

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 5, May 2018

## Analysis of Implementing ISO 9001 Quality Management System towards the Quality Performance of Contractor on Infrastructure Project

Manlian Ronald. A. Simanjuntak.<sup>1</sup>, Barcellius Nicholas C<sup>2</sup>

Professor of Construction Management, UPH Graduate Program, Jakarta, Indonesia<sup>1</sup>

Graduate Program of Master of Civil Engineering, UPH Graduate Program, Jakarta, Indonesia<sup>2</sup>

**ABSTRACT:** The growth of infrastructure projects in Indonesia is a represent of the seriousness from the government in increasing the capacity and capability of construction to become the foundation of national development. It's seen from the infrastructure budget in the period of 2015-2017 is increasing by 123.4% from the previous period. West of Sumatra is an area at Indonesia which is the government focus on to be able to solve a number of land transportation infrastructure problems that have been wounded so far and it's included in Western Indonesian National Roads Improvement Projects (WINRIP). In the highly demand of contractors to execute the infrastructure projects, the performance of contractor became an issue recently. A lot of quality problems showed up in contractor company which had the certification of ISO 9001:2015. So with the help of reviewing the literature of Quality Management System, ISO 9001:2015, Contractor Performance, Infrastructure Project, Potrait of Contractor in Indonesia, and Relevant Researches will be the basis of this analysis to answers the problems of this research. Analysis performed with mix method of qualitative and quantitative. Interview is the part of qualitative method with 3 respondents and Questionnaires is the part of quantitative method with 39 respondents. Respondents should have a minimum of 3 years working experience to fill the quetionnaires. The data analysed by SPSS Program. The results shows that the determination of the parties who concerned and relevant to the quality management system in a company and improving the suitability, adequacy, and effectiveness of the quality management system are the essential requirements for successful implementation of the quality management system in contractor's company. Meanwhile, the culture of the employees is found as a constraint of implementing ISO 9001:2015 in contractor's company.

**KEYWORDS:** The Growth of Infrastructure Projects, Performance of Contractor, ISO 9001:2015

### I. INTRODUCTION

The growth of infrastructure projects in Indonesia turn up as a form of the government focus in increasing the construction capacity and capability as the foundation of the national economic development. It's seen as the increasement of the infrastructure budget for almost 123,4% or equivalent as 387.3 trillions rupiah. One of the area that the government focusing on the Infrastructure is West of Sumatra. It's shows up as the concern from the President of Indonesia, Joko Widodo to West of Sumatera for solving a number of issues that caused by land transportation infrastructure for a long time. Indonesia has a lot of contractors that can carry on the projects, it's seen from the construction institution in Indonesia called LPJK data shows up that Indonesia has 140.000 contractors and all the contractors that will completing the infrastructure project should have the ISO 9001 certification based on a regulation from PUPR Minister No. 9 Years of 2009. But, a lot of quality performance problems still showed up in contractors company. So, the aim of this research is to find out does implementing ISO 9001:2015 on Contractor's company will give an improvement for their performance, the indicators that can affect the implementation of ISO 9001:2015, how's the affect of implementing ISO 9001:2015 on Contractor's performance, what's the obstacles from implementing ISO 9001:2015, and what kind of improvement that can found from this research so that implementing ISO 9001:2015 will give the improvement more efficiently to the quality performance of contractor's company.

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 5, May 2018

## II. REVIEW OF LITERATURE

### Quality Management System

The Quality Management System is a set of documented procedures and standard practices for system management that aimed to assuring the conformity of a process and products (goods and services) to those requirements or regulations or specified by the customer or organization (Vincent Gaspersz, 2002). Quality Management Systems will review all activities of the overall management function which determines the quality policy, objectives and responsibilities, and implements them through tools such as: the determination and development of objectives and the need for quality and implementation of the quality management system (Quality Planning); the techniques and operational activities used to meet the quality requirements (Quality Control); planned and systematic actions that implemented and demonstrated to provide sufficient trust that the product will satisfy the need of the product quality (Quality Assurance); and actions taken to enhance the value of the product to the customer through enhancing the effectiveness and efficiency of processes and activities through the organizational structure of the company (Quality Improvement). Responsibility for quality management exists at all levels of management, but must be controlled by top management, and its implementation should involve all members of the organization. Indonesia adopted the ISO standard for the Quality Management System standard.

