

The Influence Of Quality Information Toward User Satisfaction of Enterprise Resource Planning With Top Management Support As Moderating Variable

Heri Wijayanto¹

Universitas Muhammadiyah Ponorogo
Faculty of Economics
Ponorogo, Indonesia
Ok_coi@yahoo.com

Hakas Putri Wikan Estu³

Universitas Airlangga
Master of Economics Student
Surabaya, Indonesia
hakasputri@gmail.com

Tulus Haryono²

Universitas Sebelas Maret
Faculty of Economics
Surakarta, Indonesia
Tulus_fe_uns@yahoo.com

Abstract— This research aims to analyze the influence of ERP quality informations toward user satisfaction and to analyze the role of the top management support as a moderation variable toward the influence of information quality to the user satisfaction. The result of the previous researches about the influence of information quality to the user satisfaction shows the inconsistent result; some of them support and some of them do not support the theory of DeLone and McLean which state that the quality informations effect to the user satisfaction. The inconsistent result shows that there are other variables which take a role to strengthen or weaken the influence between the variables. The predicted variables that having role is the top management support because the top management support is a critical success factor of ERP implementation. The research object is the university in East Java, Indonesia, involving 164 universities with 492 respondents. Moreover, structural equation modelling (SEM) AMOS 22 program is used for analyzing tool. The research result shows that the quality information does not effect the user satisfaction with p value=0.133 and the moderation of the top management support influence the quality of information toward user satisfaction with p value=0.000. This research concludes that the variable of the top management support proves significantly having role in strengthening the influence of information quality toward the user satisfaction.

Keywords—ERP, quality information, top management support, user satisfaction, management

I. INTRODUCTION

Enterprise Resource Planning (ERP) is a kind of information which is able to integrate several activities in

business, include human resources, marketing, production, relationship between management and customer, and finance in single system through the using of shared database (Lin, Hsu & Ting, 2006). ERP has the ability in terms of balancing the supply and demand for the company overall through the ability to connect with the customers and suppliers in a single unified of availability, as a system to support the decision making and integrate every functional parts in the company (Wallace & Kremzar, 2001).

The success of the ERP implementation is determined by several factors including: quality system, information quality, service quality, use, user satisfaction, the net benefit (DeLone & McLean, 2003). The information quality is the extent which the information consistently able to fulfill the requirements and expectations of all those who need the information to perform the process of information quality in multidimensional and a wide variety of measuring characteristics, including: relevance, completeness, security, novelty, accuracy and timeliness. User satisfaction is a respond to the users of the output ERP, which measured by the level of satisfaction, a sense of proud to use, and the overall feeling of satisfaction.

The influence of information quality toward user satisfaction, some researchers state to support them, including: Al-Debei, Jalal dan Al-Lozi (2013) research in Jordania, Ajoye and Nwagwu (2014) research in Nigeria, and Makokha and Ochieng (2014) research in Kenya, while the research which done in Finland by Raija (2011) states that the information quality is not effect toward the user satisfaction.

The linkage in two variables in the model that inconsistently show the existence of the other variables which take a role indirectly is strengthen or weaken the influence of the independent variable toward dependent variable. Based on the difference of the research result in developed countries and developing countries, as a result the difference of characteristic from developed countries and developing countries is possible as a moderator variable.

The differences of characteristic from developed countries and developing countries are: culture, economics, history, politics, international relations, market orientation, development, efficiency, productivity, and management support. The differences in the management of ERP system is situated in the infrastructure and the transfer of science and technology. The infrastructure of information quality as the shared use of information technology resources which consist of physical technical from hardware, software, communication technology, data and core application and human component that are the specific ability, commitment, values, norms and knowledge that combined to create information technology for organization uniquely (Bryd& Turner, 2000).

Esteves, Pastor, and Casanovas (2000) state that the top management support is a success factor of ERP implementation. Bradford and Florin (2003) also state that the performance and the satisfaction of any element in the company are affected by the implementation of the top management support. So it can be concluded that top management support must be considered in the company to control the implementation of ERP in order to run it properly.

The level of product quality (system and information quality) in the level of user behavior (use and user satisfaction) may be different in developed and developing countries. Differences in the role of top management, the characteristics of the state in the implementation of ERP, and top management support are those that indirectly lead to differences in quality. The behavior and quality of the product is inseparable because it will affect each other. Failure in any of the elements will cause failure across the ERP implementation. Technology transfer to determine success can also be supported by management's involvement to improve product quality to the level of user behavior.

