The Impacts of Implementing TQM, Personal Competence Management, and ERP in Improving Business Performance

Hotlan Siagian1, Zeplin Jiwa Husada Tarigan2, Widjojo Suprapto3
Petra Christian University, Surabaya , East Java, Indonesia
Hotlan.siagian@peter.petra.ac.id; zeplin@peter.petra.ac.id; joe.suprapto@peter.petra.ac.id

Abstract

Manufacturing companies always apply a system through the project and normally project managers are assigned based on their capability to handle such a project. Companies implementing Total Quality Management (TQM) requires a QA manager having a reliable competency especially in personnel management. When the application of TQM is already running well, the company can also implement ERP (Enterprise resources Planning) and requires a project manager as welll to apply the system. The completion of a project depends heavily on the ability of the project manager in selecting the projects to be undertaken, choosing a strategy in completing the project, choosing the method of work to complete the project, choosing the measurement system to monitor the project as well as evaluating the project, and declaring the end of the project. This study will explore the impact of implementing TQM on personal management, which consists of knowledge, skill, personal competence, and demonstrable performance, to the ERP implementation in order to improve business performance. Based on the results of 71 questionnaires distributed in East Java and using PLS (Partial Least Square) to analize, it is obtained that TQM has positive influences on the knowledge, skill, and demonstrable performance but does not influence on the personal competence. Personal management which influences the ERP implementation is the skill, personal competence, and demonstrable performance, while knowledge has no influence. Finally, the ERP implementation affects the business performance. This research is supported by the grant from the government of Indonesia through the ministry of research, technology and higher education

Keywords: TQM implementation, personal management, ERP implementation, and business performance

1. Introduction

Implementation of Total Quality Management (TQM) is one of modern management concept which try to respond appropriately to any such change, whether driven by external forces or internal organization. Application of TQM in the company will give a good impact on the customer satisfaction and the company achievement. The customer will receive the products having good quality in accordance with their expectations with the same cost, while the benefits for the company is a reduction production cost due to elimination of product defect occurrence. The concept of quality is defined as customer perception to which extend the product or service has met the expectations of the customer. Therefore, all the elements of organization existing within a company should have a role in achieving quality in the pursue of meeting customer expectations. Any restaurant commonly has a specific product quality being recognized very well by the community. However the restaurant does not always involve security personnel even though the security issue is one of the service expected by the customer. This means that security service is part of the total quality which can affect the quality perception of the customer. If the customer does not receive a proper security services then the customer can move to other restaurants. Implementation of TQM in the company in Indonesia are generally categorized by companies that have obtained ISO certification.

Research conducted by Castka, et al. [1] stated that the ISO 9000 as an international standard talking about how an organization can produce output (product or service) quality, which is given to the customer / user with consistent quality and always do continuous improvement. ISO 9001: 2008 recognizes that an integrated quality process involves all parts and functions of the organization. Everyone has a role in ensuring the quality and realizing the important role of customer satisfaction [2]. ISO 9000 standard is a quality management standard that has been accepted by more than 150 countries in the world with 410,000 companies in 1999 [3] (Houten, 2000) while the survey conducted (ISO / survey, 2004) states that in 2004 670,000 companies have adopted and received ISO. Another advantage of ISO 9000 is that it is generic so that it can be applied to any type of business or organization and can be integrated with other management systems [2].

There are five major reasons why companies adopt the ISO 9000 which are internal improvement, marketing positioning, control of suppliers, customer needs and requirements of existing regulations. While the research conducted by Huarng et al. [4] reveals that companies that have successfully adopted the ISO will increase the level of quality, better business competitiveness internationally, decrease costs, increase sales, resource development companies, and orientation on the customer. ISO 9000 can also promote cooperation between companies [5]. ISO implementation in companies assisted by the knowledge of the consultant will have an impact on business practices that is best for the organization. Many companies implement ISO to support the process of continuous improvement for the company. When companies make the process of ISO implementation in enterprise it is realize as a project work that must be done by the management and employees of the company. Jacobs et al. [6] declared the project is an interconnected set of activities where there is a starting point and end point. As a projects work, it is normally handled by a team which is usually a cross-functional organization that requires a variety of skills and knowledge and competence required by the project implementation.