### ISO 9001:2015

The latest version of international standardization ISO 9001 which is the only one Quality Management Systems that give a certification to company that has implementing the quality management system. Has 10 clauses : Scope, Normative references, terms and definitions, context of the organization, leadership, planning, support, operation, performance evaluation, and improvement. There are 7 fundamentals in this ISO version: Customer focus, Leadership, People's Involvement, Process Approach, Improvement, Evidence Based Decision Making, and Relationship Management. The benefits of implementing ISO 9001:2015: consistency & compatible across all standards; reduce conflicts & duplication from different management system standards; ability to easily migrate other management systems into one, such as OH&S, environment, etc; Minimise replication of documentation; Focus on more important/high-risk processes (ISO 9001, 2015). From all of the ISO 9001 benefits, there are a lot of obstacles that may be the factors of this system failure : The commitment of top management; Lack of infrastructure support; Partial of the quality of management system; Knowledge of the Quality Management System; Culture of the organization; and the imperfection of the Quality Management System (Nasution, 2010).

### Performance of the Contractor's Company

Is a full view of the company over a certain period of time, is the result or achievement that is influenced by the company's operational activities in utilizing resources owned. Performance is a term generally used for part or all of the actions or activities of an organization for a period with reference to a standard amount such as past or projected costs, on the basis of efficiency, responsibility, or accountability of management. Contractor's Performance measured by 3 main performance : cost, quality, and time (Srimindarti, 2004). This research is limited by a quality performance of the company. So, the quality performance will be measured whether the company's achieved the quality performance or not using the Deming Cycle. The Deming Cycle is using the Plan – Do – Check - Action ways from the ISO 9001 to measure the quality performance. Plan: Conduct consumer research and use it for planning the product. The "product" here is the actual program you intend to conduct, and the "consumer research" is an examination of actual needs of the target population, the community, and others who will be affected. Thus, the "Plan" part of the cycle might include the following: Conducting a needs assessment, involving everyone concerned; Deciding what the desirable outcomes are, from the perspectives of the target population, the organization, and the larger community; Determining ways to reach those outcomes that are feasible, consistent with the guiding principles of the organization, inclusive (respectful of all and beneficial to as many people and groups as possible), and consistent with the needs and culture of the target population; Developing indicators to show when you have reached either outcomes themselves or significant points on the way to reaching those outcomes; and Inviting all stakeholders to participate in the development of the plan. Do: Produce the product. The "production" part of the process is the actual design of the program, outreach effort, treatment strategy, etc. that will meet the need determined in the "Plan" part of the cycle.

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 5, May 2018

Much of the actual work here depends not only on TQM principles (teamwork, employee involvement, scientific approach, obsession with quality, and customer focus), but also on common sense and organizing principles. The following are important elements to make sure that the "DO" part of the cycle has achieved: Finding out what has already been tried in the community, and how well it worked; Discovering whether there's any residual bad feeling attached to certain methods or approaches -- or people -- which may resurface if they're proposed again; Using as examples other communities that have successfully mounted similar programs, while remaining aware that not everything that works in one place will work in another; Consulting the research to see what has worked in this situation; Involving all stakeholders in the development of the program or initiative, especially the people who will do the actual work; and Taking care of the logistics: a place to operate, equipment and supplies, the proper staff and/or volunteers on board, etc. Check: Check the product to make sure it was produced in accordance with the plan. Compare the details and overall shape of the program or initiative to the plan. Does it align with the needs assessment? Does it look like it will address the desired outcomes in desired ways? Is it inclusive? Was everyone involved in its development? Is it feasible? Is it ready to go?. Act: Market the product. "Marketing the product" here means actually running the program or initiative that you've planned.

## Infrastructure's Project

A physical system that provides transportation, drainage, irrigation, building, and other public facilities, which is needed to fulfil various basic human needs both economic and social needs. (Grigg, 1988) Infrastructure itself consist of various physical facilities needed and developed by public agencies aimed at fulfilling social and economic objectives and governmental functions in terms of transportation, electric power, water supply, waste disposal, and other similar services (Stone, 1974).

