result of the first step test (test of the outer model), using Visual PLS indicate that all indicators or question items used in the questionnaire can be accepted. About 36 statements indicate the value of validity and reliability. This means that the instruments are valid and reliable. Detailed explanations are presented in Table 3.

Then, using Visual PLS 1.04bi, the program output generates a loading factor value greater than 0,6 for all items except for OSC (ERP indicator), PR, RA, FV (SA indicator), and KIP2 and KIP5 (KIP indicator). Thus, the rest of the items indicators can be used in the next stage. Based on the output generated by Visual PLS 1.04bi, the value of factor loading for the first stage is presented in Table 3. After that, the factor loading indicator that has a value less than 0,6 is removed from the analysis in the first stage. The next step is recalculating all valid indicators in the first phase. The results of the new loading factor values for all 30 indicators are shown in Table 3.

Table 2 Respondent Profile

Industry Type	**Total**	**%**
Agriculture	3	5%
Mining	4	6%
Industry and chemicals	7	11%
Miscellaneous industry (automotive, wired, electronic)	15	24%
Consumer goods industry	8	13%
The property, real estate, and building construction	9	14%
Infrastructure, utilities, and transportation	8	13%
Trade, service, and investment	9	14%
Total	63	100%
Employee	**Total**	**%**
< 50	4	6%
50 - 100	6	10%
101 - 500	20	32%
501 – 1000	12	19%
1001 - 5000	16	25%
> 5000	5	8%
Total	63	100%
Experience	**Total**	**%**
<3 year	33	52%
3 - 5 year	10	16%
5 - 10 year	10	16%
10 - 15 year	6	10%
>15 year	4	6%
Total	63	100%
Position	**Total**	**%**
Director	6	10%
Manager	57	90%
Total	63	100%
ERP Vendor	**Total**	**%**
IFS	6	10%
MS Axapta	1	2%
Oracle	8	13%
Peoplesoft	3	5%
SAP	26	41%
Others	19	30%
Total	63	100%

Table 3 Convergent Validity

Phase I			Phase II		
Construct	Indicator	Loading	Construct	Indicator	Loading
ERP	OSC	0,4563	ERP	GSC	0,6657
	GSC	0,6953		FSC	0,9325
	FSC	0,9083			
SA	PR	0,0816	SA	ID	0,6868
	RA	-0,1089		AG	0,7945
	ID	0,6954		ED	0,7127
	FV	0,5451		AN	0,9012
	AG	0,7707		IN	0,8362
	ED	0,7062			
	AN	0,8907			
	IN	0,8326			
KF	KF1	0,8197	KF	KF1	0,8189
	KF2	0,8414		KF2	0,8353
	KF3	0,6240		KF3	0,6305
	KF4	0,7950		KF4	0,8048
	KF5	0,7918		KF5	0,7912
	KF6	0,7849		KF6	0,7811
KC	KC1	0,8240	KC	KC1	0,8274
	KC2	0,8810		KC2	0,8783
	KC3	0,8896		KC3	0,8930
	KC4	0,8955		KC4	0,8921
KIP	KIP1	0,8746	KIP	KIP1	0,8861
	KIP2	0,5645		KIP3	0,7714
	KIP3	0,7655		KIP4	0,7748
	KIP4	0,7589		KIP6	0,7681
	KIP5	0,5551			
	KIP6	0,7779			
KLG	KLG1	0,8468	KLG	KLG1	0,8450
	KLG2	0,8171		KLG2	0,8166
	KLG3	0,8661		KLG3	0,8693
	KLG4	0,8532		KLG4	0,8444
	KLG5	0,6106		KLG5	0,6104
	KLG6	0,8623		KLG6	0,8709
	KLG7	0,8685		KLG7	0,8609
	KLG8	0,8843		KLG8	0,8874
	KLG9	0,7944		KLG9	0,8031

Next, the researcher analyzes the discriminant validity. As indicated in the test results on cross-loading values can be seen in Table 4, the entire values of loading factor in each indicator are greater than the size of the other constructs. Thus, it can be said that any latent constructs can predict the block's measurement better than in other blocks. Therefore, the measurement of the research model has good discriminant validity. The second assessment is done by looking at the ratio of the square root value of AVE of each construct. It is with the correlation between the constructs in the model. Visual PLS calculation results for AVE is presented in Table 5.