II. RESEARCH METHOD

A. Population

This research is conducted in the universities in East Java. This decision is determined by considering that East Java is a large province in the eastern part of Java Island that consists of 29 regencies and 9 cities (BPS JawaTimur/ East Java Central Bureau of Statistic, 2010). Moreover, according to PDPT (Pangkalan Data PerguruanTinggi/ College Database) in 2015, there are 474 colleges and universities in East Java province. This number is the highest amount of universities in a province among all provinces in Indonesia (forlap.dikti.go.id, 2015)

B. Sample

The sample chosen for this research are 57 Webometric rated universities and 107 unrated universities. Three respondents are chosen as the representatives of each college, so that they can represent the quality system of ERP for the colleges.

C. Sampling Technique

The sampling technique used in this research is disproportionate stratified random sampling. This technique is used because the management of information system in universities can be stratified into two: Webometrics rated universities and unrated universities. Based on Webometrics rating system, there are 57 rated universities and 228 unrated universities in East Java province under the coordination of Minister of Research, Technology and Higher Education. In other words, those universities are all stratified but the number is not disproportionate.

D. Technique of Analyzing Data

In analyzing the data, the researcher used the Structural Equation System (SEM) equipped by Amos 22 software. This instrument was chosen by considering its compatibility with the data had been collected and the objectives of the study. Specifically, SEM with the correlation of moderation was used to know the influence of moderation based on the method of Ping (1995). This method stated that single indicator should be used as an indicator of a moderation variable. This single indicator is formulated from the multiplication of indicator of exogenous latent variable and its indicator of moderation variable.

III. RESULT AND DISCUSSION

A. Evaluation of Model Appropriateness

The evaluation of model appropriateness is conducted using two types of techniques of analysis. They are Confirmatory Factor Analysis (CFA, hereafter) and Regression Wight.

a. CFA of Information Quality

CFA construct of Information Quality (IQ) is the step of measurement for the dimensions forming the latent variable in the construct. IQ is measured by using five indicators that are symbolized as IQ1, OQ2, IQ3, IQ4, and IQ5. The appropriateness of construction model of Information Quality as displayed in figure 1 informed that the measurement model for Information Quality construct specified for this study is generally consistent and fit the data. It is revealed that the chi-square value =26.512 is higher than the chi-square table = 11.07, in which the $\alpha = 0.05$ and the $df = 5$. It indicates that the sample covariance matrix is significantly different with the covariance matrix estimated in the model. Meanwhile, the RMSEA value = 0.162 shows that this result does not suit the goodness of fit as the suggested value (Hair et al, 2010), that is <0.08 in difference. Furthermore, the discrepancy between covariance matrix of the sample and the matrix of covariance estimated on the model per degree of freedom (df) is different. The evaluation of the influence among constructs with their

indicators (loading factor) and the criteria of Overall Measurement Fit Model of each dimension can be explained if there is a significant measurement result (<0.05). This result indicates that the IQ dimension is adequate to be extracted to form a variable. The analysis result of the influence among constructs (regression weight) in forming a variable is displayed in Table I.

Table 1. Regression weight constructs of the information quality

			<i>Estimate</i>	<i>S.E.</i>	<i>C.R.</i>	<i>P</i>
IQ4	<---	IQ	1.000			
IQ3	<---	IQ	4.281	1.792	2.388	0.017
IQ2	<---	IQ	1.885	0.769	2.450	0.014
IQ1	<---	IQ	0.921	0.397	2.318	0.020
IQ5	<---	IQ	4.873	1.702	2.863	0.004

The analysis result of the influence among constructs in Table I shows that the analysis results of an indicator or dimension forming each variable is good, in which it has value with CR that is higher than 1.96 and probability that is smaller than 0.05. From thus result, it can be said that the indicator forming the variable has shown a uni-dimensionality, and the model can be used for further analysis without any modification or adjustment. The CFA result in the construct of information quality showed that the five indicators; being on time, actual, periodic, relevant, and complete contributes in forming the construct of information quality. The significance value at tolerance rate 0.05 measured using the regression weight construct of information quality displayed in Table I showed that the result of P value is lower than 0.05 for all questions forming the construct. This result indicates that all items and questions have close relationship and they are significant in forming the construct of information quality.

