ISSN No:-2456-2165

Impact Analysis of QMS ISO 9001 Implementation on Service Organizations in Indonesia

Doto, Humiras Hardi Purba, Erry Rimawan
Magister Industrial Engineering, Mercu Buana University, Jakarta, Indonesia

Abstract:- More than one million organizations in the word have implemented the QMS ISO 9001 to improve their organization performance related quality, productivity, customer complaint and cost efficiency. The purpose of this study is to find the critical factor that affecting to the effectiveness of implementation of QMS ISO 9001 and its impact to organization performance in related to quality, productivity, customer complaint and cost efficiency. The 80 certified service companies was selected using simple random approach which represented by people who have responsibility to the effectiveness of QMS ISO 9001 implementation such as management representative, top management or key person of the implementation of QMS ISO9001. The requirement of respondent is the certified company which had certified more than 3 years. The main data of research was collected by questioner. Smart PLS 3.0, was utilized to test the research model which applying path and weighing model. The findings in this paper reveal that top management commitment, employee involvement and training and education have significant effect to the QMS ISO 9001 effectiveness of implementation as well as to the organization's performance (improve product / service quality, improve increasing productivity, decreasing production cost, and fewer customer complain). To increase the benefit of QMS ISO9001 implementation on this paper recommends that internal motivation, internal audit, financial support and team work should be improved.

Keywords:- *QMS ISO 9001, factor, benefit, performance, SEM_PLS*

I. INTRODUCTION

According to data survey of ISO 9001, in 2016 which published in September 2017 was shown that more than one million organization have implemented QMS ISO 9001 asshown on the figure. 1.

Fig 1:- Number of ISO 9001 certificate in the world, until in year 2016
(Source: Data of 2016 ISO survey)

Meanwhile, the number of ISO 9001 certificates in Indonesia, published annually, can be seen in Figure 1.2. Certified ISO 9001 certificates in Indonesia from 1993 - 2016 (source: ISO Survey data in 2016) are as follows:

Fig 2:- Number of ISO 9001 certificates in Indonesia validated from 1993 - 2016
(Source: Data of 2016 ISO survey)

In this research author will seek the critical factor that affecting to the effectiveness of implementation of QMS ISO 9001 as well as organization performance that including of quality, productivity, cost efficiency and customer complaint.

II. LITERATURE REVIEW

A. Quality And Quality Management System

Quality is fitness of use; quality is defined by customer. Customer satisfaction is achieved if customer desires fulfilled (Juran, 1989). Meanwhile Deming (1986) stated that quality is uniformity and reliability at low cost and accepted by market. Deming and Juran stated that quality is customer's perspective.

Crosby (1984), stated that quality is manufacturer or provider's perspective. Quality is just conformity to the requirements or specification. Therefore quality is defined as integrity that means just delivers what promised. Garvin (1988) was defined quality from customer's perspective that including: performance, feature, conformance, durability, marketing, aesthetics, and perceived quality.

Freeman-Bell and Grover (1994) stated that quality management is how the organization designs and implements the system to achieve that quality specifications / requirements. Meanwhile Dean and Bowen (1984) concluded that quality management system is built by three main components that include customer focus, process control and continual improvement.

ISSN No:-2456-2165

According Sun et.al (2004) MS ISO 9001:2008 provides a guideline to create their quality management system by establishing of procedure, control and documentation. The goal of implementation of QMS ISO 9001 is to provide consistency of product/service, meet customer requirements and regulatory requirements, and customer satisfaction and continuous improvement, noncompliance prevention (Goetsch and Davis, 2005).Terziovski et al. (2003) states that organizations that carry out voluntary and positive certification processes across broad-based dissemination tend to report on organizational performance improvements from organizations driven by customer pressure.

B. Benefit of QMS ISO 9001 Implementation

According to Tari et.al (2012) who have analysed many article concluded that the benefit of QMS ISO 9001 can be classified as the following: market share, export, sales and sales growth, profitability, competitive advantage, administration benefit (procedure), efficiency, improvement quality product / service, improve image, employee satisfaction, supplier relationship, relationship with authorities and stakeholders.

C. Critical factor of successfully and barriers of implementation of QMS ISO 9001

According to Poksinksa et al. (2006) found that the involvement and commitment of employees working for the organization, continuous improvement, and training and employee documentation are the factors that allow. Top Management commitment is also as key factor of successfully implementation of QMS ISO 9001.