## Potrait of Contractors in Indonesia

According to the General Director of Construction, Ministry of PUPR Mr. Yusid Yosyib in 2016, construction service companies in Indonesia still facing great challenges in meeting the needs of the Government, one of the important things that highlights this challenge is human resources. Recently, Contractors companies in Indonesia also attentioning public with a bad portrait. It's seen from the problems that showed up recently like the collapsed of retaining wall in Terminal 3 of Soekarno-Hatta Airport, the collapsed of Babat-Widang bridge in East of Java, and a lot of problems from the contractors quality management system.

## III. RESEARCH METHODOLOGY

The research mainly concentrated on investigating the benefit from implementing ISO 9001 to the quality performance of contractor, the indicators that affect the success of implementing ISO 9001, how can ISO 9001 affect the performance of contractor, obstacles from implementing ISO 9001, and the improvement so that ISO 9001 will give benefits more effectively. This research is limited by the point of view from the contractors, the projects is infrastructure, focusing on quality performance of contractor, and in the West of Sumatera. Analyzed has been done using mix method of analysis (qualitative & quantitative) to solve the research problems. For the quantitative method's, the indicators gotten from the literature studies. The studies shows that there's 3 indicators that can be used and has a relationship with the purpose of the research. The 1<sup>st</sup> Indicator is the reasons for the company to implementing ISO 9001 in their company from this indicator, all the variables in this indicator will be measure by 5 scales: 1 (Very Disagree: if the variable not related at all), 2 (Disagree : if the variable not related but has a consider at the first time), 3 (Quite relevant: if the variable is thought out), 4 (Agree: if the variable is the reason), 5 (Very Agree : if the variable is the reason and has been thought of as a something that can improve the company); 2<sup>nd</sup> Indicator is how well the company has run the requirements on the ISO 9001:2015 regulations, all the variables in this indicator will be measure by 5 scales: 1 (Very bad: Not considered to be done at all), 2 (Bad: Not considered), 3 (Moderate: In thought to do it), 4 (Good: If it has been done for almost 50%), 5 (Very Good: If it has been done for over 50%); the 3<sup>rd</sup> Indicator is the obstacles in the implementation of ISO 9001 in the company, measure by 5 scales: (1: Very Influential: The variable is the reason why the company can't implement the ISO 9001:2015 which is >50% effect), (2: Influential: The variable is the reason in range of <50% effect), 3 (Relevant: Maybe it's the reason), 4 (Disagree: Not related against the

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 5, May 2018

constraints), 5 (Very Disagree: Not related at all) . Primary data taken from respondents that works for contractor's company and should have 3 years experience. 39 data has obtained from the questionnaires distributed and 3 datas from the interview.

## IV. ANALYSIS AND DISCUSSION

### Benefits from implementing ISO 9001 QMS within the point of view from contractor

To know whether implementing ISO 9001 has made a benefit in contractor's company, an interview is used as the instrument. Interview was conducted to: 1) Mr. Robby as the President Director of PT RP; 2) Mr. Febrion as the Operational Director of PT RP; and 3) Mr. Eko as the Project Manager of PT HK. All of them stated and agreed that the implementation of ISO 9001 in their company has given a benefit. So that the analysis can be continues to find the indicators that affect the implementation of ISO 9001.

### The Indicators that affect the implementation of ISO 9001

We knew that by implementing ISO 9001 in contractor's company will give a benefit. To know what kind of benefit that the company can get and the obstacles that the company has experienced, the indicators that affect the implementation of ISO 9001 should be found. By doing the review of literature, found 3 indicators that affect. There are: The reasons for the company to implementing ISO 9001 in their company; how well the company has run the requirements on the ISO 9001:2015 regulations; and the obstacles in the implementation of ISO 9001 in the company. 12 variables has found from the reasons for the company to implementing ISO 9001 in their company indicator, 35 variables has found from how well the company has run the requirements on the ISO 9001:2015 regulations indicator; and 4 variables has found from the obstacles in the implementation of ISO 9001 in the company indicator.