Table 4 Crossloading

Scale Items	ERP	SA	INT	KF	KC	KIP	KLG
GSC	**0,666**	0,162	(0,047)	0,243	0,187	0,224	0,173
FSC	**0,943**	0,304	(0,036)	0,472	0,395	0,420	0,437
ID	0,158	**0,687**	0,529	0,384	0,440	0,443	0,433
AG	0,294	**0,795**	0,452	0,337	0,425	0,413	0,329
ED	0,218	**0,726**	0,083	0,361	0,424	0,367	0,270
AN	0,298	**0,913**	0,518	0,529	0,561	0,621	0,551
IN	0,236	**0,851**	0,460	0,480	0,485	0,511	0,446
KF1	0,455	0,432	0,258	**0,825**	0,658	0,600	0,621
KF2	0,372	0,565	0,365	**0,846**	0,852	0,747	0,817
KF3	0,337	0,272	0,192	**0,644**	0,403	0,464	0,476
KF4	0,324	0,279	0,354	**0,811**	0,686	0,654	0,726
KF5	0,392	0,456	0,330	**0,802**	0,635	0,671	0,790
KF6	0,347	0,461	0,307	**0,791**	0,757	0,625	0,612
KC1	0,269	0,437	0,379	0,791	**0,837**	0,752	0,808
KC2	0,410	0,540	0,312	0,797	**0,891**	0,801	0,783
KC3	0,350	0,534	0,453	0,722	**0,906**	0,778	0,703
KC4	0,323	0,573	0,334	0,743	**0,905**	0,719	0,702
KIP1	0,363	0,643	0,541	0,669	0,673	**0,898**	0,722
KIP3	0,288	0,461	0,360	0,693	0,847	**0,771**	0,742
KIP4	0,412	0,383	0,354	0,527	0,609	**0,787**	0,502
KIP6	0,293	0,435	0,464	0,707	0,681	**0,768**	0,767
KLG1	0,386	0,460	0,381	0,786	0,736	0,661	**0,837**
KLG2	0,265	0,444	0,423	0,746	0,743	0,723	**0,811**
KLG3	0,272	0,416	0,467	0,752	0,765	0,762	**0,863**
KLG4	0,408	0,558	0,410	0,862	0,884	0,814	**0,837**
KLG5	0,399	0,322	0,266	0,542	0,476	0,622	**0,604**
KLG6	0,317	0,378	0,498	0,710	0,696	0,733	**0,867**
KLG7	0,387	0,604	0,441	0,794	0,848	0,799	**0,853**
KLG8	0,379	0,457	0,482	0,741	0,735	0,773	**0,880**
KLG9	0,309	0,339	0,399	0,663	0,545	0,556	**0,795**

Table 5 Reliability and AVE

Construct	Composite Reliability	AVE	√AVE
ERP	0,788	0,656	0,810
SA	0,892	0,624	0,790
KF	0,902	0,608	0,780
KC	0,928	0,762	0,873
KIP	0,878	0,643	0,802
KLG	0,951	0,684	0,827

A comparison between the values of the square root of AVE and correlations between the construct is in Table 6. It can be seen that the value of the square root of AVE in each construct was greater than the correlation between the constructs. It can be said that the model has a good discriminant validity value (Fornell & Larcker, 1981).