b. CFA of User Satisfaction

CFA construct of user satisfaction (US) is the step of measurement for the dimensions forming the latent variable in the construct. US variable is measured using four indicators. Those indicators are specified into five questions that are symbolized as US1.1, US1.2, US1.3, US1.4, and US1.5. Estimation of measurement model for construct of the user satisfaction as displayed in Figure 4.6 revealed that the measurement model for construct of user satisfaction specified in this study is generally consistent and fit the data, in which the chis-square value= 14.574 is close to the chi-square table= 11.07 with $\alpha = 0,05$ and $df = 5$. It indicates that the covariance matrix of the sample is significantly similar to the covariance matrix estimated in the model. Meanwhile, the RMSEA value= 0.108 shows that this result suits the goodness of fit as the suggested value (Hair et al, 2010), that is <0.08 in difference. Furthermore, the discrepancy between matrix of covariance sample and the matrix of covariance estimated on the model per degree of freedom (df) is only slightly different. The evaluation of the influence among constructs with their indicators (loading factor) and the criteria of Overall Measurement Fit Model of each dimension can be explained if there is a significant measurement result (<0.05). This result indicates that the user satisfaction dimension is adequate to be extracted to form a variable. The analysis result of the

influence among constructs (regression weight) in forming a variable is displayed in Table II. The analysis result of the influence among constructs in Table II shows that the analysis results of an indicator or dimension forming each variable is good, in which it has value with CR that is higher than 1.96 and probability that is smaller than 0.05.

Table 2. regression weight constructs of the user satisfaction

			<i>Estimate</i>	<i>S.E.</i>	<i>C.R.</i>	<i>P</i>
US1.4	<---	US	1.000			
US1.3	<---	US	1.275	.264	4.835	***
US1.2	<---	US	.902	.215	4.201	***
US1.1	<---	US	1.095	.247	4.429	***
US1.5	<---	US	.821	.184	4.473	***

From thus result, it can be said that the indicator forming the variable has shown a undimensionality, and the model can be used for further analysis without any modification or adjustment. The CFA result in the construct of user satisfaction showed that there are four questions; being satisfied with the personal work, team work, overall work, telling the work to other people, and feeling proud in using ERP system contributes in forming the construct of user satisfactory. The significance value at tolerance rate 0.05 measured using the regression weight construct of information quality displayed in Table I showed that the result of P value is 0.000 for all questions forming the construct. This result indicates that all items and questions have close relationship and they are significant in forming the construct of user satisfactory. At the level of significance 0.05 which is measured using regression weight of the construct of top management support as illustrated in Table III shows that P value is 0.000 in all questions which form construct. This indicates that all statements have a strong connection and they are all significant in forming the construct of top management support. The Result of Hypothesis Testing of information quality affects user satisfaction (H1) The estimation of parameters for H1 testing is seen from the value of CR and p value. As a result, 1.505 or under $\pm 1,96$ is resulted from CR testing meaning that information quality does not have a positive effect towards user satisfaction, while 0.133 or upper 0.05 resulted from p value testing meaning that information quality does not affect user satisfaction significantly. Information quality does not affect positively and not significant in the implementation of ERP in East Java universities. The result does not support the theories from Urbach, Smolnik dan Riemp (2010), Makokha and Ochieng (2014), Choga and Nyaruwata (2014), Machanda and Mukherjee (2014), and Ajoye and Nwagwu (2014) who state that information quality affects user satisfaction. The difference in the result of the research possibly caused by some factors: 1) less accuracy of information, unclear objectives, which could have impact on late decision making, overlap between importance and responsibility, and tendency of having different perceptions, 2) there is something wrong with the source of information (data) that may change the real data; this related to information quality which not fully support data communication yet, 3) late decision making often

happens in universities, so that it contributes to the decrease of trust level towards given information.

Table 3. the result of model conformity texting of information quality, top management support, and moderation

Goodness of Fit Index	Cut-off value	Result	Evaluation Model
Degree of freedom (df)		60	
Chi-iquare	< chi-square table at df = 60 (79.08)	123.509	Marginal
Cmin/df	≤ 2.00	2.058	Marginal
AGFI	≥ 0.90	0.849	Marginal
GFI	≥ 0.90	0.900	Good
TLI	≥ 0.95	0.934	Marginal
CFI	≥ 0.95	0.950	Good
RMSEA	≤ 0.08	0.081	Good

Respondent appraisal towards ERP management in East Java universities reveals that there is a weakness in the availability of students' academic data. Data which relates to the students' academic is a priority in ERP since the crucial initial aspect in running a university is students, and the most dominant data is students' data which comprise grading system, payment system, financial system, programming system, supervising system, etc.