### Validity Test

All of the variables from the indicators tested by using the SPSS program to see which variables are valid and which one is not. This test compared the value of Pearson's Correlation from the SPSS between all of the independent variables (X) with the dependent variable (Y). The variables taken are variables that have a Pearson's Correlation >0.4 with the dependent variable (Y). The result showed that only 14 variables have the Pearson's Correlation >0.4, there are: X8 ( Enable organizations to give stakeholders confidence for consistency, effectiveness, and efficiency); X12 ( Making the company more adaptable to change ); X13 (Manage all the relevant parties which have the competence and leadership of the quality management system); X14 (The organizations shall determine the external and internal issues that relevant to the organization's objectives and direction that affect its ability to achieve the desired results of the quality management system); X15 (The organization shall establish the limits and application of the quality management system to determine its scope); X17 (Top level of management should demonstrate leadership and commitment to the quality management system); X18 (Top management must establish, implement, and maintain the quality policy); X20 (Ensure that the existing processes provide the desired output); X29 (The people doing the work should be aware of the contribution to the effectiveness of the quality management system, including the benefits of improved performance); X33 (Company should control the external service providers and products when: products and services from external providers are intended to be incorporated into the organization's products and services; products and services provided directly to customers by the provider); X34 (Control of production and service provision); X46 (The organization shall continually improve the suitability, adequacy, and effectiveness of the quality management system); X50 ( The knowledge level of the worker in quality management system is low); and X51 (The culture of the worker doesn't support).

### Intercorrelation Test

All of the variables that have passed the Validity test are tested to see the intercorrelation between the independent variables (X). Intercorrelation test done for the 14 variables (X8, X12, X13, X14, X15, X17, X18, X20, X29, X33, X34, X46, X50, and X51) that are valid to make sure that the variables has a relationship each other. This test will comparing the value of Pearson's correlation of each independent variables (X) <0.4 & which one is >0.4. The variables that have Pearson's correlation <0.4 more than the >0.4 selected as a valid variables to continue the test. After comparing the

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 5, May 2018

value of Pearson's correlation, there are 6 variables valid for the factor & regression linear analysis, they are: X13 (Manage all the relevant parties which have the competence and leadership of the quality management system); X33 (Company should control the external service providers and products when: products and services from external providers are intended to be incorporated into the organization's products and services; products and services provided directly to customers by the provider); X34 (Control of production and service provision); X46 (The organization shall continually improve the suitability, adequacy, and effectiveness of the quality management system); X50 (The knowledge level of the worker in quality management system is low); and X51 (The culture of the worker doesn't support).

### Reliability Test

Reliability test has been done with SPSS program to see if the questionnaire is reliable or not. The test compared the Cronbach's alpha that is gotten from the program which the value of Cronbach's alpha is  $>0.6$  means that the questionnaire is reliable and if  $<0.6$  the questionnaire is not reliable. From this analysis we've got the value of Cronbach's Alpha is 0.919. It showed that the value  $0.919 > 0.6$ , which means that the questionnaires are reliable.

Table 1: Reliability Test

Cronbach's Alpha	N of Items
.919	52

### Factor Analysis

All variables that have been analysed in validity test, intercorrelation test, and reliability test used in factor analysis and identified to make sure the variables that are relevant and from the factor analysis shown which components that the variables in. The relevancy of the variables tested by the correlation between the independent variables and partial correlation. The first assumption is Determinant of Correlation Matrix test, if the Determinant value is near of the 0 value means that the correlation between variables is high. In this analysis, the Determinant value is 0.005 which is near of 0 value. So, the variables are correlating highly.

The second assumption of the factor analysis is to compare the Kaiser-Meyer-Olkin Measure of Sampling Adequacy value should be  $> 0.5$ , the KMO value in this case is 0.726 which means that the requirements of this assumption are fulfilled.

Table 2: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.726
Bartlett's Test of Sphericity	Approx. Chi-Square	187.463
	df	15
	Sig.	.000

Third assumption of the factor analysis is testing the significance level from the Bartlett's Test of Sphericity should be  $<0.05$  which means the assumption of the trust level is 95%. The value of significance in this analysis is 0.00 which means the requirement of the Bartlett's Test is fulfilled.