According to Kaziliasas, (2010) found that the influence of strategic factors (top management), motivation factors, financial factors, continuous improvement factors and audit factors on the implementation of QMS ISO 9001.These factors had a significant positive impact on the implementation of quality management systems.

Many factors such as customer oriented behaviour, organization culture, process measurement and monitoring, employee satisfaction and their commitment are strategic factor in implementation QMS ISO 9001, in Srilankan organization. Albadran, (2014) lists various factors such as top management commitment, customer satisfaction, employee resistance, lack of financial resources, unwillingness to change systems and internal audit difficulties and others are barriers 0f ISO 9001 implementation.

According to Psomas and Antony (2015) the impact of certain critical factors such as internal motivation, external environmental stresses, employee characteristics, company attributes, and quality system attributes that affect to the effectiveness of QMS ISO 9001 implementation. All the factors have impact to QMS ISO 9001 implementation.

Jayasundara and Rajini, (2014) identified that internal support from management and staff, goals and quality management targets integrated with business goals, good management and good knowledge of quality management systems as key enabler in ISO 9001 implementation. Martínez Fuentes et al., (2000) found the facilitator that effect of ISO 9001implementation effectiveness is the top management involvement, employee engagement, early training, cooperative customer attitude, cooperative supplier attitude.

Gopal and Rajesh (2017) Stated that from extensive literary analysis, it has shown that the following factors that affecting to the effectiveness of QMS ISO 9001 are Communication, Commitment and involvement of top management, Training and education, Staff support and involvement, Teamwork, Motivation, Internal audit

D. Partial Least Square – Structural Equation Modelling

According to Monecke&Leisch (2012) SEM using PLS consist of three components, namely structural models, measurement models and weighing scheme. This third part is special feature od SEM with PLS and does not exist in co-varian-based SEM. IF describe the model will be as below:

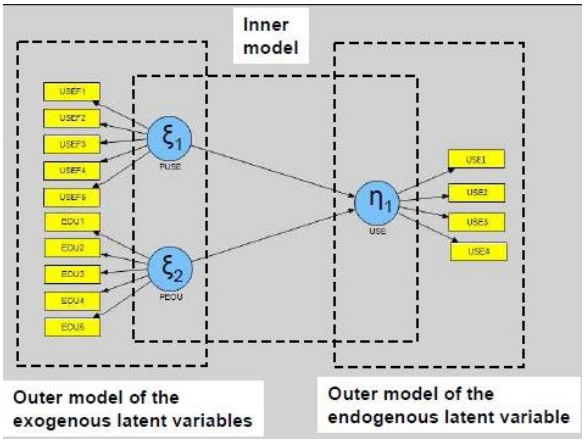

Fig 3:- PLS-SEM Model

SEM using PLS only allows the recursive relationship. This is the same as the path analysis not the same as the SEM covariant-base that also allows non recursive relationship.

In the structural model, which is also called the inner model, all latent variable are connected with one another based on theory of substance. The latent variable is devided into two, namely exogenous and endogenous. Exogenous laten variable are variable cause or variable without being preceded by other variables with arrow marking towards to other variables (endogenous latent variable).

The measurement model, also called the outer model, connects all manifest variable or indicator with its latent variable. In the PLS framework, one variable manifest can only be connected with one latent variable. All manifest variables are associated with one latent variable called a block. Thus every latent variable have manifest variable blocks. A block must contain at least one indicator. The way a block is connected to a latent variable can be reflective or formative (Wijayanto, 2008).

ISSN No:-2456-2165

According to Hair et.al (2011), the typical characteristic of SEM with PLS included SEM with PLS estimates the "loading" of the manifest / characteristic of variables rather than based on the variants divided among manifest / indicator variables on the same latent variable as occurs in covariant-base SEM. Thus "loading" are contributors to path coefficients. SEM with PLS offers acceptable results. for measurement model where structural model relationship are not significant. Conceptually the use of SEM with PLS in the same as the use of multiple linear regression, which is maximizing the variance explained in the endogenous latent variable (dependent variable) with the addition of assessing the quality of the data based on the characteristics of the measurement model. SEM user researchers with PLS named the reflective measurement model as model A while formative measurement model as model B. The SEM path model with PLS is the same as covariant-based SEM, which is based on path diagram from path analysis