Project management is a combination of personnel, policies, procedures and systems (manual or computer based), which enables the implementation of activities which constitute of planning, organizing, directing, and controlling cost, schedule, quality, and performance of the project. "The project management consists of the organization and the management of subsystem relationships, as well as the management of technical aspects (nonhuman). The management comprises technical aspects of the planning system elements, controlling system, the system methodology and information management systems [7]. The completion of a project depends heavily on the ability of project managers in selecting projects to be undertaken, choose a strategy in completing the project, choose the method of work to complete the project, choose the measurement system to monitor the project as well as how to evaluate a project, and how a project declared ended [8].

Research conducted by Crawford [9] focus on the nature and personal competence in charge and the competencies of the project manager. In exploring the relationship between project management training and the perception of achievement in the workplace, the first thing to do is to define the terms of competence and its derivatives and then look at the concept of competency into parts that can be measured against the standards as a basis for analysis. Competence was once a simple term with the definition in the dictionary as strength, ability, or capacity (to do a task) and qualifications or capacity, adequacy in performing a task.

According to Heywood et al. [10], competence can be derived from the attributes surrounding the project competence. Competence divided into the input competence in the form of knowledge, skills of the project team and personal competence and output competence which is demonstrable performance outputs. Competences of the project team will support the successful implementation of enterprise resources planning (ERP) to enhance corporate performance. ERP technology is an integrated information system and innovative in enhancing the company's performance because many companies build competitiveness by using information technology [11]. Based on the survey results from studying the estimation of some companies in China obtained an increase of 10-15% the performance of companies using ERP technology. Enterprise Resource Planning (ERP) is a way to manage the company's resources by using information technology to reduce cycle time, accelerate business transactions, improve the accuracy of financial statements (as the basis for e-commerce), and the presence of system network between organizations in the multinational enterprise [12].

Research conducted by Soja [13]states that the composition of the project team consisting of people who have the qualifications and knowledge of ERP as well as the active involvement of project team members give positive effects on the acceleration of the ERP implementation process. Research conducted by Tsai et al. [14] states that the vendor consultant and team project company jointly working on projects ERP will provide a good implementation because consultant ERP vendors have proper competence in performing customization of ERP products, while the project team Companies has competence in their area of function respectively.

2. Theoritical background

Project management is a temporary activity that took place within a limited period, with a specific allocation of resources to carry out tasks that have clear targets. A job that is declared as the project has the following characteristics: has a special purpose; there is a draft of the number / budget, the target schedule, quality criteria, and a clear purpose; temporary, in the old sense of work is limited by the work; and does not happen over and over. In general, the project can be divided as follows: first, engineering-construction projects with major operations feasibility study, design, procurement and construction such as the construction of buildings, bridges and others. Second, the manufacturing-engineering project was the production of a new product for the

company. Third, research & development projects such as generating prodk-product prototype. Fourth, project management services for example, ERP (Enterprise Resource Planning), Lean Manufacture, ISO-9001: 2000, the safety and health environment. Fifth capital project, the use of funds for investment eg land acquisition, land preparation, purchase of materials and others.

Project management information system is used as an infrastructure to support planning activities, analyzing the cost, schedule and scope of the project, preparing draft contracts, tender documents and make a proper report. When identifying the scope of the project has been carried out and definitively determined, then the next step is to compile and review the work packages and required resources. In regards to work scheduling, related computer software is used to make it in the form of bar charts and critical path method (CPM), all activities interdependency, float and critical path. Furthermore, project management information systems is used to analyze the impact of the interaction between the various elements of such a schedule with the cost method to the cost of the exchange of schedules (cost & schedule trade-off), the effectiveness of the use of resources by resource leveling method, due to limited resources or time availability. ERP implementation in a manufacturing company is a big project due to high cost, labor intensive because it involve almost all functions in the company and limited time.

Many companies in East Java have obtained ISO certification, which mean that company employees already have required knowledge and skill since this is one of the requirement by ISO 9000: 2008 certification stating that management companies ensure personnel performing work affecting product quality enabled on the basis of education, training , skills and appropriate work experience. Based on this reasoning, a company being certified by ISO 9000, should already have related capability of implementing ERP successfully. From the point of view of ERP, knowledge measurement is the extent to which an employee could understand the ERP project, disseminate ERP project and evaluate ERP project on an ongoing basis. Meanwhile the skills is measured by the ability to re-engineering business process, customize the ERP, identify ERP process and read the report [15].