The last test of the factor analysis is MSA test, the MSA value should be  $>0.5$  on all variables that tested, results shown that 6 variables are fulfilled in this requirement and at the variance results shown that 2 components having

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 5, May 2018

eigenvalue > 1, means that from analysis factor showed that the variables will have 2 components. The 1<sup>st</sup> component consists of : X13 (Manage all the relevant parties which have the competence and leadership of the quality management system); X33 (Company should control the external service providers and products when: products and services from external providers are intended to be incorporated into the organization’s products and services; products and services provided directly to customers by the provider); X34 (Control of production and service provision); X46 (The organization shall continually improve the suitability, adequacy, and effectiveness of the quality management system) and the 2<sup>nd</sup> component consists of: X50 (The knowledge level of the worker in quality management system is low) and X51 (The culture of the worker doesn’t support).

### Linear Regression’s Analysis

Variables from the new components that obtained from the factor analysis tested with linear regression’s analysis to see how much is the correlation from the independent variables (X) with the dependent variable (Y). This test using the stepwise method. There are 4 tests that performed in this analysis, there are: R square test, F test, T test, and Durbin Watson’s Test). In R Square test, the value of correlation between the independent variables (X) with the dependent variable (Y) analysed to see how much the impact between the variables.

From the R Square test, shown that there are only 3 variables that give an impact to the contractor’s performance, there are: X13 (Manage all the relevant parties which have the competence and leadership of the quality management system) with the percentage of impact level = 56%; X46 (The organization shall continually improve the suitability, adequacy, and effectiveness of the quality management system) with the percentage of impact level =19.8%; and X51 (The culture of the worker doesn’t support) with the percentage of impact level = 4%. The total of the impact from all of the 3 variables against the contractor’s performance is 80.5%.

Table 2: Linear Regression’s Analysis – R Square

Model Summary <sup>d</sup>					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.753 <sup>a</sup>	.567	.555	.576	
2	.875 <sup>b</sup>	.765	.752	.430	
3	.897 <sup>c</sup>	.805	.788	.397	1.934
a. Predictors: (Constant), X51					
b. Predictors: (Constant), X51, X13					
c. Predictors: (Constant), X51, X13, X46					
d. Dependent Variable: Y					

The second test is F test. In this test, will comparing the value of F from SPSS analysis with the F value from the table, with the requirements: 1) F value from SPSS should > F table to show that the 3 variables simultaneously having an effect with the contractor’s performance and 2) the significance level should lower than 0.05 to show that the level of significance is high. F value from SPSS = 48.161 with the significance level of 0.00 and the F value from the table = 2.39. It showed that F value from SPSS > F value from the table with the significance level is high. So the 3 variables X13 (Manage all the relevant parties which have the competence and leadership of the quality management system); X46 (The organization shall continually improve the suitability, adequacy, and effectiveness of the quality management system); and X51 (The culture of the worker doesn’t support) simultaneously have an effect to the contractor’s performance with the level of significance is high.

# International Journal of Innovative Research in Science, Engineering and Technology

(A High Impact Factor, Monthly, Peer Reviewed Journal)

Visit: [www.ijirset.com](http://www.ijirset.com)

Vol. 7, Issue 5, May 2018

The third test is T test. This test will comparing the value of T from SPSS analysis with the T value from the table, with the requirements: 1) T value from SPSS > F table shows that the independent variable partially has an effect to the dependent variable and 2) the significance level should lower than 0.05 to show that the level of significance is high. The T value from the table is 2.03693, then comparing it with the : 1<sup>st</sup> variable (X13) has a T value from SPSS = 4.03, 2<sup>nd</sup> variable (X46) has a T value from SPSS = 2.678, and 3<sup>rd</sup> variable (X51) has a T value from SPSS = 4.886. So, it showed that: X13 (Manage all the relevant parties which have the competence and leadership of the quality management system ) partially has an effect with Y (contractor's performance); X46 (The organization shall continually improve the suitability, adequacy, and effectiveness of the quality management system) partially has an effect with Y (contractor's performance); ); and X51 (The culture of the worker doesn't support) partially has an effect with Y (contractor's performance). All of the 3 variables has a level of significance < 0.05 so all of the 3 variables (X13,X46, and X51) has a high level of significance.