B. The Result of Hypothesis Testing of top management support moderates effect of information quality on user satisfaction (H2)

Analysis of exogenous variable (information quality), endogen variable (user satisfaction) and moderation variable (top management support) done by following the steps: Step I conducted estimation without including interaction variable to get the value of loading factor and error variance from exogenous latent variable, information quality. The Model is illustrated in Figure 1. Loading factor interaction latent variable is interaction between information quality and top management support which use to get error variance value. Step II conducted model estimation by including interaction variable and loading factor value for interaction variable constrained by the value 6.97291, and error variance value from interaction variable constrained by the value 6.153105.

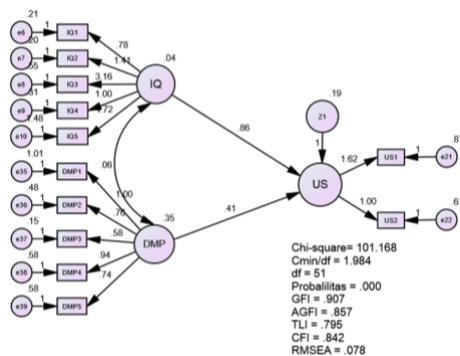


Fig. 1. Model without information quality moderation, top management support, and user satisfaction.)

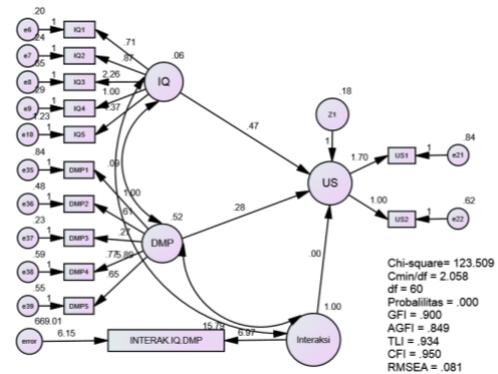


Fig. 2. Model with interaction moderation variable from multiplication of information quality and top management support

The model after interaction variable includes as Figure 2 shows. Model estimation of construct measurement of information quality, user satisfaction, and top management support as illustrated in Figure 4 informs that specified model in this data was generally inconsistent and does not fit with the data yet since the value of Chi-square = 123.509 is bigger than the value of Chi-square table at $\alpha = 0,05$ and $df = 60$, 79.08. The value of RMSEA = 0.078 shows that the value approached goodness of fit as suggested by (Hair et al. 2010), that is, < 0.08, and discrepancy between sample covariance matrix and covariance matrix estimated in degree of freedom is small. Summary of model conformity testing is elaborated in Table III. In summary, the result of model conformity test in Table III reveals that the construct which is used to form a model met the criteria of goodness of fit that has been previously stated. The significance of value of some parameters including effect of information quality on user satisfaction, effect of top management support on user satisfaction, and interaction variable between information quality and top management support can be seen in Table IV. The result of effect among constructs testing in Table 6 shows that information quality had no effect on user satisfaction which was marked with two resulted values namely (1) the value of CR (1.505) which was under the required value, > 1.96, and (2) the value of probability (0.133) which was upper the minimum level of significance, 0,05. Interaction variable between information quality and top management support has effect on user satisfaction with the probability value 0.000, and thus it can be concluded that top management support variable is the moderation variable which effect toward information quality on user satisfaction.

Table 4. regression weight of information quality variable, top management support, and moderation

			Estimate	S.E.	C.R.	P
US	<---	IQ	0.468	.312	1.505	.133
US	<---	DMP	0.276	.118	2.343	.019
US	<---	Inter-action	0.003	.001	3.898	***

Reaching top management support through knowledge about ERP by the management will strengthen effect of information quality on user satisfaction. Such the knowledge have by the management will ease users to share problems

they encounter on the field, so that it will give users empathy that can make them interact more frequently with ERP.