Data used in PLS-SEM does not have to meet the requirements for assuming data normality. Thus PLS-SEM provides allowances for data that not normally distributed. This is different from covariant-based SEM which is known to many people where the normality of data becomes a necessity in the procedure. Thus PLS-SEm becomes an alternative procedure besides covariant-based SEM, because in practice / reality we often find that the data we are going to do is not normally distributed. Therefore , before we use this procedure, we should first test what our data distribution is. Even so, normally distributed data can also be used in PLS-SEM as we use the data in covariant-based SEM.

SEM using PLS only allows the recursive relationship. This is the same as the path analysis not the same as the SEM covariant-base that also allows non recursive relationship.

In the structural model, which is also called the inner model, all latent variables are connected with one another based on theory of substance. The latent variable is divided into two, namely exogenous and endogenous. Exogenous laten variable are variable cause or variable without being preceded by other variables with arrow marking towards to other variables (endogenous latent variable).

The measurement model, also called the outer model, connects all manifest variable or indicator with its latent variable. In the PLS framework, one variable manifest can only be connected with one latent variable. All manifest variables are associated with one latent variable called a block. Thus every latent variable have manifest variable blocks. A block must contain at least one indicator. The way a block is connected to a latent variable can be reflective or formative (Wijayanto, 2008).

According to Hair et.al (2011), the typical characteristic of SEM with PLS included SEM with PLS estimates the "loading" of the manifest / characteristic of variables rather than based on the variants divided among manifest / indicator variables on the same latent variable as occurs in covariant-base SEM. Thus "loading" are contributors to path coefficients. SEM with PLS offers acceptable results. for measurement model where structural model relationship are not significant. Conceptually the use of SEM with PLS in the same as the use of multiple linear regression, which is maximizing the variance explained in the endogenous latent variable (dependent variable) with the addition of assessing the quality of the data based on the characteristics of the measurement model. SEM user researchers with PLS named the reflective measurement model as model A while formative measurement model as model B. The SEM path model with PLS is the same as covariant-based SEM, which is based on path diagram from path analysis.

Data used in PLS-SEM does not have to meet the requirements for assuming data normality. Thus PLS-SEM provides allowances for data that not normally distributed. This is different from covariant-based SEM which is known to many people where the normality of data becomes a necessity in the procedure. Thus PLS-SEm becomes an alternative procedure besides covariant-based SEM, because in practice / reality we often find that the data we are going to do is not normally distributed. Therefore , before we use this procedure, we should first test what our data distribution is. Even so, normally distributed data can also be used in PLS-SEM as we use the data in covariant-based SEM.

If covariant-based SEM requires a large sample size that can include hundreds or even thousands of observation, then PLS-SEM is enough to use a small sample size. Small sample size with minimum requirements are 10 times the size of most formative indicators used to measure 1 latent variable or 10 times the largest number of structural paths addressed to certain laten variables in a structural model. Research conducted by Chin and Newsted (199) proves that only using 20 data they can use PLS-SEM correctly.

III. RESEARCH MODELAND HYPOTESIS OF RESEARCH

According to literature review, a model of research was determined. Outer factors are Top Management commitment, Good communication, Employee involved, adequacy of finance, Training and education, motivation, and external audit from certification body. Inner factors are performance of organization. The model of research is in line with similar researches conducted for the QMS ISO 9001 implementation. Seen on figure 3.1.

