Analysis of Implementation Level and Barriers in Implementing Quality Management System ISO 9001 in Electricity Sector Company: A Case of PT. ABC

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Abstract

The purpose of this study is to analyse the implementation level of quality management system ISO 9001 in Electricity Sector Company in Indonesia, including the barriers during the implementation. Quantitative analysis is performed to determine the implementation level of ISO 9001 based on the seven quality management principles. The data in this descriptive study were obtained through a survey. A number of 84, out of 105 samples of PT ABC business units that are engaged in electricity generation, transmission, distribution, or supporting units in Indonesia participated in the survey. The questionnaire in the survey is developed based on previous studies and the quality management system standard. The results show that process approach, customer focus, evidence-based decision making, relationship management, leadership principle, and improvement have near to good implementation level, while engagement of people have a slightly good implementation level. The results also indicate that there are five main barriers in which were experienced during the implementation of ISO 9001, consisting of two behavioural and cultural barriers, two technical barriers, and one organizational barrier.

Keywords

Quality Management System, ISO 9001, Implementation Level, Barrier, Indonesia, Electricity Company.

1. Introduction

The Law No 30 (2009), which regulates electricity in Indonesia, emphasizes that electricity has an important contribution and strategic role in supporting the achievement of national development goals. PT. ABC is a State-Owned Enterprise (BUMN) which is responsible for providing electricity supply to the public. The electricity supply business activities carried out by PT ABC include electricity generation, transmission, distribution, and electricity sales. Based on PT ABC's statistical publications, at the end of 2018, the number of PT ABC's customers reached 71.917.397 customers with electricity sales reaching 234.617.88 GWh (Giga Watt-hours). In providing electricity services to the customers, PT ABC has to meet the service quality level based on the Decree of the Directorate General of Electricity. PT ABC implements Quality Management System (QMS) ISO 9001 in all of its business units to meet the specified service quality level and to achieve customer satisfaction, and to meet the requirements of other relevant stakeholders such as the government.

However, companies do not always get the desired results when implementing ISO 9001 due to ineffective implementation (Psomas et al. 2010). Most companies experience problems in implementing ISO 9001, both during the certification process and after the certification process (Chow-Chua et al. 2003). Hence, identifying the barriers and obstacles in implementing ISO 9001 will help to increase its effectiveness to improve the company's performance and to build sustainable competitive advantage (Psomas et al. 2010). The company's actions in dealing with barriers encountered when implementing ISO 9001 quality management system can support the achievement of the objectives and effectiveness of its implementation. Therefore, this study aims to examine the implementation level of quality management system ISO 9001 in the electricity sector company and identify its main barriers. Although there are so many ISO 9001 related studies, however, studies on ISO 9001 at the electricity sector company, especially in Indonesia, is very limited. Hence, the results are expected to provide insights on the implementation level of ISO 9001, along with the main barriers at PT ABC's business units, and recommendations of actions to deal with the problems.

The data in this quantitative descriptive study is obtained through a survey conducted on PT ABC business units that are engaged in electricity generation, transmission, distribution, and supporting units in Indonesia.

The remainder of the paper is structured as follows. Relevant literature review is explained in Section 2, while methodology is explained in Section 3, findings and discussions in Section 4, and conclusions in Section 5.

2. Literature Review

The ISO 9001 standard was originally published in 1987 (the first edition). The second and third editions were published in 1994 and 2000. Currently, the latest ISO 9001 standard is ISO 9001:2015. The standard is the fifth edition published on 15 September 2015, replacing the fourth edition, ISO 9001:2008. The ISO 9001 standard is an international standard that is used to develop, design, and implement a quality management system (QMS) in a company and aims at customer satisfaction by meeting applicable requirements and regulations (Abuhav 2007). By implementing ISO 9001, it allows companies to (1) provide products or services that consistently meet customer requirements, (2) provide products or services that meet the requirements of applicable laws or other regulations, and (3) improve customer satisfaction through the use of instruments in the ISO 9001 standard which include planning and improving processes according to BSI British Standards.

Quality Management Principle is defined as a set of beliefs, norms, rules, and fundamental values that are accepted as true and used as a basis for quality management (ISO 2015). Quality management principles can be used by companies as a guide to improve its performance (ISO 2015), which can further help companies to improve the effectiveness of ISO 9001 implementation. All ISO 9001 requirements are interrelated with one or more of the Quality Management Principles and are the basis in the ISO 9001 requirements (Hoyle 2009). Quality Management Principles are (ISO 2015): customer focus; leadership; involvement of people; process approach; improvement; evidence-based decision making; and relationships management.

Research on the application or implementation of ISO 9001 has been carried out among others by Arribas Díaz, and Martínez-Mediano (2018), Elshaer and Augustyn (2016), Willar et al. (2015), Psomas et al. (2013), To et al. (2011), Psomas et al. (2010), Yu et al. (2012), Lee et al. (2009), and Yahya and Goh (2001). While research on barriers experienced by companies when implementing ISO 9001 has been carried out among others by Anholon et al. (2018), Willar et al. (2015), Abdullah et al. (2013), Chow-Chua et al. (2003), and Ab Wahid and Corner (2009). The characterization of ISO 9001 implementation status in a company or organization can use the ISO 9001 clause (Yahya and Goh 2001) and ISO 9001 requirements are related to quality management principles (Hoyle 2009), quality management principles is used to measure ISO 9001 implementation. Elshaer and Augustyn (2016), in their research, use the dimensions of quality management namely employee management, top management leadership, supplier management, customer focus, quality data and reporting as well as process management. Willar et al. (2015), in their research on the implementation of a quality management system for construction companies in Indonesia using dimensions such as leadership, customer focus, process approach, systems approach, continuous improvement, people involvement, evidence-based decision making and mutually beneficial supplier relationships. Research conducted by To et al. (2011), Yu et al. (2012), and Lee et al. (2009), on the other hand, use the dimensions of quality management principles. Anholon et al. (2018), in their research on ISO 9001 barriers, divide barriers to implementation in four latent variables, namely difficulties associated with employees, difficulties associated with QMS structuration, difficulties associated with integration, and difficulties resulting from the planning. Willar et al. (2015) identify 14 barriers in his research where the top five barriers of ISO 9001 are a matter of fulfilling audit requirements, misleading QMS purposes, lack of a well-designed reward system, failure in disseminating ISO 9001-QMS and lack of effective management response. Abdullah et al. (2013), in their research on ISO 9001 barriers in government institutions in Malaysia, divide barriers into four categories, namely organizational barriers, resource barriers, behavioral and cultural barriers, and technical barriers, while Chow-Chua et al. (2003) divide barriers into two periods, namely barriers during the ISO 9001 certification process and barriers after the ISO 9001 certification process. Lastly, Ab Wahid and Corner (2009) divide the barriers in their research into three categories, namely people, subcontractors, and communication of information.

3. Methodology

3.1. Target Population and Sample

The target population in this study are PT ABC business units which are engaged in electricity generation, transmission, distribution, or supporting units in Indonesia and ISO 9001 certified. The target sample in this study is 105 business units from a population of 145. The sampling is conducted by using a stratified random sampling method (see Table 1).

Table 1. