ERP System Success Analysis Based on SAP Applications Using Success System Information Model: Case Study PT. Adelphi Transasia Indonesia

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Abstract. This study aims to analyze the successful application of ERP systems based on SAP Applications in PT. Adelphi TransAsia Indonesia using the successmodel of DeLone & McLean information system consisting of system quality,information quality, service quality, user satisfaction, and net benefits. Dataretrieval in this study was conducted through questionnaires distributed to allemployees who in the process of working connected or using SAP applications. The analytical method used in this research is structural equation modeling usingSmart PLS Application Version 3.2.6. The conclusion of this research is Quality of System have positive and significant influence to User Satisfaction; Information Quality has positive but not significant effect to User Satisfaction; Service Quality has negative and insignificant effect to User Satisfaction and User Satisfaction has positive and significant impact to Net Benefit.

Keywords: ERP systems based on SAP Application, success model information system, structural equation modelling.

1 Introduction

The rapid development of information technology makes the company make changes in information system strategy. The company made changes not only to increase profit but also to synergize information on every division within the company. Information that has been well synergized can help decision makers in making decisions effectively and efficiently so that companies can compete with a competitor company.

One well-known concept that is a system that integrates the processes of each division within the company in a transparency and has a fairly high accountability that is the concept of Enterprise Resource Planning (ERP) [1]. While the definition of the concept of ERP is an information system intended for manufacturing companies and services that play a role to integrate and automate business processes related to aspects of operations, production and distribution in the company concern [7]. ERP concept is an integrated information system technology and used by world-class manufacturers in improving company performance. ERP concept is a system, either as a planning system, or as an information system [6].

PT. Adelphi TransAsia Indonesia is a manufacturing company engaged in food and beverages. As a company that still proceed to progress and develop PT. Adelphi TransAsia Indonesia realizes the importance of an information system for business advancement in order to achievecompetitive advantage. And to support it since 2015 PT. Adelphi TransAsia

Indonesia has implemented the Enterprise Resources Planning (ERP) concept by applying System Application and Product in Data Processing (SAP).

- What factors affect the successful application of SAP-based ERP application system at PT. Adelphi TransAsia Indonesia?
- Does the application of SAP-based ERP System provide satisfaction and support employee performance?
- Does the application of SAP-based ERP System have a positive impact on the effectiveness and efficiency of the company's business?

This research was conducted at Head Office and Factory PT. Adelphi TransAsia Indonesia located in Cikupa, Banten in all company divisions integrated with ERP system based on SAP application applied by company.

a. To test the effect of quality of SAP-based ERP system in PT Adelphi TransAsia Indonesia to user satisfaction SAP Application of PT Adelphi TransAsia Indonesia.
b. To test the effect of quality of ERP information based on SAP application in PT Adelphi TransAsia Indonesia to user satisfaction of SAP Application of PT Adelphi TransAsia Indonesia.
c. To examine the effect of the quality of ERP services based on SAP applications in PT Adelphi TransAsia Indonesia towards user satisfaction SAP Application PT Adelphi TransAsia Indonesia.
d. To examine the effect of SAP application-based ERP user satisfaction in PT Adelphi TransAsia Indonesia on the net benefits of SAP Application PT Adelphi TransAsia Indonesia.
e. In the framework of preparing the thesis for the writer as one of the requirements to obtain a Master degree of Management Postgraduate Program Budi Luhur University Jakarta.

Measurement Success Model of DeLone and McLean Information Systems. This study uses the successful model of the success of information systems that have been updated. The updated things are as follows: [3]

a. Adding service quality dimensions in addition to the existing quality dimensions.
b. Combining individual impacts and organizational impacts into one variable is net benefits.
c. Adds an intention to use dimension as an alternative to usage dimensions.

With the addition of several variables to the model, the updated DeLone and McLean model (2003) appears as follows:
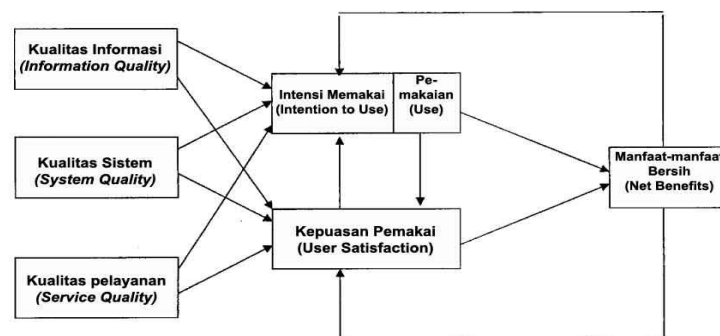

Fig. 1. Model DeLone & McLean (2003).

In this study, do not use all the variables mentioned in fig.1. Of the six variables, five variables are taken, namely System Quality, Information Quality, Service Quality, User Satisfaction and Net Benefits [8]. The author does not include Intention to Use because the application of this SAP system is a necessity and not on the basis of desire [2].

The study used variables adapted from the DeLone and McLean models of system quality, information quality, service quality, user satisfaction, and net benefits [4].

Table 1. Research Variables.

No	Variable	Indicator
1	System Quality (SQ) X1	1. Reliability 2. Usability 3. Ability to work together 4. Response time
2	Information Quality (IQ) X2	1. Relevant 2. Accurate 3. On time 4. Complete
3	Service Quality (SQ) X3	1. Reliability 2. Responsiveness 3. Assurance
4	User Satisfaction (US) Y1	1. Efficient 2. Effective 3. Satisfaction
5	Net Benefit (NB) Y2	1. Cost savings 2. Quality Improvement 3. Competitive Advantage

Source: Fendini, Kertahadi, & Riyadi, 2013; DeLone & McLean, 2003

Based on the descriptions in the sub-chapter of model development above, the following hypotheses can be assembled:

H1: Quality of SAP-based ERP System has positive effect on User Satisfaction.

H2: Quality of ERP Information based on SAP application has a positive effect on User Satisfaction.

H3: Quality of ERP Service based on SAP application has a positive effect on User Satisfaction.

H4: User SAP-based ERP application satisfaction positively affects Net Benefit.

2 Research Methodology

This research is causal explanatory relationship in the form of survey which aim to know the pattern of causal relationship between variable of System Quality, Quality of Information, and Quality of Service. Causal explanatory research can be said as testing the hypothesis testing the causal relationships among the variables studied. This study contains a proof that is built through the theory with the approach of Information Systems Success Model [3]. Data collection technique used in this research are Field research with a direct review on the employees of PT. Adelphi Trans Asia Indonesia as respondent to obtain primary data and library research with literature study to obtain useful secondary data as theoretical guidance

during field research, and to support and analyze data. This data is obtained from compulsory books, scientific journals, and auxiliary books. The location of this research is located at the factory and head office of PT. Adelphi TransAsia Indonesia Jl. Bumimas VIII No.2, Cikupamas Industrial Area, Tangerang Regency, Banten. The study schedulewill be conducted within months ranging from March to July 2017.

Design Analysis and Hypothesis Testing. The validity test shows the extent to which a measuring instrument measures the construct to be measured. The homogeneity test was performed to test the validity analysis. To measure the validity of the construct can be identified through its loading factor value. Requirements for data to be valid if significant loading factor. Since significant loading factors may still be low in value, the standardized loading estimate should be equal to 0.50 or more and ideally should be 0.70 [5]. Testing of the reliability of data can be done by analyzing the value of Variance Extracted (AVE) and Construct Reliability (CR). According to Ghozali (2014), the data criteria are called reliable if the AVE value is equal to or above 0.50 and the CR value is equal to or above 0.70.

3 Results And Discussion

Structural model analysis is done with three stages, namely: analysis of measurement model (Outer Model), structural model analysis (Inner Model), and Hypothesis Testing.
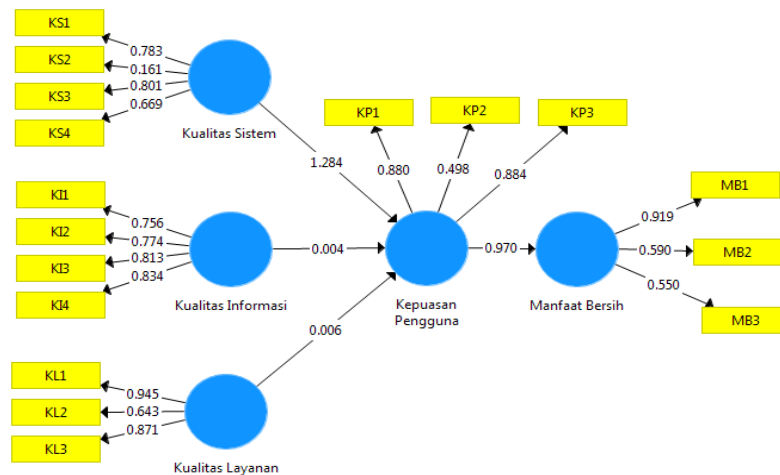
Fig. 2. Output Analisis Weighting Scheme.