ISSN No:-2456-2165

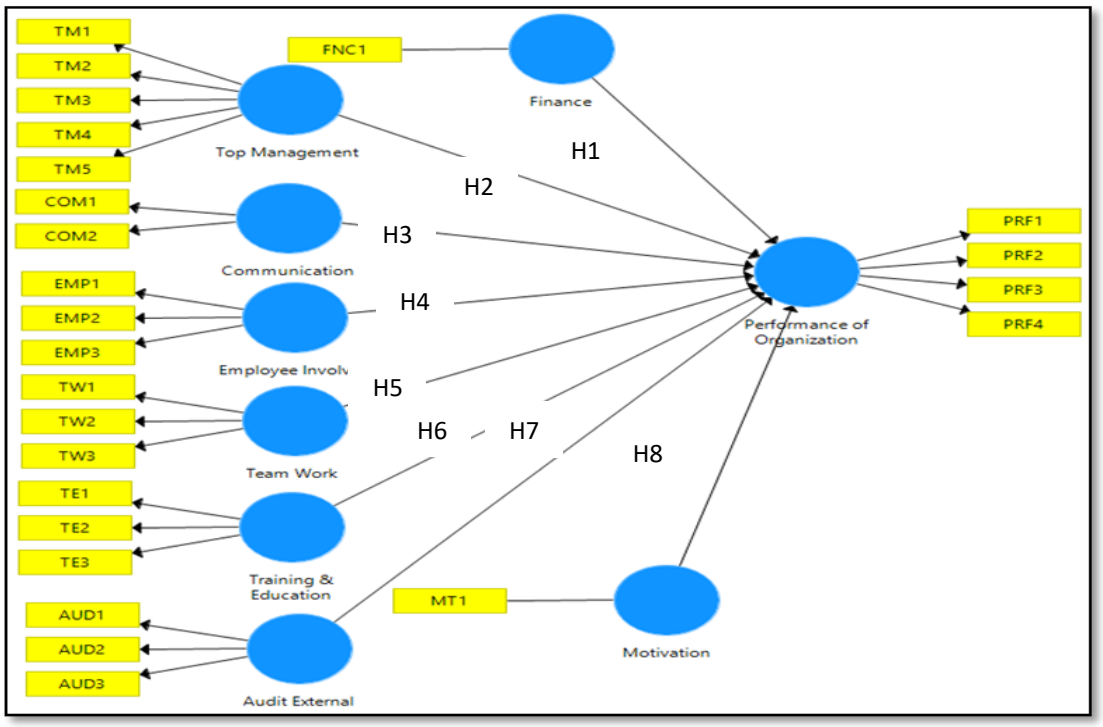

Fig 4:- Research Model

Consequently, research hypothesis regard the critical factor to the effectiveness of QMS ISO 9001 implementation as well as organization performance. In the following is the hypotheses of research are follows:

- H1: The Financial supports have positive effect on organization's performance
- H2: Top Management commitment has positive effect on organization's performance
- H3: Communications have positive effect on organization's performance
- H4: Employee involved has positive effect on organization's performance
- H5: Team works have positive effect on organization's performance
- H6: Training and education have positive effect on organization's performance
- H7: External Audit has positive effect on organization's performance
- H8: Motivation have positive effect on organization's performance

IV. METHODOLOGY

To examine the hypotheses data were collected from certified ISO 9001 company which have certified more than 3 years or minimum once cycle certification through a Google drive (n=80). SmartPLS 3.0 was utilized to evaluate the reliability and validity of research model and also to assess the research hypotheses.

V. RESULTS

A. Reliability and validity examination

Measurement models are assessed using reliability and validity. For reliability, Cronbach's alpha can be used. This value reflects the reliability of all indicators in the model. The minimum value is 0.7 while ideally is 0.8 or 0.9. BesidesCronbach's Alpha, the composite reliability (CR) value that is interpreted is the same as the value of Cronbach's Alpha.

Each latent variable must be able to explain each indicator variant at least 50%. Therefor the absolute correlation between the latent variable and the indicator must be > 0.7 (The absolute value of the outer standard loading). Reflective indicators should be removed from the measurements model if they have an outside raw loading value below 0.4.

The reliability and validity of check was reported on the following table 5.1.

ISSN No:-2456-2165

Construct Reliability and Validity

Matrix | Cronbach's Alpha | rho_A | Composite Reliability | Average Variance Extracted (... | Copy to Clipb

	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted (AVE)
Audit External	0.894	0.902	0.934	0.824
Communication	0.863	0.889	0.935	0.878
Employee Involved	0.702	0.705	0.835	0.629
Finance	1.000	1.000	1.000	1.000
Motivation	1.000	1.000	1.000	1.000
Performance of Organization	0.895	0.897	0.927	0.761
Team Work	0.750	0.749	0.857	0.667
Top Management	0.854	0.869	0.895	0.633
Training & Education	0.797	0.799	0.882	0.714

Table 1. Value of Cronbach'S Alpha, CR and AVE

According to table 5.1 we can be seen that all variables have Cronbach's Alpha value > 0.7 and Composite Reliability value also > 0.7. And the conclusion is that the structural model has high level of internal consistency reliability.