The last test is D test or Durbin Watson test. This test will shown if the variables has an autocorellation or not, with the requirements:  $(4-DW) > DU < DW$ . DL & DU value got from the D table, with the DL value = 1.1612 and DU = 1.8587. The DW value from the SPSS analysis is 1.934. So with the requirements, we got the equation =  $2.1413 > 1.8587 < 1.934$ . So it show that there is no autocorrelation in this analysis.

## V. CONCLUSION

By implementing ISO 9001 QMS in contractor's company, will give an improvement to the company performance. The requirements from ISO 9001 that the company should do to get an improvement to the company performance are: manage all the relevant parties which have the competence and leadership of the quality management system and the organization shall continually improve the suitability, adequacy, and effectiveness of the quality management system. Other than that, the contractor's company in West of Sumatra has an obstacle from implementing ISO 9001 QMS as the culture of the worker doesn't support for implementing ISO 9001 QMS.

Improvements that the company can be done to maximize the benefits are: 1) The company should organize the competent parties in the field of Quality Management System that can give influence to all members of the company either from the top level of management or the lowest employees so that the Quality Management System can run well in the company. This can be done by starting from selection on the first interview of employees by HRD, choose objectively while determining the position of someone in the organization according to ability, cultivate a quality management system in all level of management by giving a training, briefing, and examples; 2) Organization must make continuous improvement to meet the suitability, adequacy, and effectiveness of quality management system such as conducting a good documentation system to facilitate discovery of the differences contained in enterprise quality management, creating better organizational structures so that enterprise management becomes better; and improving the quality of workers in Indonesia, strated from the background of family, education, and also the living environment. This things certainly can't be separated from the responsibility of the government to make improvements in the culture of the country, both from the ministry of culture and education (KEMENDIKBUD), ministry of worker (KEMENAKER), ministry of religion (KEMENAG), ministry of human development and culture coordinator (KEMENKO PMK), and also ministry of public works and human settlements (KEMENPUPERA) to lead and conducting the construction workers so that they can have a culture of discipline and responsible. With all of these improvements expected the contractor's company will have high competitiveness and the quality management system in the organization will getting better.

## REFERENCES

1. Vincent Gaspersz, "Total Quality management", PT Gramedia Pustaka Utama, 2001.
2. Logotheis N., "Managing for Total Quality", UK: Prentice Hall International Ltd, 1992.
3. Caecillia Srimindarti, "Balanced Scorecard Sebagai Alternatif untuk Mengukur Kinerja, Fokus Ekonomi, Vol. 3 No. 1, 2004.
4. Menteri Pekerjaan Umum Republik Indonesia, "PerMen PU No: 04/PRT/M/2009", 2009.
5. Grigg N., "Infrastructure Engineering and Management", John Wiley & Sons, 1988.

## International Journal of Innovative Research in Science, Engineering and Technology

*(A High Impact Factor, Monthly, Peer Reviewed Journal)*

Visit: [www.ijirset.com](http://www.ijirset.com)

**Vol. 7, Issue 5, May 2018**

6. K. Sathis Raja & Mubeena M., "Assesment of TQM in Construction Industry ", 2017.
7. Prof. Manjunathgouda & Prof. Supriya, "Assessment of Maturity Level of TQM in Construction Industry", 2017.
8. Peter Hoonaker, "Barriers and benefits of Quality Management in the Construction Industry", 2010.
9. Turgut Acikara, "Evaluations of Construction Project Participants Attitudes Toward Quality Management in Turkey", 2017.
10. Vaughan Coffey, "Organizational Culture and Quality Management System Implementation in Indonesia Construction Companies", 2016.
11. Made Arya, "Application of Quality Management System ISO 9001:2008 to Contractor", 2013.
12. Suryo Nugroho, "Review of QMS Implementation on Housing Project Management", 2012.
13. Yusuf Latief, "Critical factors in QMS for Profitability Optimization and Competitiveness of Construction Service Companies in Indonesia", 2008.
14. Henny Yunita & Anton Soekiman, "User Satisfaction Level Analysis of Construction Services Against Implementation of Quality Management System ISO 9001 in Contractors Company", 2016.
15. Biatna Tampubolon, "Analysis of Leadership Style and Work Ethics Factors on Employee Performance that has applied ISO 9001", 2007.