

The effect of task characteristics on enterprise resource planning system success with user characteristics and organizational characteristics as mediating variables

Grace T. Pontoh^{1*}, Abdul Rahman², Deng Siraja³, Muhammad Achyar Ibrahim⁴

^{1,2,3,4}*Economics and Business Faculty of Hasanudin University, Jl. Perintis Kemerdekaan KM.10, Tamalanrea Indah, Kec. Tamalanrea, Kota Makassar, Sulawesi Selatan 90245, Indonesia*

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ABSTRACT

Enterprise Resource Planning (ERP) is an integrated system that provides a wide range of benefits for the company, but there are still many companies who have unsuccessfully implemented ERP system. This study aimed to analyze the effect of the task characteristic and the success of Enterprise Resource Planning (ERP) on the success of ERP, with the user characteristic and organizational characteristic as mediating variables. The data were collected by using a questionnaire distributed directly to users of Enterprise Resource Planning (ERP) in Indonesian companies listed in Indonesia Stock Exchange (ISE). The data were processed by using Partial Least Square (PLS). It was found that the suitability of the task significantly affects the success of an ERP system, either directly or mediated by the user variable characteristic and organizational characteristic. Task difficulty also significantly affects the success of an ERP system if mediated by the convenience variable (user characteristic). The success of the ERP system is determined by based tasks and task complexity through the system the user's convenience in using the information system.

ABSTRAK

Enterprise Resource Planning (ERP) adalah sistem terintegrasi yang memberikan berbagai manfaat bagi perusahaan, tetapi masih banyak perusahaan yang tidak berhasil menerapkan sistem ERP. Penelitian ini bertujuan untuk menganalisis pengaruh karakteristik tugas dan keberhasilan Enterprise Resource Planning (ERP) terhadap keberhasilan ERP, dengan karakteristik pengguna dan karakteristik organisasi sebagai variabel mediasi. Data dikumpulkan dengan menggunakan kuesioner yang didistribusikan secara langsung kepada pengguna Enterprise Resource Planning (ERP) di perusahaan Indonesia yang terdaftar di Bursa Efek Indonesia (BEI). Data diolah dengan menggunakan Partial Least Square (PLS). Ditemukan bahwa kesesuaian tugas secara signifikan mempengaruhi keberhasilan sistem ERP, baik secara langsung atau dimediasi oleh karakteristik variabel pengguna dan karakteristik organisasi. Kesulitan tugas juga secara signifikan mempengaruhi keberhasilan sistem ERP jika dimediasi oleh variabel kenyamanan (karakteristik pengguna). Keberhasilan sistem ERP ditentukan oleh tugas-tugas berdasarkan dan kompleksitas tugas melalui sistem kenyamanan pengguna dalam menggunakan sistem informasi.

1. INTRODUCTION

Enterprise Resource Planning (ERP) integrates all the data from any project lines in a company. Therefore, the management could see the company's overall performance and simplify their work in making decisions. Without ERP systems, large-scale enterprises, especially in this global era, will find it difficult with the number of applications, and they cannot

communicate effectively with each other. In this case, ERP is an information system that is important to be implemented because it not only supports cost control, but also it supports new product development and introductions, mergers, and other revenue growth opportunities (Nawawi, 2018).

Apart from the benefits provided by the ERP system, the statistical data of Panorama

* Corresponding author, email address: 1gracetpontoh@fe.unhas.ac.id

Consulting Solutions showed – up to the end of 2018 – there were only 42% of companies using ERP systems that have successfully benefited from the ERP system. The rest is still a failure in implementation and he did not know whether the implemented system has been successful or not. The failure was caused by several factors, namely consultants and vendors, human resources, managerial, project management, process, organizational and technical (Amid et al., 2012). Most of the failures produced by a poor selection process that ignores contextual factors of the organization (Uzoka et al., 2008). In addition to organizational factors, Sarker and Lee (2002) found that the human factor also has an important role to achieve success than other factors ERP system. Therefore, the company ERP system users should pay attention to the user code and character of the organization implementing information systems to achieve the success of information systems based on local wisdom.