Personal competence is an essential requirement during the ERP implementation by the enterprise. Management and completion of the project will be effective if supported by the manpower having good work behavior. Characteristics of personal competence that manage the implement the project should have four items indicators, namely: enthusiastic leader in completing the project, ability to overcome any problems arising during the project, ability to communicate well, and being optimistic that the project fits the purpose [15, 16]. Demonstrable performance which is the practical ability on the corporate management is measured using four item indicator namely: the ability to concentrate on the project, solve the problem in the wise manner, willingness to take risks, and being honest with the project team.

Many researchers have conducted research on the successful implementation of ERP. Sun et al. [17] states that successful implementation of ERP is determined by the time and cost required during its implementation, schedule and goals set when the ERP implementation must be clear, so that it makes it easy for the team in the implementation and also the need of top management commitment. Research by Yusuf et al. [18] found that ERP implementation is determined by the commitment of top management, implementation time, cost of implementation, the company's organizational culture, technical factors related to the ERP implementation, ERP consulting expertise and infrastructure owned by the company. Research by Wu and Wang [19] state that ERP implementation success factors are the capabilities and key user satisfaction, the ability the consultant or vendor of ERP, software and hardware capabilities and the need for training for ERP the key user and end user. This study uses four indicators to measure their ERP implementation ERP i.e.; the availability of framework of completing the project, particular plans of ERP project work, monitoring and Controlling the project completion time, ERP project was completed according to plan [13,17,].

The last variable, business performance, which in this case represented by the performance of the organization in implementing the projects is measured with on time project completion, quality of projects and the costs incurred in implementing the project. All these indicators are used to measure the effectiveness of work and efficiency of costs and resources in achieving the goals set. In measuring organizational performance by a company, two item indicators are used i.e, improved effectiveness of the company's processes and increased efficiency of the process of the company [20]. Based on above discussion, proposed research model for this study is described on Figure 1.