Average Variant Extracted (AVE) is evaluated to check convergent validity each latent variable. And the result can be seen on table 5.1. and it is found that all of AVE value have greater value more that the threshold limit 0.5, so convergent validity is confirmed.

Fornell and Larcker (1981) stated that the square root of AVE in each latent variable can be used to established discriminant validity, if this value is larger than other correlation values among other latent variables. The result can be seen on table 5.2.

Discriminant Validity

Fornell-Larcker Criteri... | Cross Loadings | Heterotrait-Monotrait R... | Heterotrait-Monotrait R... | Copy to Clipboard: | Excel F

	Audit Ex...	Comm...	Employee...	Finance	Motivation	Performa...	Team W...	Top Man...	Training...
Audit External	0.908								
Communication	0.312	0.937							
Employee Involved	0.523	0.702	0.793						
Finance	0.419	0.686	0.645	1.000					
Motivation	0.277	0.294	0.556	0.411	1.000				
Performance of Organization	0.551	0.542	0.722	0.637	0.381	0.872			
Team Work	0.414	0.680	0.735	0.616	0.439	0.552	0.817		
Top Management	0.355	0.565	0.674	0.550	0.751	0.578	0.633	0.795	
Training & Education	0.461	0.739	0.755	0.684	0.413	0.737	0.667	0.633	0.845

Table 2. Discriminant validity

According to table 5.2 we can see that all Fornell – Lacker Criterion value of discriminant validity, is larger than other correlation values among other latent variables. So, discriminat validity is confirmed.

B. Result of SEM-PLS

Procedure of bootstrapping is used to evaluate the significant of both the inner and outer model. During bootstrapping a large number of subsample (e.g. 5000) are taken from the original sample with replacements to give bootstrap standard errors which in turn gives approximate T value and P value for significant testing of structural path. And the result can be seen on table 5.3 as the following below:

ISSN No:-2456-2165

Path Coefficients

Mean, STDEV, T-Values, P-Va... | Confidence Intervals | Confidence Intervals Bias C... | Samples

	Original Sampl...	Sample Mean (...	Standard Devia...	T Statistics (|O...	P Values
Audit External -...	0.162	0.195	0.111	1.467	0.143
Communicatio...	-0.218	-0.163	0.157	1.389	0.165
Employee Invol...	0.384	0.378	0.140	2.752	0.006
Finance -> Perf...	0.225	0.194	0.126	1.783	0.075
Motivation -> ...	-0.187	-0.171	0.098	1.895	0.059
Team Work ->...	-0.103	-0.117	0.135	0.763	0.446
Top Managem...	0.223	0.214	0.116	1.923	0.055
Training & Edu...	0.384	0.362	0.169	2.267	0.024

Table 3. Result of PLS-SEM

According to the table 5.3 we can conclude that only Employee involved, Top management commitment and training and education have T-Value > 1,96 and P-Value < 0,05. So, Employee involved, Top management commitment and training and education have significant impact to organization's performance (improve product / service quality, improve increasing productivity, decreasing production cost, and fewer customer complain).