The loading factor value of the weighting scheme should be greater than 0.7 of each indicator. Indicators having a loading factor <0.7 must be removed from the model and recalculated. Indicators that meet the requirements are KS1, KS3, KI1, KI2, KI3, KI4, KL1, KL3 KP1, KP3, and MB1. Here's a picture of structural model re-estimation.
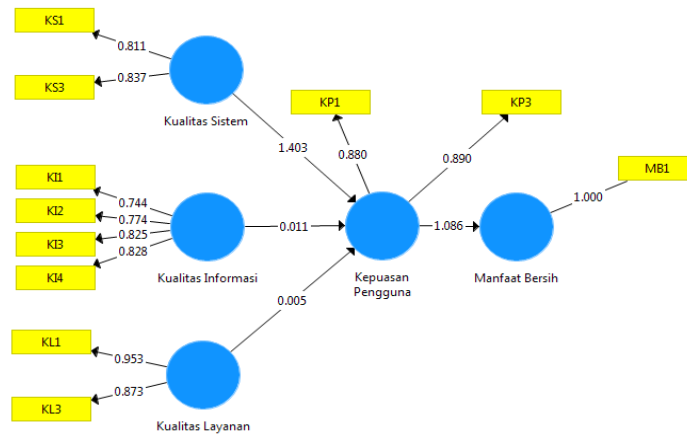
Fig. 3. Re-estimate Analisis Weighting Scheme

Once re-estimate, the results have met convergent validity because all loading factors> 0.7. Thus it can be said that the convergent validity of the System Quality construct, Information Quality, Service Quality, User Satisfaction, and Net Benefits are valid.

Discriminant validity evaluation can be done by comparing the square root of the Average Variance Extracted (AVE) value for each construct with the correlation value between the constructs in the model. A good AVE value must be greater than 0.5. In this study, the value of AVE can be seen in the following figure

	Average Variance Extracted (AVE)
Kepuasan Pengguna	0.783
Kualitas Informasi	0.630
Kualitas Layanan	0.835
Kualitas Sistem	0.679
Manfaat Bersih	1.000

Fig. 4. AVE Value.

Based on the AVE results in Fig. 4 AVE values all constructs> 0.5. it can thus be said that the convergent validity of the System Quality construct, Quality of Information, Service Quality, User Satisfaction, and Net Benefits is valid by AVE testing.

In addition to the validity test, reliability test is also performed to test the reliability of a construct. Reliability test is performed to prove the accuracy, consistency and accuracy of the instrument in measuring the construct. In PLS-SEM to measure the reliability of a construct with reflective indicators can be done in two ways that is with Cronbach's Alpha and Composite Reliability (CR). Rule of Thumb is usually used to assess the reliability of the construct that is the value of Composite Reliability must be greater than 0.7.

	Composite Reliability
Kepuasan Peng...	0.879
Kualitas Inform...	0.872
Kualitas Layanan	0.910
Kualitas Sistem	0.809
Manfaat Bersih	1.000

Fig. 5. Composite Reliability.

Based on the test results in Fig. 5 Composite Reliability values of all constructs> 0.7. Thus it can be said that the Composite Reliability of the construct of System Quality, Information Quality, Service Quality, User Satisfaction, and Net Benefit is reliable.

After passing validity test and reliability test, then got result that data used in this research have valid and reliable. The next step in this test is the significance between exogenous and endogenous constructs. Significance of model outer can be known after bootstrapping. The significance of endogenous constituent indicator can be seen from the statistical t value. If t value> t table, then all indicators can significantly measure endogenous constructs. The t table value for the degree of freedom => 200 (~) and α = 0.05 is 1.96.
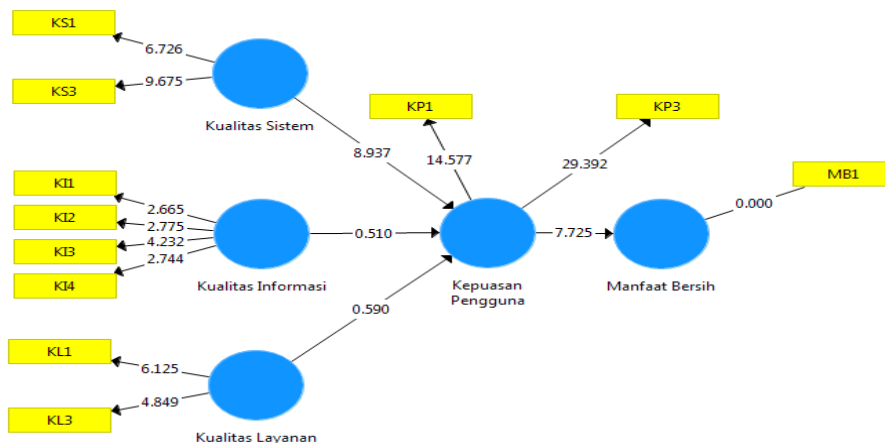

Fig. 6. Bootstrapping.