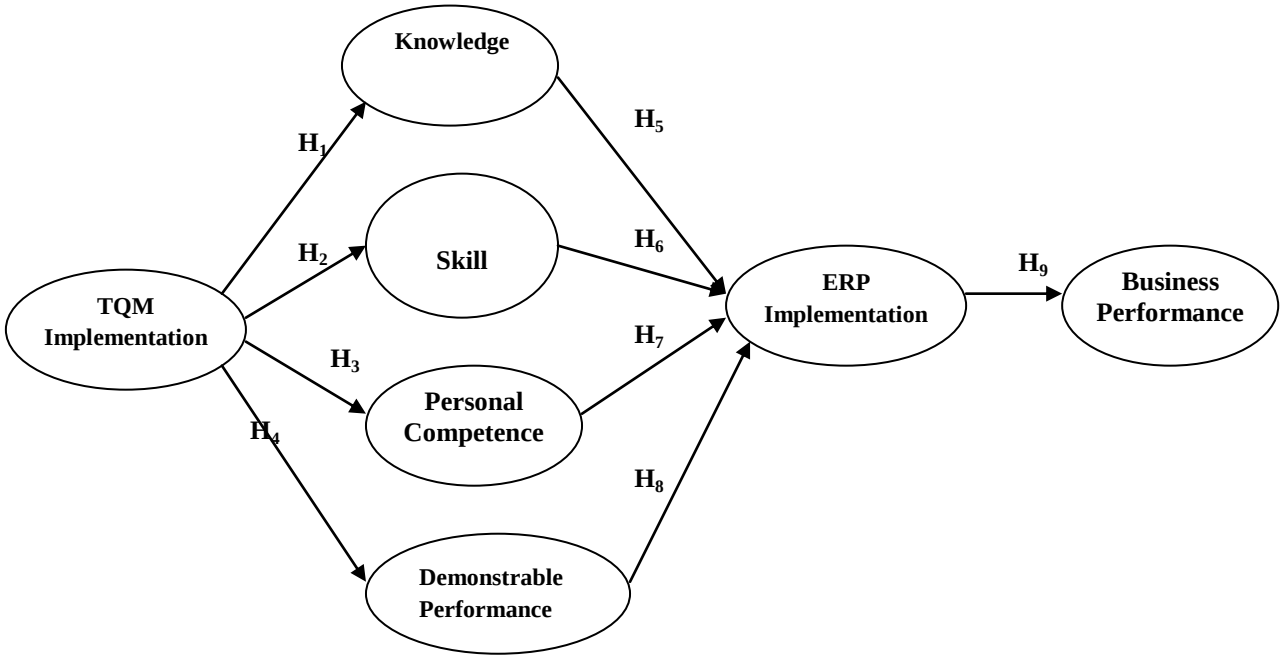

Figure 1. Research Model

Based on above research model, research hypothesis are proposed as follow:

H_1 :TQM implementation has impact on the knowledge of the project team in implementing ERP and enhancing business performance.

H_2 : TQM implementation has impact on the skill of the project team in implementing ERP and enhancing business performance

H_3 : TQM implementation has impact on the personal competence of the project team in implementing ERP and enhancing business performance

H_4 :TQM implementation has impact on the knowledge of the project team in implementing ERP and enhancing business performance.

H_5 : Knowledge of the project team has impact on the successful implementation of ERP and in the pursue of enhancing business performance.

H_6 : Skill of the project team has impact on the successful implementation of the ERP and in enhancing business performance.

H_7 : Personal competence of the project team has impact on the successful implementation of ERP and in enhancing business performance.

H_8: Demonstrable performance of the project team has impact on the successful implementation of ERP and enhancing business performance.

H_9: Implementation of ERP influence the improvement of business performance.

3. Research Methodology

Data was collected through distribution of questionnaires to the companies registered in the Ministry of Industry and Trade of East Java and which have been working on projects particularly service management. Selection of the company is based on the criteria that companies have been implementing ISO management system and also ERP system. This criteria is intended to make sure that the company has the experiences in implementing ISO syatem and ERP. To test the hypothesis and generate an appropriate model (fit), Structural Equation Modeling (SEM) with Smart PLS software was used. Reasons for using this model is the need of analysing the relationships between latent variables and its indicator or manifest variable and relationship between latent variable. Path diagram showing the flow of a causal relationship between exogenous and

endogenous variable. The causal relationships that resulted from this analysis will justify wether the theory confirmed or not. Based on the theoretical concept described previously, the proposed path diagram is shown in Figure 1. Model goodness of fitness for the inner models is measured using the R-square of dependent latent variables with the same interpretation by regression while Q-Square predictive relevance of the model, measures how well the observed values generated by the model and parameter estimation. Q-square value > 0 indicates the model has predictive relevance; otherwise if the value of the Q-Square < 0 shows a model lacks of predictive relevance [21]. Q-Square is calculated by the formula:

$$Q^2 = 1 - (1 - R1^2) (1 - R2^2) ... (1- Rp^2) \quad \text{Equation 1.}$$

where $R1^2$, $R2^2$ ... Rp^2 are R-square of endogen variable.

By assuming that data collected is distribution free, then structural model fitness will be examined using R-squre for dependent variable and Q-square for predictive relevance of the model.

4. Result of research

Questionnaires distributed directly to the company through personnel manager and researchers regularly monitored every two days to update the progress of completing the questionnaire. All completed questionnaires then were pick up by researcher. On the questionaires, respondent is requested to fill in the personal data such as their department, job title, length of work, education, type of projects and type of manufacturing.

Tabel.1. Respondent profile based on department

Departement	**Frequency**	**Percentage**
Marketing	23	32%
Financial/Accounting	14	20%
HRD	3	4%
R & D	1	1%
Production	14	20%
General	9	13%
Purchasing	3	4%
PPIC	2	3%
IT	1	1%
Quality Management	1	1%
Total	**71**	**100%**

Table 1 above shows the distribution of respondent against their department where they work. It can be seen that respondents are distributed on the marketing department 23 respondent (32%), production department 14 respondent (20%), financial/accounting department 14 respondent (20%), general affair 9 respondent (13 %) and others 11 respondent (15%). It means that almost all department of the company are invloved in the implementation of TQM and ERP.

Profile of respondents are also explored based on their positions in the organization of the company as shown in Table 2. The composition of respondent is composed of company owner 4 respondent (6%), director / vice president 9 respondents (13%), general manager / Plant Manager 2 respondents (3%), office manager 32 respondents (45 %), assistant manager 4 respondents (6%), office supervisor 9 respondents (13%), senior staff 11 respondents (15%). Respondents with position up to middle management accounts for 51 respondents (72%) meaning that majority of respondent are those who are responsible for the successful completion of the project in the company

Table 2. Respondent profile based on the position

Jabatan	Jumlah	Persentase
Owner	4	6%
Director	9	13%
General Manager	2	3%
Manager	32	45%
Asistant Manager	4	6%
Supervisor	9	13%
Senior Staff	11	15%
Total	**71**	**100%**

Tabel 3. Respondent profile based on work experience

Lama Kerja	frequency	Percentage
1- <3 years	26	37%
3- <5 years	16	23%
5- <10 years	15	21%
>10 years	14	20%
Total	**71**	**100%**

Profile of respondents as shown in Table 3 below is grouped based on work experience since joining the company. Number of respondents with experience between 1 and 3 years is 26 respondents (37%), between 3 and 5 years, 16 respondents (23%), between 5 and 10 years 15 respondent (21%), more than 10 years 14 respondents (20%). Respondent with work experience less than one year is considered not appropriate to be a respondent representative. Respondent with work experience more than 3 years account for 45 respondents or 61.2%. This composition of respondent indicates that the project management team in the company has proper experience in respect of collaboration, knowledge and understanding of the process. To some extent, it can be interpreted that the implementation of the projects within a company has involved professional and capable human resources.

Tabel 4. Respondent profile based on education

Pendidikan	frequency	Percentage
High school	7	10%
D1-D3	10	14%
S1	50	70%
S2	3	4%
S3	1	1%
Total	**71**	**100%**

As shown in Table 4 above, respondents is grouped based on their level of education with the composition of 7 respondent (10%) from high school, 10 respondent (14%) from diplome level, 50 respondents (70%) with bachelor level, 3 respondents (4%) with master level and 1 respondent (1%) with doctoral education. This composition of education level indicates that the persons in charge in implementing the project within the company are majority well educated which also mean that they have proper capability in terms of the implementation process, knowledge of collaboration and understanding on the project management.

Data collected from respondents are then analized using PLS software. First step is to analize if the outer model is valid or not by comparing to the acceptable limit. The validity of the outer model can be examined by assessing the convergent validity, discriminat validity and composite reliability as summarized on the Table 5

below. It is shown on the table the only lowest value of the indicator for each variable respectively. This lowest value is then compared to acceptable limit shown on the next column. The conclusion on the last column indicate the validity of outer model for each vaiable. From this summary, it is concluded that the outer model is valid. Hence the next step to analize the inner model to verify the hypothesis can be continued.

Table 5. Outer model evaluation

Criteria	Result	Acceptable value	Conclusion
	Outer Model		
Convergent Validity	*TQM implementation* (lowest value = 0.624) *Knowledge* (lowest value = 0.630) Skill (lowest value = 0.694) *Personal competence* (lowest value = 0.574) *Demonstrable performance* (lowest value = 0.632) ERP implementation (lowest value = 0.627) *Businees Performance* (lowest value = 0.816)	≥ 0.5	Valid
Discriminant Validity (measured by Square root of AVE)	*TQM implementation* = 0.691 *Knowledge = 0.578* *Skill* = 0.723 *Personal competence* = 0.716 *demonstrable performance* = 0.746 ERP implementation = 0.700 *Businees Performance* = 0.885	Sqrt AVE ≥ 0.5	Valid
Composite Reliability	*TQM implementation* = 0.784 *Knowledge* = 0.811 *Skill* = 0.815 *Personal competence* = 0.801 *Demonstrable performance* = 0.832 *ERPimplementation* = 0.787 *Businees Performance* = 0.879	≥ 0.7	Reliable

As the outer model validity has been verified, the next step is to examine the hypothesis through the analysis of inner model using PLS program. The result of the inner model analysis is shown in Table 6 below.