Model Task Technology Fit (TTF) developed by Goodhue (1998) revealed that the duty factor also plays an important role in the success of information systems. A research by Petter et al. (2013) also showed that there are several determinants of the success of information systems. These are grouped into three groups of characteristics, namely the user characteristic, organizational characteristic, and task characteristic.

This study aims to measure the effect of task compatibility and task complexity for the success of the ERP system, either directly or mediated by a user variable characteristics and organizational characteristic. The results of this study are expected to provide empirical evidence about the influence of the task characteristics to successful systems information, in particular ERP system with user characteristics and organizational characteristic as mediating variables, so as to provide knowledge about the determinants of the success model of the ERP system. Research Peter *et al.* (2013) showed no significant relationship between task characteristic and the success of the ERP system. Mediating variables used as interrupters variable relationship between task characteristics and history of success ERP system. In addition, this research may be additional considerations for companies who are or wish to implement the Enterprise Resource Planning system technology.

2. THEORETICAL FRAMEWORK AND HYPOTHESIS

Determinants (Determinant Factor) Information System Success

The success in the organization is always attained by the company in order to achieve success in the implementation of the ERP system. In connection with the project information system, a critical success factors is what should be done by a system to meet what has been designed. In 2013, McClean, DeLone has developed his research by conducting joint research Stacie Petter to find independent variables that affect the success of an information system. The study is the literature study by comparing several scientific articles related to the success of information systems. Petter et al. (2013) find some variables that strong (strong) and the moderate influence on the success of information systems (Figure 1).

There are five variables strongly influence the overall variable success of information system according to the study Petter et al., enjoyment, trust, user expectations, extrinsic motivation, and IT infrastructure. In addition, there are eight independent variables that affect moderate to the success of information systems, which is five variables of project and organizational characteristics, that user involvement, relationship with developers, management support, management processes, organizational competence, one variable of the user and social characteristics, namely attitude towards technology, as well as two variable characteristics of the task, the task compatibility and task difficulty.

Enterprise Resource Planning

Enterprise Resource Planning (ERP) is a model of information system that enables companies to automate and integrate the core business processes (Hall, 2013: 45). O'Brien (2011: 320) defines ERP as a backbone of cross-functional company that integrate and automate many internal processes and information systems in terms of the functions of production, logistics, distribution, accounting, finance, and human resources at the company.

ERP is also defined by Dhewanto and Falahah (2007), that it is a concept for planning and managing the company's resources include funding, people, machinery, parts, time, materials and capacity that affect an area ranging from the most top management to operations in a company can be used

optimally in order to generate added value for all interested parties (stakeholders) on the company. Enterprise Resource Planning (ERP) helps to organize business processes in an integrated whole as marketing, production, purchasing and accounting and store all transactions in a database used by the company as well as provide management reporting tools (Monk and Wagner, 2009: 33).

ERP produces an integrated information that uses a single database to integrate all the information in the same time. This is why the process of planning and monitoring can be done in organizations with centralized and avoid deviation rate and to improve the consistency of the information generated.

Hypothesis

The hypotheses presented in this study are as follows.

The Effect of task compatibility on the success of the ERP system

Functions and benefits of the information system should support the activities of its users. Petter et al. (2013) in his research indicates that appropriate tasks has a significant positive effect on the success of information systems.

AS referred to the evidence above, the hypothesis can be stated as follows:

H1: Task compatibility significantly affects the success of an ERP system.

H.1a: Task compatibility significantly affects the success of an ERP system with user characteristic as a mediating variable.

H.1b: Task compatibility significantly affects the success of an ERP system with organizational characteristic as a mediating variable.

The Effect of task difficulty on the success of the ERP system

Task complexity level affects the user satisfaction system against information systems they use. The easier the task given, the more successful implementation of information systems. Research Petter et al. (2013) in their study showed a negative effect between the complexity of tasks and the success of information systems.