	Original Sample (O)	Sample Mean (M)	Standard Deviation ...	T Statistics ...	P Values
Kepuasan Pengguna -> Manfaat Bersih	0.722	0.724	0.093	7.725	0.000
Kualitas Informasi -> Kepuasan Pengguna	0.077	0.109	0.151	0.510	0.610
Kualitas Layanan -> Kepuasan Pengguna	-0.054	-0.055	0.092	0.590	0.556
Kualitas Sistem -> Kepuasan Pengguna	0.790	0.778	0.088	8.937	0.000

Fig. 7. Bootstrapping Value.

From figure 7 above the value of parameter coefficient and t-statistic value, it can be concluded the test result from each hypothesis is as follows:

Hypothesis 1 states that the factor of System Quality has a positive effect on User Satisfaction significantly. Hypothesis test results show the path between Quality System with User Satisfaction has a parameter coefficient of 0.790 which means that the Quality System positively affect the User Satisfaction, the higher the Quality System then the higher User Satisfaction. The value of t-statistics is 8,937. This shows that the Quality of System factor significantly affects User Satisfaction. That is, the first hypothesis is acceptable.

Hypothesis 2 states that the factors of Quality of Information positively affect the User Satisfaction. Hypothesis test results show the path between Quality of Information with User Satisfaction has a parameter coefficient of 0.077 which means that the Quality of Information positively affect the User Satisfaction, the higher the Quality System then the higher User Satisfaction. The t-statistical value is 0.510. This shows that the factor of Quality of Information affects User Satisfaction is not significant. That is, the second hypothesis is rejected.

Hypothesis 3 states that the factor of Service Quality has a positive effect on User Satisfaction. Result of hypothesis test show path between Quality of Service with User Satisfaction have parameter coefficient equal to -0,054 which mean that Service Quality negatively affect User Satisfaction. The t-statistics value is 0.590. This indicates that the Quality of Service factor affects User Satisfaction insignificantly. That is, the third hypothesis is rejected.

Hypothesis 4 states that the factor of User Satisfaction has a positive effect on Net Benefit. Result of hypothesis test show path between User Satisfaction with Net Benefit have parameter coefficient equal to 0,722 which mean that User Satisfaction have positive effect to Net Benefit, Higher User Satisfaction hence higher Net Benefit. The value of t-statistics is 7,725. This indicates that the User Satisfaction factor affects the Net Benefit significantly. That is, the fourth hypothesis is acceptable.

Structural Model (*Inner Model*)

The evaluation of the structural model (inner model) aims to predict the relationship between the latent variables whether they have a constructive match. The structural model (inner model) can be evaluated by looking at the percentage of variance explained by looking at the R-square value of endogenous latent construct. The higher the value of R2 means the better the prediction model of the proposed research model [5].

R Square

Matrix	R Square	R Square Adjusted	
		R Square	R Square Adjus...
Kepuasan Peng...		0.643	0.608
Manfaat Bersih		0.521	0.506

Fig. 8. Nilai R-Square.

In Fig. 8, the value in the User Satisfaction construct of 0.643 can be interpreted that, the user satisfaction construct variability which can be explained by System Quality, Information Quality, and Service Quality of 64.3%, while 35.7% is explained by other variables outside of the studied. Then the value on the net benefit construct of 0.521 which can be interpreted that, the variability of net benefit construct which can be explained by User Satisfaction of 52.1%, while 47.9% is explained by other variables outside of the studied.

Final Model of Research

From the results of data processing that has been done on the questionnaire distributed to employees of PT. Adelphi TransAsia Indonesia, obtained research model as follows:
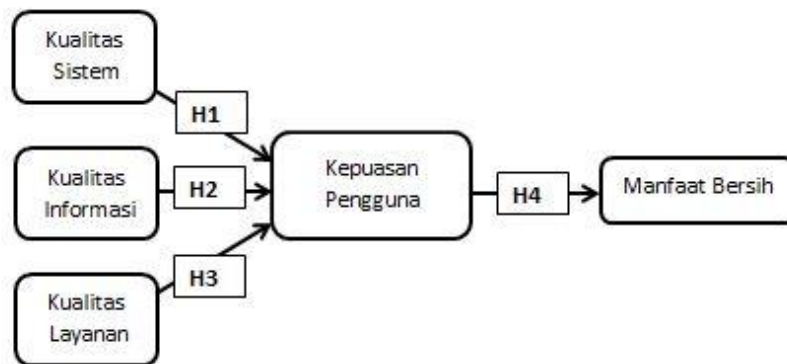

Fig. 9. Final Model of Research.