Hypothesis testing, as described previously, is conducted by assessing the path coefficient of each relationship between latent variable within the research model and also assessing the t-value of each patch coefficient value to verify the significancy of the path coefficient.

Tabel.6. Path coefficient and T-value of each variables relationship

	original sample estimate	mean of subsamples	Standard deviation	T-Statistic
X1 -> Y1 (H1)	0.390	0.389	0.101	3.874
X1 -> Y2 (H2)	0.241	0.255	0.123	2.138
X1 -> Y3 (H3)	0.065	0.063	0.132	0.490
X1 -> Y4 (H4)	0.134	0.194	0.150	1.961
Y1 -> Y5 (H5)	0.113	0.122	0.157	0.721
Y2 -> Y5 (H6)	0.413	0.422	0.127	4.721
Y3 -> Y5 (H7)	0.552	0.554	0.101	5.538
Y4 ->Y5 (H8)	0.220	0.224	0.113	2.024
Y5 -> Y6 (H9)	0.202	0.228	0.121	2.516

Based on significance level of 5% or t-value of 1.96, the result in Table 6 demonstrated that all path coefficients are positive but two of them are not significant (t-value < 1,96). This mean that two of hypothesis (H3 and H5) are not supported on this study.

As expected H1 is supported on this study which mean that TQM implementation (γ= .390 and t-value > 1.96) has impact on the knowledge of the project team in implementing ERP. This result confirm the previous research on the influence of TQM implementation on the knowledge of the project team. Hypothesis H2, TQM implementation (γ = .241 and t-value > 1,96) has impact on the skill of the project team in implementing ERP is also supported. This confirm previous research on the impact of TQM implemention on the skill of the project team. Unlike previous hypothesis, H3 is not supported on this study since t-value is less than 1.96. Hence the TQM implementation has no impact of the personal competence. Perhaps this is due to the fact that either the company implement TQM or not, the personal competence must be owned by every personnel working on the company. Hypothesis H4, TQM implementation (γ = .134 and t-value > 1,96) has impact on the knowledge of the project team in implementing ERP. This result supported the previous research on the impact of the TQM implementation on the knowledge of the project team.Hypothesis H5, Knowledge of the project team (β=.113 and t-value <1.96) has no impact on the successful implementation of ERP. Hypothesis H6, Skill of the project team (β=.413 and t-value >1.96) has impact on the successful implementation of the ERP. This result confirm the previous research that skill of the team has positive impact on the succesfull implementation of ERP. Hypothesis H7, Personal competence of the project team (β=.552 and t-value >1.96) has impact on the successful implementation of ERP. As expected this confirm the previous reseacrh on the impact of personal competence on the succesfull implementation of ERP. Hypothesis H8, demonstrable performance of the project team (β=.220 and t-value >1.96) has impact on the successful implementation of ERP. Hypothesis H9, Implementation of ERP (β=.202 and t-value >1.96) influence the improvement of business performance. As expected, this result confirm the previous research that ERP implementation has impact on business performance. Additional finding from this study is that indirect impact of TQM implementation on the ERP implementation through knowledge and personal competence is not supported. This due to the fact TQM implementation does not have impact on the personal competence and consequently it means that TQM implementation has no indirect impact on ERP implementation through personal competence. Tha same manner, since knowledge of the team has no impact on the ERP implemention, it has the meaning that TQM implementation has no impact on ERP implementation through knowledge of the team. Hence, it can be concluded that TQM implementation has impact on ERP implementation only through skill and demonstrable performance.

5. Conclusions

Based on the result of analysis, the research findings can be summarized as follows:

1. Implementation of TQM has positive impact on the knowledge of the project team.
2. Implementation of TQM has positive impact on the skill the project team.
3. Implementation of TQM has no impact on personal competence of the project team
4. Implementation of TQM has positive impact on demonstrable performance of the project team.
5. Knowledge of project team has no impact on ERP implementation
6. Skill of the project team has impact on ERP implementation.
7. Personal competence has no impact on ERP implementation.
8. Demonstrable good performance affect the ERP implementation
9. ERP implementation has positive impact on the business performance
10. TQM implementation has no impact on ERP implementation through knowledge of the project team.
11. TQM implementation has no impact on ERP implementation through personal competence.