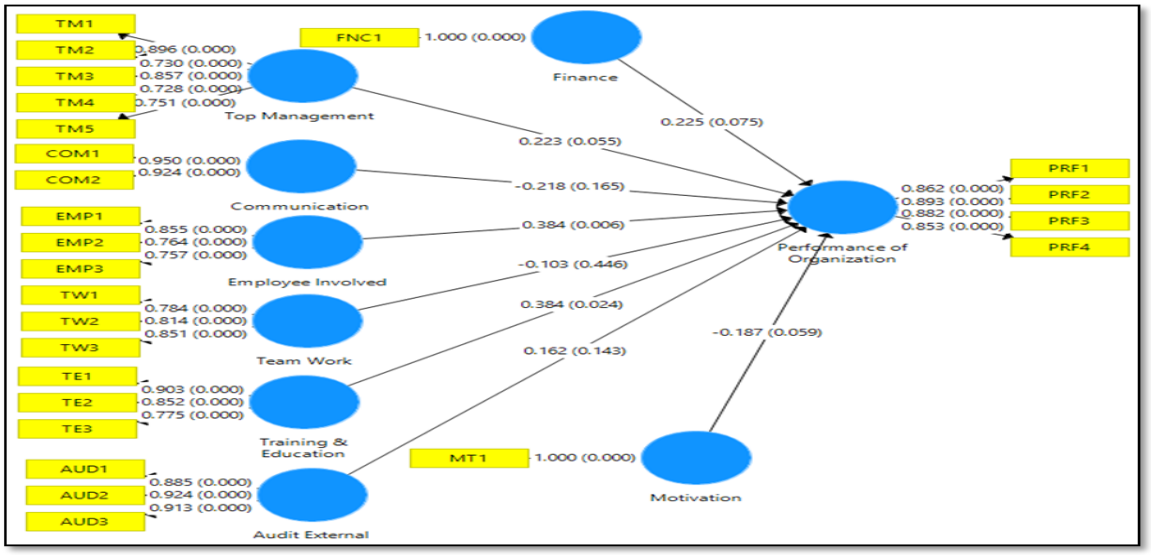

Fig 5:- Path Model and PLS-SEM Result

VI. CONCLUSION AND IMPLICATION

This paper confirmed that Top Management Commitment, employee involvement, training and education have impact to the effectiveness of QMS ISO 9001 implementation as well as the organization performance (improve product / service quality, improve increasing productivity, decreasing production cost, and fewer customer complain). Through a survey of ISO 9001 certified service companies and SEM-PLS, model was confirmed. And author emphasis that to improve the benefit of QMS ISO 9001 implementation, organization should increase the Top Management Commitment, employee involvement, training and education.

This paper has discussed the use of a second-generation multivariate data analysis method called Partial Least Square Structural Equation Modelling (PLS-SEM) for Business research, with a focus on Partial Least Squares (PLS) which is an emerging path modelling approach. PLS-SEM is capable of handling data inadequacies such as non- normal data and accommodates formatively measured constructs, the latter of which have recently gained increasing prominence. In this research, Researcher confirmed that PLS- SEM is fit for the analysis. In this case circumstances are limitation, applications have little available theory Predictive and accuracy is paramount

REFERENCES

1. Albadran, A. (2014) Review of ISO 9000 effective implementation in various organizational structures. Industrial Science, 1(7), 1-14.
2. Hoyle, D. (2009) ISO 9000 Quality System Handbook, Using the Standards as a Framework for Business Improvement. Butterworth-Heinemann.
3. Ilango, M., & Shankar, C. (2017). An approach to appraise the factors affecting implementation of quality management systems in construction project – ISM approach. International Research Journal of Engineering and Technology, 4(4), 2389-1392.
4. Jayasundara, A.J.M.D.C. and Rajini, P.A.D. (2014) Enablers and barriers of implementing ISO 9001 - Quality Management System (QMS) in the service sector in Sri Lanka, Proceedings of the Peradeniya Univ. International Research Sessions, Sri Lanka, Vol. 18, 4th & 5th July, 2014.
5. Kaziliunas, A. (2010). Success factors for quality management systems: certification benefits. IntelektineEkonomika, 2(8), 30-38.
6. Lewis, W. G., Pun, K. F., &Lalla, T. R. M. (2005). An Empirical Analysis of ISO 9004: 2000 Maturity in ISO 9001 Certified SMEs. Asian Journal on Quality, 6(3), 190-203.
7. Martínez Fuentes, C., BalbastreBenavent, F., Angeles Escribá Moreno, M., González Cruz, T., &Pardodel Val, M. (2000). Analysis of the implementation of ISO 9000 quality assurance systems. Work study, 49(6), 229-241.
8. Poksinska, B., Eklund, J. A., &Dahlgaard, J. J. (2006). ISO 9001: 2000 in small organisations: Lost opportunities, benefits and influencing factors. International Journal of Quality & Reliability Management, 23(5), 490-512.
9. Poksinska, B., JörnDahlgaard, J., & Antoni, M. (2002). The state of ISO 9000 certification: a study of Swedish organizations. The TQM Magazine, 14(5), 297-306.
10. Psomas, E., & Antony, J. (2015). The effectiveness of the ISO 9001 quality management system and its influential critical factors in Greek manufacturing companies. International Journal of Production Research, 53(7), 2089-2099.