INFORMATION
Volume 19, Number 7(B), pp.2943-2948
ISSN 1343-4500 eISSN 1344-8994

The Level of the Enterprise Software Usage and Firm Performance: User's Satisfaction as a Mediator

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Abstract

Seeing the growth and use of Enterprise Software, it is necessary to obtain empirical evidence about the benefits of using ES in the company. This research is aimed to investigate whether the Enterprise Software usage by Indonesian companies affects the firm's performance is directly or indirectly mediated by the end user's satisfaction. Data analysis was conducted by using the Partial Least Square (PLS) method and Hayes's calculation in testing the mediation effect. The result had showed that the level of the use of the Enterprise Software directly influenced the firm's performance with the end user satisfaction as a mediating variable in the relationship between the level of the Enterprise Software (ES) usage and the firm's performance.

Key Words: Enterprise Software (ES), Enterprise System, Enterprise Resource Planning, User satisfaction, firm's performance

1. Introduction

Looking at the growth and use of Enterprise Software, it is necessary to obtain empirical evidence about the benefits of using ES in the company. Research on the extensive use of ES associated with user's satisfaction has not yet been done by previous researchers in the field of ES. Most of ES studies focused on the impact of the use of ES on firm's performance. Several previous studies had been conducted to examine the effects of the use of ES, as seen from the differences in performance before and after the implementation of the ES [8, 14, and 13]. Their results had not provided a clear conclusion about the outcome or different performances among researchers. On the other hand other studies had been conducted [2, 3, 6, 5] and had concluded that other variables that mediate the relationship were needed.

Previous studies had shown a relationship between the integrated system usage with the perception of the effectiveness of the information system [7, 15]. However, instruments that measure the perception of the effectiveness of the information system were adopted from the end-user computing satisfaction instrument (EUCS). Therefore variables measuring user's

satisfaction with EUCS will be used as a mediating variable in this study to test the effect of the use of ES by the company on the company's performance.

2. Theoretical Framework

Previous empirical studies had showed different results about the effect of the use of IT on business performance. Most studies [2, and 4] had showed a positive impact on the performance of IT investments, but other studies had not showed a positive impact on the profitability or productivity [8, 3, 6, 5, and 14]. The reason submitted by researchers to address the differences in the results of these studies generally referred to a concept of the conversion process that needed to be done toward IT investment in order to deliver improved performance [11].

In addition, different results may be caused by differences in the extent of IT usage by companies [4]. Therefore, this study will consider the extensive ES usage, considering that the extent of the ES usage will differ between companies. Differences in the scope of the use of ES among companies will of course produce different authorities in the activities of the dissemination of information, especially in the problem solving and decision making process. In addition, the use of systems with limited integration will affect the speed of analysis and reporting.

Inspired by the concept of the conversion process on IT investments in the process theory, this study will assess the relationship between the ES usage and the firm's performance through user satisfaction, in managerial and operational activities. The conversion process takes place through increased flexibility in generating information, the quality of corporate financial reporting, integration of applications used, as well as ease of maintenance of data resulting from the availability of a single database [12, 10]. User's satisfaction is assessed based on the perception of users regarding the use of IT tools to improve performance in capturing and disseminating information to the entire organization more quickly. Thus helping people do the work and make better decisions. Considering that one of the reasons for the use of ES is the integration of data, therefore the user will be able to easily access the database. Because the easy access to the database is one indicator of the effectiveness of the system, satisfaction with the effective system will enable the achievement of a better organizational performance.

The use of ES is expected to benefit the increased flexibility in generating information, improving the quality of corporate financial reporting, decision making, and maintaining easier data [12, 10]. With the perceived benefits, the resulting information can be captured

and disseminated throughout the organization more quickly. The effective processing of the information can help every individual in the organization to do the work and make better decisions.

The improvement achieved in managerial activities, especially in problem solving and in decision-making process, of course, can provide better working results. With the improvement in the decision-making process it is expected to increase the business activities and ultimately lead to competitive advantage and better organizational performance. It can be explained that the satisfaction of system user perceived through the ease of access and data interpretation will help decision makers to work effectively. Therefore, it will improve the performance of the individual or the individual decision makers in the business process. Due to the achievement of the performance of each individual, it is expected that it will help the company achieve an efficient operation and will eventually achieve the company's overall operating performance [15].

Based on the above, the formulations of the hypothesis are;

H1: The Level of use of ES (LOU) has a positive effect on company performance (CP).

H2: The Level of use of the ES (LOU) has a positive effect on the User Satisfaction (US).

H3: The User Satisfaction (US) has a positive effect on company performance (CP).

3. Methods

The data collected for this study comes from 71 Indonesian companies through a survey using questionnaires. The units of analysis are companies that are represented, each by one person. Variables used for analysis the research model are described as follows:

1. The Level of Enterprise Software Usage (LOU). This variable describes the level of use of ES by the company as measured through the functional scope, the organizational scope, and the geographical scope [4]. The third dimension is measured using a 4 scale, where 1 indicates low usage levels, and 4 for a high usage levels.
2. User Satisfaction (US), this variable is used to measure the user's perception of the extent of the output system of ES available to them to meet the information needs of decision making tasks, in particular the coordination and control activities [7].
3. Company Performance (CP), the instrument was adopted from a various studies about the effect of the use of ES on corporate performance.

Measurements for US and CP (Instrument details please see appendix) were made using a seven-point Likert scale, from 1 (strongly disagree) to 7 (strongly agree).

4. Results and Discussion

This study uses a structural equation model, but due to the small sample size, data analysis is conducted by PLS (Partial Least Squares) approach, using SmartPLS 2.0 M3 software. There are two stages of PLS analysis, which assess the measurement model (outer model) and the structural model (inner model). The measurement model is to explain the relationship between the observed variables and the size of the construct validity (i.e. how well an instrument measures what it wants to measure). Structural model is a measure that provides information about how well the theoretical models predict the path of a hypothesis or relationship between constructs.

SmartPLS program provides loading factor value, composite reliabilities, average variance extracted (AVE) for each construct (this is to asses validity and reliability of research instrument), the squared multiple correlations R^2 information for each endogenous construct and path coefficients in the model. The R^2 value indicates the percentage of variance in the model construction, while the path coefficient indicates the strength of the relationship between the constructs.

The final result indicates that all loading factor and square root of AVE shows the values that meet the assessment criteria (see appendix). Thus, it can be concluded that all indicators that have been revised are to be used to test the hypothesis. Structural model of the output SmartPLS 2.0 shows two exogenous variables, namely level of use of ES and user satisfaction that together explain 57.3% of the variation of corporate performance. This value indicates the strength of an adequate explanation although less than 67% [1]. But, the exogenous variables level of use of ES is only explained by 7.8% variation of user satisfaction. All the paths are significant at $p = 0.05$ levels, thus, hypothesis 1, 2, and 3 are acceptable. Next is to test the significance of the effect of user satisfaction as a mediation variable through a re-sampling technique, using Preacher & Hayes' script macro [9]. From the result of the calculations, it can be concluded that the proposed mediator variables, namely the user satisfaction is a mediating variable.

All the results of the analysis had indicated that the use of ES in addition to having a direct effect on the company's performance and it also indirectly effected through the mediating variables, the user satisfaction. So it can be explained that there will be a "process" in the use of IT that ultimately benefit the company. This is in line with the principle of the IT process theory, in which an IT investment will be a conversion process that will deliver improved organizational performance. Since the purpose of the use of ES is for streamlining the

processing and dissemination of information and to be able to provide support to the decision making process, then the "process" that occurred in this case is user's satisfaction in their interactions with the system. Satisfaction occurs because the system provides information quickly, accurately, clearly and accurately. Users who are satisfied with the system will do the job effectively, thus they will produce the right decisions in accordance with the needs of the organization.

The implication of this result is that the IT process theory can be used to analyze the effect of ES usage with the company's performance. Some limitations in this study are the small sample size, thus not allowing the use of random sampling so that the study results cannot be generalized. In addition, the assessment of user's satisfaction and the company's performance using the perception of only one respondent to explain all aspects of the use of ES in the organization is not sufficient. For future research, it is necessary to apply a case study method to explore a more detailed picture of the ES usage and the benefits of ES by the company.

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Appendix 1. The Measurement Model

Dimension	Measures in the questionnaire	Loading Factor	√AVE	Construct reliability
The Level of Usage Enterprise Software (LOU)	Functional scope = the number of modules used	0.907	0.851	0.973
	Organizational scope, 1= departments 2= divisions 3=entire companies 4= some companies	0.577		
	Geograpic scope, 1=single site 2= multiple sites 3=national 4=international	0.703		
User Satisfaction (US)	the ES output is presented in a useful format	0.772	0.814	0.791
	satisfied with the accuracy of the ES	0.880		
	the ES information clear	0.894		
	the ES accurate	0.799		
	the ES provides sufficient information	0.907		
	the ES provides up-to-date information	0.894		
	get the information you need in time	0.929		
	the ES provide the precise information you need	0.894		
	the ES content meet your need	0.883		
	the ES provides reports that seem to be just about exactly what you need	0.883		
	the ES user friendly	0.727		
	the ES easy to use	0.722		
	For the ES overall: control reports are provided frequently on a systematic, regular basis, e.g., daily, weekly reports.	0.845		
	For the ES overall: all in all, our Enterprise Software provides information useful for the ongoing monitoring of decisions and actions.	0.853		
Company Performance (CP)	Reduced labor cost	0.550	0.793	0.953
	Enhanced organization productivity	0.805		
	Reduced Communication cost	0.759		
	Cash management improvement	0.820		
	Revenue/profit improvement	0.723		
	Transportation/ logistics cost reduction	0.699		
	Maintenance cost reduction	0.797		
	Cost reduction	0.765		
	Enhanced organization business profitability	0.847		
	Increased company competitive position	0.852		
	Improved quality of financial reports	0.820		
	Enhanced decision making process	0.838		
	Enhanced data maintenance	0.744		

Appendix 2. Output Script MacroPreacher dan Hayes (2008)

Mediator	Bootstrap Estimate	SE	Bca 95% CI lower	Bca 95% CI upper	Z	P
US	0.3807	0.1484	0.1447	0.7358	2.2524	0.0243