Table 6 Square Root of AVE
and Correlations Between Constructs

	ERP	SA	KF	KC	KIP	KLG
ERP	**0,810**					
SA	-0,302	**0,790**				
KF	-0,468	0,534	**0,780**			
KC	-0,384	0,591	0,855	**0,873**		
KIP	-0,419	0,605	0,798	0,859	**0,802**	
KLG	-0,414	0,534	0,878	0,860	0,855	**0,827**

Next, the researcher assesses the composite reliability. Composite reliability is a measure that shows a good internal consistency of a reflexive indicator. The assessment is done by looking at how the value is generated for composite reliability. If the composite reliability value is greater than 0,7, it indicates that the model has excellent internal consistency. Visual PLS output in Table 5 describes all constructs in composite reliability have the value above 0,7. It shows that all constructs have good internal consistency. All measurement results of the model point out that the indicators meet the assessment criteria. Thus, all revised indicators can be used to test hypotheses and have high reliability.

The test results of the measurement model confirm that the independent variable (ERP) can be measured using the geographical reach of ERP usage and functionally by the number of modules that are applied. The results of the measurement model provide support that the dependent variable (firm performance) can be measured by the balanced-scorecard approach perceived by the user (financial perspective, customer perspective, internal process perspective, and learning and growth perspective). Furthermore, business alignment variables with IT represented by STROBE and STROEPIS can be used to assess the alignment.

After testing the measurement model (outer model) in the first steps that have resulted in an adequate value of validity and reliability, the second stage is testing the structural model (inner model). The test is done by assessing the relationship between constructs as stated in the hypothesis of this research. Visual PLS produces two types of information about how the predicted structural model is and the relationships that have been hypothesized. The information is shown from the value of R square. In this stage, R square value is a tool for the goodness fit model test which explains the percentage of variation in all model constructs.

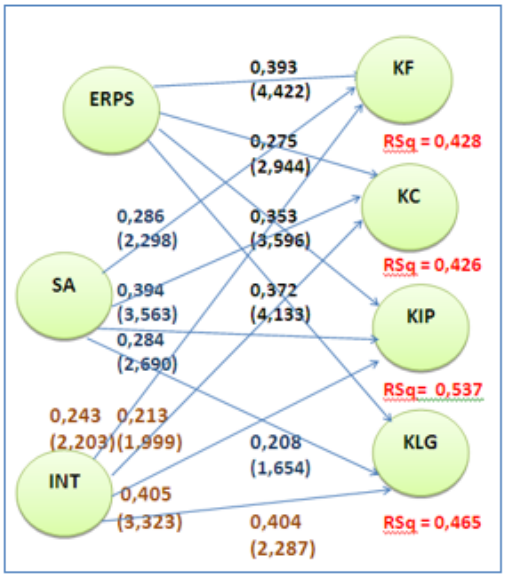

Figure1 Firm Performance Model
in Balanced Scorecard Approach

The inner model test is performed using a bootstrapping method of 500 samples. The result is in Figure1. It shows that the result of R-square values for endogenous variables of KF (0,428), KC (0,426), KIP (0,537), and KLG (0,465). This means that two exogenous variables such as ERPS and strategic alignment as well as interaction variables have 42,8% variation in KF, 42,6% in KC, 43,7% in KIP, and 46,5% in KLG. This value indicates average explanatory power greater than 33,3% (Chin, 1998).

The next information is obtained through the value of the parameter coefficient and the significance of the t-statistic value to test the hypothesis. Using the Visual PLS output summary in Figure 1, it describes the entire path coefficient value. It indicates the strength of the relationship between the two constructs. It appears that all path coefficients provide significant value (p=0,05) except the path coefficients of strategic alignment to KLG with coefficients of 0,208, and t-values less than 1,96 (1,654), and insignificant at p=0,05. Meanwhile, the remaining path coefficient shows t-value is higher than 1,96, significant at p=0,05. Thus, it can imply that all hypotheses except H2d are acceptable.

Significant results suggest that the more extensive the ERPS usage, in particular, the functional reach, will provide a higher influence on the firm performance. It measures the financial perspective (increasing the business volume and profits), customer perspective (more immediate delivery), internal process perspective (improving the performance in operational procedure), and learning and growth perspectives (helping to monitor the global operating environment).

The result also shows that AN has a positive effect on firm performance. The higher the value in strategic alignment (fit between business strategy and IT strategy) is, the higher the impact on firm performance will be. It is measured from the financial perspective, customer perspective, and the internal process perspective. The element of the strategic alignment of business strategy is intended for the analysis which provides sufficient facts and information in enterprise information systems to develop a detailed analysis of the state of the business.

The analysis also shows that strategic alignment has a moderating impact on the relationships between ERPS usage and firm performance. This means that the higher the strategic alignment between business and IT/IS strategy is, the greater impact of the ERPS usage to the firm performance will be.

The results of the test with SPSS 16.0 are presented in Table 7. It shows no difference in the strategic alignment and interaction variable. However, the result from t-test shows there is a significant difference in the ERPS usage, KC, KIP, and KLG. The mean in the test results with non-parametric tests (Mann-Whitney test) has shown that ERP capability, strategic alignment, and all performance perspective in the balanced scorecard are higher in companies with SCM than without SCM.

Table 7 Mann-Whitney Test Result

Grouping Variables: ERPS usage SCM n=33 ERPS without SCM = 30	ERP	SA	INT	KF	KC	KIP	KLG
Mann-Whitney U	201,5	382	419	291	285	259	269,5
Wilcoxon W	666,5	847	980	756	750	724	734,5
Z	-4,041	-1,555	-1,046	-2,808	-2,895	-3,249	-3,104
Asymp. Sig. (2-tailed)	0	0,12	0,296	0,005	0,004	0,001	0,002
Mean of ERP with SCM	40,89	35,42	29,70	38,18	38,36	39,15	38,83
Mean of ERP without SCM	22,22	28,23	34,53	25,20	25,00	24,13	24,48
Grouping Variables: ERPS usage SCM n=33 ERPS without SCM = 30	ERP	SA	INT	KF	KC	KIP	KLG
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Z	-4,041	-1,555	-1,046	-2,808	-2,895	-3,249	-3,104
Asymp. Sig. (2-tailed)	0	0,12	0,296	0,005	0,004	0,001	0,002
Mean of ERP with SCM	40,89	35,42	29,70	38,18	38,36	39,15	38,83
Mean of ERP without SCM	22,22	28,23	34,53	25,20	25,00	24,13	24,48

Tabel 8 ERP Capabilities

Description	**SCM**	**Without SCM**	**Total**
Organizational Reach (OSC)			
Departement	3	8	11
Division	2	2	4
One company	19	19	38
Several companies	9	9	18
Geographic Reach (GSC)			
Single venue	7	8	15
Multiple venue	8	9	17
National	7	15	22
International	11	6	17
Functional Reach (FSC)			
Accounting/finance	33	36	69
Operation	33	32	65
Human resource	27	23	50
Accounting/finance +operation	6	10	16
Accounting/finance + operation + human resource	11	6	17

As shown in Table 8, ERP capabilities have a relative low on ERPS usage. There are only 17 companies that use a complete module (functional reach). Then, 18 companies have some coverage (organizational reach). About 17 companies have coverage for multinational usage (geographic reach).

Statistics results show a positive relationship between the ERPS capabilities with all performance components of the balanced scorecard. This suggests that the performance of the company as measured by the balanced scorecard is affected by the competence of the ERPS. The higher the ERPS usage by the companies is, the greater impact on firm performance as measured by all balanced scorecard perspectives (financial, customer, internal process, and learning and growth perspectives) will be. The indicators that give the greatest influence on the performance are increasing the business volume and profits (financial perspective), and more immediate delivery (customer perspective), improving the performance in the operational procedure (internal process perspective), and helping to monitor the operation of global environment (learning and growth perspective). The t-test results also show that between ERP users using SCM and not using SCM, gives different results on performance measures. It is in the customer perspective, internal process perspective, and learning and growth perspective. Meanwhile, the financial perspective shows no difference between the two types of companies.

These findings support Wieder *et al*. (2006) that companies have to adopt additional modules such as SCM. It is to enjoy the performance of the business processes better. The difference in results is possible because of differences in the measurements taken. Therefore, according to Chand *et al*. (2005), Fang and Lin (2006), and Chang *et al*. (2011) to measure the IT usage is not solely based on financial measures that only reflect past performance. The measurement should reflect the future performance of performance through a balanced scorecard approach. With a balanced scorecard approach, the assessment of the implementation system can be measured more comprehensively. It can evaluate the performance of ERPS simultaneously compared to only financial measurement assessment.

Strategic alignment mainly AN gives a significant influence on the performance of the company directly. It is measured by financial perspective, customer perspective, and internal process perspective. For the learning and growth perspectives, it does not have significant influence. However, the entire indicators of the strategic alignment have a moderating influence on the whole balanced scorecard. It can be concluded that the strategic alignment can be used as a moderator in the system implementation and corporate performance. The more aligned the company business strategy and IS/IT strategy is, the more influence on the relationship between the ERPS and firm performance will be.

This empirical result is consistent with the contingencies theory. Strategic alignment is an expected conditional factor to strengthen the relationship between the ERPS usage and firm performance. The alignment between enterprise information systems strategy and business strategy will be the factors that moderate the relationship between ERPS usage and firm performance. These findings support the results of Byrd, Lewis, and Bryan (2006). They showed that there was a synergy in strategic alignment and IT investments with corporate performance. Moreover, it indicates that these items are measured by the different scores between the variables STROBE adopted and STROEPIS from Byrd, Lewis, and Bryan (2006) and Chan *et al*. (1997). It can give a reasonable explanation regarding the construct of strategic alignment betweenERPS usage and firm performance.

CONCLUSIONS

The primary objective of this research is to investigate the impacts of ERPS usage on firm performance. It is measured through the balanced scorecard approach from the financial perspective, customer perspective, internal process perspective, and learning and growth perspectives. Then, this research aims to explore how strategic alignment can be a moderator in the relationship mentioned. This research uses PLS approach in hypothesis test and independent samples test to identify the performance between ERPS users with and without SCM.

ERPS usage can follow the capability concept which consists of Functional Reach (FSC), Organizational Reach (OSC), and Geographic Reach (GSC). The capability is defined as the extent of the ERPS used by the company. ERPS usage can be measured through the cross-functional range or from the number of types of the modules used. The number of types of the modules represents the functional reach using ERPS. It can also be measured using the geography covered by ERPS and the extent of organizational coverage connected by the ERPS. However, the strongest explanations are generated from the functional range.

ERPS usage also can positively impact the firm performance as measured by financial perspective, customer perspective, internal process perspective, and learning and growth perspectives. In addition, there is a significant difference in the performance between ERPS user with and without SCM.

Moreover, strategic alignment is proven as a moderating factor in the relationship between ERPS usage and firm performance.

Overall, it can be concluded that the ERPS usage will affect the firm performance. This is measured by financial perspective (increasing the business volume and profits), customer perspective (faster delivery), internal process perspective (improving the performance in operational procedure), and learning and growth perspectives (helping to monitor the global environment). Moreover, the addition of the SCM and other modules significantly affects the firm performance. This result suggests that the ERPS usage

is still low in Indonesia. This opens an opportunity for the vendors of ERPS in Indonesia to know why the companies do not implement ERPS fully. Another practical implication is for ERP users. The collaboration for application integration can be done to support business activities such as SCM as long as the use of IT is aligned with the company's strategic plan.

This research has limitation. It is the low response rate to the survey so that the sample size is small. Thus the result cannot be generalized. Another limitation is the use of a perceptual measure of one respondent in each company. This can cause information bias. Therefore, the results should be interpreted carefully. Due to the limitation, the future research in enterprise system can use another method besides the survey. It should obtain the detail information about the benefits of the ERPS.

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