IV. CONCLUSION

Top management support in the implementation of ERP in East Java universities is generally good. The form of management support which has the highest mean is the availability of budget, 3.77, indicating that the availability of budget provided by the management is a must, and has the strongest effect among other indicators of top management support. The result of analysis proves that top management support strengthened effect of system quality on use and user satisfaction, and effect of information quality on use and user satisfaction in the implementation of ERP in East Java universities. Therefore, it can be concluded that inconsistency of some prior studies about effect of system quality on use and user satisfaction is influenced by other variables, and one of them was top management support. The suggestions from this research is that top management support in universities must have knowledge about quality of information which is good to implement ERP to increase performance and help universities to get maximum benefits from the implementation of ERP. It is needed to consider organization culture factor as moderation variable for conducting future research.

REFERENCES

- [1] Al-Debei, Jalal dan Al-Lozi (2013), "Measuring web portal success: a respecification and validation of the deLone and McLean information system success model", *Int. J. Business Informations system*, Vol. 14, no. 1, pp. 96-133
- [2] ChogaFarai and NyaruwataLeonorah Tendai, 2013, "The role of information quality as a determinant of production system usage, user satisfaction and companies benefits: The application of DeLone and McLean (D&M) information systems (IS) success model in the Zimbabwean manufacturing sector (1997 – 2013)", *International journal of Innovative Research in Management*, vol. 3, No. 8,
- [3] BAN-Perguruan Tinggi, 2011, *Kumpulan instrument standart 11 sistem informasi Perguruan Tinggi*, Departemen pendidikan Nasional.
- [4] Boynton, Wiliam C., Johnson, Raymond N & Walter G. Kell., 2001, *Modern Auditing 7th Edition*, John Wiley & Sons, Inc, New York
- [5] Bradford, M., and Florin, J., 2003, "Examining the Role of Innovation Diffusion Factors on the Implementation Success of Enterprise Resources Planning Systems", *International Journal of accounting information system*, vol. 4, no. 3, pp. 205-225, doi: 10.1016/S1467-0895(03)00026-5
- [6] Byrd, T. A., & Turner, D. E. (2000), "Measuring the flexibility of information technology infrastructure: Exploratory analysis of a construct", *Journal of Management Information Systems*, vol. 17, no. 1, pp. 167-208.
- [7] Coombs, C. R., Doherty, N. F. & Loan-Clarke, J., 2001, "The importance of user ownership and positive user attitudes in the successful adoption of community information systems", *Journal of End User Computing*, vol. 13, no. 4, pp. 5–16.
- [8] DeLone, McLean, 2003, "The DeLone and McLean model of information system success: a ten-year updated", *Journal of management information system*, vol. 19, no. 4, pp. 9-30.
- [9] Esterves, Pastor, Casanovas, 2000, *Towards the unification of critical success factors for ERP-implementations*, 10th Annual Business Information Technology Conference (BIT), Manchester.
- [10] Hair, Joseph F., Rolph E. Anderson, Ronald L. Tatham, William C.Black, 2010, *Multivariate Data Analysis with Readings 7th Edition*, Prentice Hall, Englewood, New Jersey.
- [11] Holland, C. P., and Light, B., 1999, "A Critical Success Factors Model For ERP Implementation", *IEEE Software*, vol. 16, no. 3, pp. 30-36.
- [12] Holland, C.P., Light B., Gibson, N., 2010, "A critical success factor model for enterprise resource planning implementation", *European conference on information system*, pp. 273-279.
- [13] Hashmi, K., 2004, *Introduction and Implementation of Total Quality Management (TQM)*, www.isisigma.com. September 2005
- [14] Kim, Sung and Chung, Y.S., 2003, "Critical Success Factors for IS Outsourcing Implementation From An Interorganizational Relationship Perspective", *Journal of computer Information Systems Summer*, vol. 12, no. 2, pp 81-90.
- [15] Lin Hua-Yang, Hsu Ping-Yu, Ting Ping-Ho, 2006, "ERP Systems Success: An Integration of IS Success Model and Balanced Scorecard", *Journal of Research and Practice in Information Technology*, Vol. 38, No. 3, pp. 215-228.
- [16] Makokhal & Daniel O. Ochieng, 2014, "Assessing the Success of ICT's from a User Perspective: Case Study of Coffee Research Foundation, Kenya", *Journal of Management and Strategy*, Vol. 5, No. 4, pp. 46-53, doi:10.5430/jms.v5n4p46 URL: <http://dx.doi.org/10.5430/jms.v5n4p46>
- [17] Raija Halonen, 2011, "Reflecting With The Delone & Mclean Model", Accepted to the International Workshop on Practice Research in Helsinki, June 8, 2011, pp.1-13