5. References

[1] Castka, P., Bamber, C.J., Bamber, D.J. dan Sharp, J.M. Integrating Corporate Social Responsibility (CSR) into ISO Management Systems – in Search of a Feasible CSR Management System Framework, The TQM Magazine, 16 (3), 2004, pp. 216-224.

[2] Hong, J.W., dan Phitayawejwiwat, S. The Impact of ISO 9000 Certification on Quality, Management Practices in Thailand, 21 (1), 2005, pp.1-6.

[3] Houten, G. V. ISO 9001: 2000: A standard for all Industries, The Information Management Journal, April 2000, pp. 28-37.

[4] Huarng, F., Horing, C., & Chen, C.A Study of ISO Process, Motivation and Performance, Total Quality Management, 10 (7), pp. 1009-1025.

[5] Gaspersz, V.Manajemen Bisnis Total, PT. Gramedia Pustaka Utama, Jakarta, 2004.

[6] Jacobs, F.R., Chase, R.B. and Aquilano, N.J. Operation Management for Competitive Advantage (Tenth Edition), International Edition McGraw Hill, 2009.

[7] Love PED, Irani, Z. and Edwards DJ. 2003, "Learning to Reduce Rework in Projects: Analysis of Firms Organizational Learning and Quality Practices", Project Manager Journal 34 (3), 2003, pp.13–25.

[8] Meredith, J. R., and Mantel, S. J. 2004 Project Management A Managerial Approach 4/e, Published by John Wiley & Sons, 2004.

[9] Crawford, L. Senior Management Perceptions of Project Management Competence, International Journal of Project Management 23, 2005, pp. 7-16.

[10] Heywood L, Gonczi A, and Hager P. A Guide to Development of Competency Standards for Professions, Canberra: Australian Government Publishing Service, 1992.

[11] Hyvonen, J. Strategy Performance Measurement Techniques and Information Technology of the Firm and Their Links to Organizational Performance, Management Accounting Research 18, 2007, pp. 343–366.

[12] Su, Y.F and Yang, C. A Structural Equation Model for Analyzing the Impact of ERP on SCM, Expert Systems with Applications 37, 2010, pp.456-469.

[13] Soja, P. Succsess Factor in ERP Implementation: Lesson from Practice, Journal of Enterprise Information Management 19 (6), 2006, pp.646-661.

[14] Tsai, W., Shaw, M.J., Fan, Y. W., Liu, J.Y., Lee, K.C. and Chen, H.C. An Empirical Investigation of the Impacts of Internal/External Facilitators on the Project Success of ERP: A Structural Equation Model, Decision Support Systems 50, 2011, pp. 480–490.

[15] Sedera, D. and Gable, G.G. Knowledge Management Competence for Enterprise System Success, Journal of Strategic Information Systems 19, 2010, pp. 296-306.

[16] Granebring, A. and Revay, P. Enterprise Resource Planning Competence Centers: a Case Study, Kybernetes 34 (9/10), 2005, pp.1551-1562.

[17] Sun, A.Y.T., Yazdani, A. and Overend, J.D. Achievement Assessment for Enterprise Resources Planning (ERP) System Implementation Based on Critical Success Factors (CFS), International Journal Production Economics 98, 2005, pp. 189-203.

[18] Yusuf, Y., Gunasekaran, A. and Wu, C. Implementation of Enterprise Resources Planning in China, Technovation 26, 2006, pp.1324-1336.

[19] Wu, J.H. and Wang, Y. M. Measuring ERP success: The key-users "Viewpoint of the ERP to Produce a Viable IS in the Organization", Computer in Human Behavior 23, 2007, pp. 1582 – 1596.

[20] Mariethoz, Y.J and Probst, A.R. Business Concepts Ontology for an Enterprise Performance and Competences Monitoring, Computers in Industry 58, 2007, pp.118–129.

[21] Ghozali, I. Structural Equation Modeling Metode Alternatif dengan Partial Least Square, Badan Penerbit Universitas Diponegoro, Indonesia, 2008.