Based on the final model of research, it is known that Quality System directly affects User Satisfaction. Hypothesis test results show the path between System Quality and User Satisfaction has a value of P-Value of 0.000 and t-statistics of 8.937. This means that the first hypothesis is of significant positive or acceptable value. Quality of Information directly affects User Satisfaction. Hypothesis test results relationship between Quality of Information and User Satisfaction has a value of P-Value of 0.610 and t-statistics of 0,510. This means that the second hypothesis is not significant or rejected. While Quality of Service does not directly affect User Satisfaction. The result of hypothesis test of relationship between Service Quality and User Satisfaction has P-Value value of 0,556 and t-statistic equal to 0,590. This means that the third hypothesis is not significant or rejected As for the relationship between User Satisfaction and Net Benefits has a value of P-Value 0.000 and t-statistics of 7.725. This means that the fourth hypothesis is positive and significant or acceptable.

4   Conclusion

Based on the results of research, obtained some conclusions in the study as follows:

System Quality affects User Satisfaction positively and significantly. Means the higher Quality of SAP-Based ERP System Applications from PT. Adelphi TransAsia Indonesia, the higher its User Satisfaction.

Quality of Information affects User Satisfaction positively but not significantly. Means Information Quality of ERP System Based on SAP Application from PT. Adelphi TransAsia Indonesia has not significantly impact on User Satisfaction so it needs to be improved again and need other variables that can influence significantly.

Service Quality does not affect User Satisfaction positively and significantly. Means Quality of Service ERP System Based on SAP Application from PT. Adelphi TransAsia Indonesia has not significantly impact on User Satisfaction so it needs to be improved again and there needs to be other variables that can affect positively and significantly.

User Satisfaction, affecting Net Benefit positively and significantly The results of 52.1% valued research have been impacted significantly to the benefits gained by the company and can be considered successful, but still needs to be improved again.

Some suggestions to consider in relation to the results of this study are as follows:
1. Need to improve the Information Quality of ERP system based on SAP Application to have a significant effect on User Satisfaction.
2. Need to be evaluated Service Quality of ERP system based on SAP application and other supporting indicators in order to positively influence and increase User Satisfaction.
3. Need to do training periodically and depth to all employees of PT. Adelphi TransAsia Indonesia on the use of SAP-based ERP system for the function of the system is used properly and maximally to improve User Satisfaction.

References

[1] Admaja, A. F. 2014. Analisis Kesuksesan Sistem Informasi Manjemen Sumber Daya dan Perangkat Pos dan Informatika (SIMS). Buletin Pos dan Telekomunikasi, 12(2).
[2] DeLone, W. H., & McLean, E. R. 1992. Information Systems Success: The Quest for the Dependent Variable. Information Systems Research, 3(1), 60-95.
[3] DeLone, W. H., & McLean, E. R. 2003. The Delone and McLean Model of Information Systems Success: a Ten-Year Update. Journal of Management Information Systems, 19(4), 9-30.
[4] Fendini, D. S., Kertahadi, & Riyadi. 2013. Pengaruh Kualitas Sistem dan Kualitas Informasi Terhadap Kepuasan Pengguna (Survei pada Karyawan Pengguna Aplikasi Pelayanan Pelanggan Terpusat (Ap2t) Di PT. Pln (Persero) Area Malang). Jurnal Administrasi Bisnis, 4(1), 1-11.
[5] Ghozali, I. 2014. Structural Equation Modeling Metode Alternatif Dengan Partial Least Squares (PLS). Edisi 4. Semarang: Badan Penerbit Universitas Diponegoro.
[6] Indrajit, & Permono. 2005. Manajemen Manufaktur. Yogyakarta: Pustaka Fahima.
[7] Laudon, K. C., & Laudon, J. P. 2012. Management Information System: Managing the Digital Firm, Twelfth Edition. New Jersey: Prentice-Hall.
[8] Sanjaya, I., & Admaja, A. F. 2011. Pengukuran Kesuksesan Sistem Informasi Manajemen Frekuensi (SIMF) Dengan Model Delone dan McLean. Puslitbang Sumber Daya dan Perangkat Pos dan Informatika.