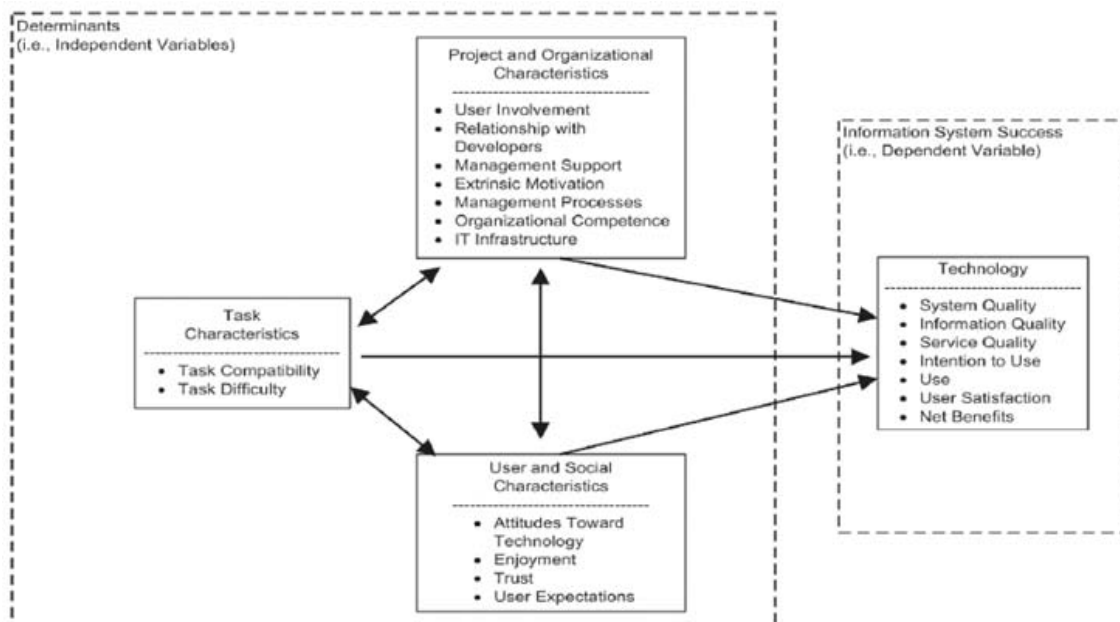
Based on the evidence above, the hypothesis can be stated as follows:

H 2: Task difficulty significantly affects the success of an ERP system.

H.2a: Task difficulty significantly affects the success of an ERP system with user characteristic as a mediating variable.

H.2b: Task difficulty significantly affects the success of an ERP system with organizational characteristic as a mediating variable.

Referring to Peter et al. (2013) and the formulation of hypotheses above, there is



Source: Petter et al., 2013

Figure 1
The Determinants of IS Success

a variable relationship. The relationship is unpredictable variables as in Figure 2.

3. RESEARCH METHODS

Research Design

This study aimed to test the hypothesis (hypothesis testing) by testing the relationship between task characteristics and the success of an ERP system with user characteristics and organizational characteristics as mediating variables. This research is correlational, namely to determine the relationship between variables. The settings is noncontrived settings, which was done on the environmental conditions in which the job was running normally. The object of research is not engineered. Thus, it is a cross-sectional study, the research is only done once during the period.

The object of this study is the enterprise ERP system users listed in the Indonesia Stock Exchange as an ERP system users in the ERP system provider. It used a non-probability sampling technique. Type of non-probability sampling is purposive sampling, the sampling technique with a certain consideration (Sugiyono, 2011: 66), in this case, are active users of the ERP system are listed in the Bursa Efek Indonesia (BEI). The number of samples in this study were 370 ERP user companies listed on Bursa Efek Indonesia (BEI).

Data and information were obtained from the respondents through questionnaires recovered from the employee ERP system users in an Indonesian company listed in Bursa Efek Indonesia (BEI).

The data were collected using also by a survey research methods, namely field research conducted against members of a population sample using a questionnaire. The questionnaire distributed to respondents in an Indonesian company listed in Indonesia Stock Exchange, then questionnaires filled out and returned to the sample in this study.

Variables and Operational Definitions

The independent variable is the task characteristics which has two sub-variables. The two variables categorized as task characteristics or task compatibility (X1) and task difficulty (X2). Compatibility is defined as the level of consistency assignment between tasks and information systems that support the task. Variable assignment suitability measured by the three-item questions used by Cho (2006). Task Difficulty is defined as the degree of the extent to which the task is supported by a challenging information systems for users. Task difficulty variable is measured with four items of the questions used by Karimi (2004).

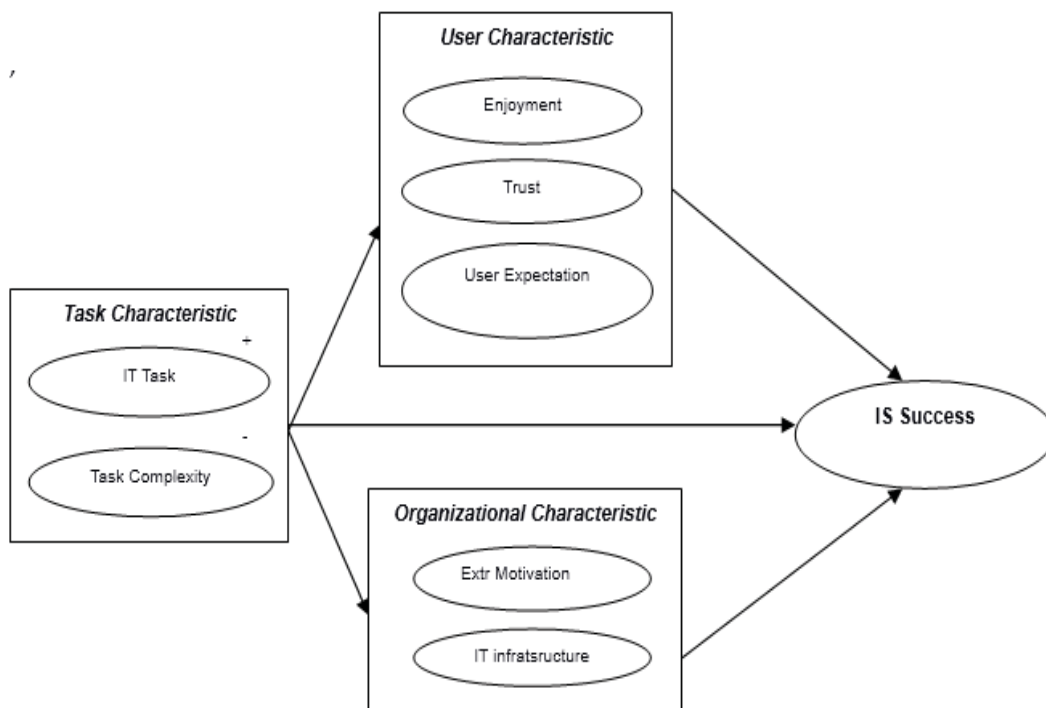


Figure 2
Research Model

The mediating variables are those that theoretically affect the relationship between dependent and independent variables into an indirect relationship and can not be observed and measured. This variable is a variable Interrupters / between independent variables and the dependent variable, so the independent variables indirectly affect the change or the emergence of the dependent variable. The moderating variables in the study are grouped into two categories, namely user characteristics and organizational characteristics. The three variables that are characteristics user categories, enjoyment (Z1), trust (Z2), and user expectations of the system (Z3). Enjoyment is defined as level of excitement or enthusiasm of someone on the use of information systems. This refers to the extent to which the activity is considered pleasant use of information systems, regardless of the consequences that can be anticipated performance (Davis et al., 1992). Variables measured comfort with a three-item questions used by Davis et al. (1992).

Trust is defined as the extent to which the individual has a positive view of the information system used. Variable confidence measured by the five-item questions used by Andrew et al. (2009). User expectations are defined as user perceptions of information systems have been consistent with the actual information system, Lim et al. (2007) define the user expectations as the level of perception regarding performance results of information systems in the future, causing the user to accept or reject the use of information systems. Variable user expectations measured by the five-item questions used by Andrew et al. (2009).

The two characteristics of organizational categories are namely extrinsic motivation (Z4) and Infrastructure (Z5) of the organization. Extrinsic motivation is defined as incentives or rewards (financial, recognition, or reputation) offered by the management of the organization to encourage users to use information systems. Extrinsic motivation is defined as the motivation that comes from outside the individual (Lawler & Porter, 1969: 163), Which means that an individual with extrinsic motivation perform a task or activity to get a reward or to avoid punishment. IT infrastructure is defined as the level of sophistication of the IT infrastructure in the company. Variable user IT infrastructure measured by the three-item questions used by Vankates and Davish (2000).

The dependent variable is the variable

that is affected or which become due, because of the independent variables (Sugiyono, 2011: 59). The dependent variable in this study is the successful Enterprise Resource Planning system and given the symbol Y. In this study, the indicators used to measure the success of an ERP system draws on research DeLone & McLean (2003), success can be measured through the information system of six indicators, namely the system quality, information quality, service quality, the use of the system, the user kepuasan, and the net benefits of the information system.

Data analysis

The data were analyzed using the program PLS (Partial Least Square). PLS is one of the Structural Equation Modeling (SEM) capable of analyzing latent variables, indicator variables and measurement error directly. Analysis of data on PLS done in three stages, namely the outer test model, the inner test models, and hypothesis testing (Sarwono and Narimawati, 2015: 18). Analysis of the model outer carried out to ensure that measurements are used suitable as measurement (valid and reliable). Testing of the model inner done to ensure that the model is built robust and accurate. Inner evaluation model can be seen from several indicators covering coefficient of determination (R²) and Predictive Relevance (Q²).

The mediating effect was tested when suspected that there is an intervening variable between independent and dependent variables. That is, the influence of the independent variable on the dependent does not directly take place but through a process of transformation represented by the mediating variables (Baron and Kenney, 1986). Mediating effect shows the relationship between independent and dependent variables through the variable liaison or mediation. There are three stages of testing the effect of mediation. First, the main effect of the test results (independent influence on a dependent) should be significant. Second, the independent variables influence the test results to the mediating variables to be significant. Finally, it dealt with the simultaneous testing of the influence of the main effects and the effect of mediating variables on the dependent variable.

If the three conditions mentioned above could be achieved, the test of the mediating effect is referred to as a full mediating effect (fully mediating).

Hypothesis significance size was measured

using a comparison value T and T -statistic table. Criteria for acceptance/rejection of the hypothesis if the t -statistic is higher than t -table value, means that the hypothesis supported or accepted. Analysis of PLS (Partial Least Square) used in this study were performed using the SmartPLS 2.0.m3 version.

4. RESULTS AND DISCUSSION

This test used two analyzes, the analysis of the inner and outer models. Analysis of the model-outer was carried out to ensure that measurements are used suitable as measurement (valid and reliable). There are two ways of testing the validity of the PLS, the convergent validity and discriminant validity. Convergent validity test in the PLS with reflective indicators assessed based on the average value diestaksi variant (average variance extracted/AVE). AVE least value of 0.5 or more. AVE value of each variable is more than 0.5 (Table 1). Discriminant validity can be assessed by measurement crossloadings to construct.

The reliability of the PLS can be tested using two methods, the Cronbach's alpha and composite reliability. Cronbach's alpha measures the lower limit value of reliability a construct and is said to be reliable if the value must be > 0.6 . Composite reliability measure real value and reliability of a construct of this method is believed to be better at estimating the internal consistency of a construct and is said to be reliable if the value must be > 0.7 .

Analysis inner models can be seen from the indicators coefficient of determination (R^2). The R^2 of the variable task compatibility (X1), task difficulty (X2), enjoyment (Z1), trust (Z2) user expectations (Z3), extrinsic motivation (Z4), and IT infrastructure (Z5) with the indicators to variable success ERP system (Y)

is 0.96. This value has meaning the influence of independent variables with the indicators for the dependent variable of 0.96.

The Test of Mediating Effect

Based on the results, it obtained a bootstrapping, suitability variable task (task compatibility) has met three conditions are fully mediating or full mediating effect. Variable conformity tasks (independent) variable berpengaruh significantly to the success of an ERP system (dependent) is by T Statistics 10.11. Variable suitability of duty also has a significant effect on the entire mediating variables, each with a value of T Statistics 7:27, 6:28, 7:05, 1.98, and 4.88.

The variable of task complexity characteristics does not meet the full criteria of mediating effect, because the independent variable has no significant effect on the dependent variable. Besides, the independent variables did not significantly affect the overall mediating variables. Therefore, the task complexity variable is not a full mediating effect (full mediating).

Hypothesis testing

The bases used in testing hypotheses in PLS is the value contained in the output path coefficients. In the PLS statistical testing every relationship hypothesized done using simulation. In this case do the bootstrap method to sample.

The total questionnaires was 30 copies distributed to the ERP in companies listed on the Stock Exchange. The number of questionnaires returned was 30 copies or 100%. Based on t -test (Table 2), it shows that the independent variables of task compatibility (X1) significantly affects the success of an ERP system. The task compatibility is 10.107235 t -count $>$ t -table 1.71714. This suggests that

Table 1
Result Analysis Test Validity and Reliability

	AVE	composite Reliability	R Square	Alpha Cronbachs	Communality
X1	0869	0964		0.95	0.86919
X2	0583	0.87		0805	0.58277
Y	0591	0969	0958	0965	0.598931
Z1	0926	0974	0464	0.96	0.925536
Z2	0.87	0971	0655	0963	0.870111
Z3	0575	0865	0697	0803	0.575326
Z4	0631	0778	0.64	0664	0.633047
Z5	0748	0922	0655	0.89	0.748512

Source: Data Processed

the suitability of the information system in assisting the user in completing a given job or task has a significant effect on the success of the implemented enterprise information systems. Variable task compatibility also have a significant positive correlation to the success of an ERP system with user characteristic (comfort, confidence, and expectations of users) as mediating variables, each with a value of t statistic 7:27, 6:28, and 7:05. Other than that,

The independent variable that is task difficulty (X2) directly does not show any significant correlation with the value of the t-statistic 0.107856 <t-table 1.71714. The results also showed the value of the t-statistic is not significant in the relationship between task complexity and the success of an ERP system with user characteristic as mediating variables, except with the convenience variable with a value of 3.58 t-statistic > t-table 1.71714. Besides the effect of the variables have an effect significantly by the the task complexity if mediated by organizational characteristic

variable with a value of t-statistic > t-table, namely 7.25 and 3.21, but with the original value of positive samples (Table 2). This shows that task difficulty does not directly affect the success of the ERP system.

Discussion result

Compliance is defined as the level of consistency assignment between tasks and information systems that support the task. Furthermore, functions and benefits of the information system should support the activities of its users Petter et al. (2013) in the model of the critical information system also includes the task compatibility as one of the factors that positively affects the success of information systems. Based on t test showed that variable task difficulty significant positive effect on the success of the ERP system directly. This suggests that the suitability of the information system in assisting the user in completing a given job or task has a significant influence on the success of the implemented enterprise

Table 2
Hypothesis Testing Analysis Results

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (Sterr)	T Statistics (O/ Sterr)	Significance
X1 (Task Compatibility) -> Y (success of ERP System)	0.857151	0.874931	0.084806	0.084806	10.107235	Significant
X1 (Task Compatibility) -> Z1 (Leisure)	1.072178	1.092206	0.147481	0.147481	7.269916	Significant
X1 (Task Compatibility) -> Z2 (Faith)	0.813667	0.826885	0.129618	0.129618	6.27741	Significant
X1 (Task Compatibility) -> Z3 (User Expectations)	0.856472	0.871805	0.121504	0.121504	7.048933	Significant
X1 (Task Compatibility) -> Z4 (Extrinsic Motivation)	0.178712	0.181619	0.090111	0.090111	1.983232	Significant
X1 (Task Compatibility) -> Z5 (IT Infrastructure)	0.541177	0.549752	0.110789	0.110789	4.884758	Significant
X2 (Task Difficulty) -> Y (success of ERP System)	0.009591	-0.00377	0.088928	0.088928	0.107856	Not significant
X2 (Task Difficulty) -> Z1 (Leisure)	-0.53729	-0.55807	0.150225	0.150225	3.576585	Significant
X2 (Task Difficulty) -> Z2 (Faith)	-0006	-0.01681	0.128352	0.128352	0.046717	Not significant
X2 (Task Difficulty) -> Z3 (User Expectations)	-0.04918	-0.0604	0.123698	0.123698	0.397542	Not significant
X2 (Task Difficulty) -> Z4 (Extrinsic Motivation)	0.626371	0.626703	0.086346	0.086346	7.254227	Significant
X2 (Task Difficulty) -> Z5 (IT Infrastructure)	0.32999	0.328194	0.102829	0.102829	3.209123	Significant

Source: Data Processed

information systems. Therefore,

Based on the analysis of hypothesis testing, the result shows that the variable of task compatibility has a significant and positive effect on the success of the ERP system with the user characteristic as a mediating variable. This suggests that the suitability of the information system in assisting the user in completing a given job or task has a significant effect on the success of enterprise information system. It should be implemented with due regard to the convenience factor, beliefs, and expectations of users of the system.

Based on the results of t-test, it shows that the task suitability has a significant and positive effect on the success of an ERP system with organizational characteristic as a mediating variable. This suggests that the suitability of the information system in assisting the user in completing a given job or task has a significant effect on the success of the implemented enterprise information systems while providing extrinsic motivation and provide an adequate IT infrastructure.

Task complexity level has an effect on the user satisfaction system against information systems. The easier the task given, the more successful implementation of information systems. The task complexity given to users of the system is one of the success factors of the information system the company uses. A study by Petter et al. (2013) showed a negative effect between the task complexity and the success of information systems. Based on the t-test, the task complexity has no significant effect directly on the success of the ERP system. This suggests that the suitability of a task directly also has no significant effect on the success of the ERP system. Also, the suitability of the task has a significant and negative effect on the success of the ERP system if the system user feels comfortable in using information system provided by the company.

5. CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

This study aimed to analyze the effect of task characteristics of the success towards the ERP system with the user characteristics and organizational characteristics as mediating variables. The model used to identify factors that influence the success of an ERP system is a critical success factor for the information system (Petter et al, 2013). This study used Partial Least Square (PLS) to analyze the relationship between variables.

First of all, task complexity has a significant and positive effect on the success of the ERP system, either directly or mediated by the users' characteristic and organizational characteristics. It therefore, supports the findings of research conducted Petter et al. (2013) stating that the positively task characteristic affects the success of information systems. The results also supports the research by Goodhue and Thompson (1995), Sanders and Courtney (1985) and Cho (2006) as they suggested there is a positive relationship between the comfort and the success of information systems. This means that the suitability of the tasks given to users of the system with an ERP system provided by the company affect the success of the ERP system.

Task complexity or difficulty directly has no significant effect on the success of the ERP system. It would have a significant effect if it is mediated by enjoyment (user characteristic). It shows the complexity level of the task has an effect on the success of the ERP system by ensuring that users of the system when implementing the enterprise information systems.

Suggestion can be asserted here such as for further study, the researchers can develop further by adding some variables related to project characteristics and social characteristics to see their effect on the success of ERP systems or other information systems. Next, further research, the researchers can also compare the previous studies using other research objects that have different systems or conduct research in more than one company with the same type of system. Finally, for the agency for the ERP system, they should pay more attention to the five determinants of the success of information systems.

Enterprise ERP system users should consider the level of suitability and complexity of the task the task given to employees by adjusting the comfort, confidence, expectations of employees. In addition, the company should provide extrinsic motivation (both financial and non-financial). They also have to provide an IT infrastructure that can improve system quality, information quality, service quality, user satisfaction, intensity of use of the system as well as the net benefit (the success of information systems) from the ERP system implemented.

This research was conducted with the various limitations of the study that could affect the study results. First, the majority of

the research object was located in a different cities. Therefore, some questionnaires were sent via email no direct contact for information. Second, this study only tested three groups of variables related to Information Systems success models of Petter et al. (2013). Yet, there are still two other variables, namely project characteristics and social characteristics that can affect the test results.

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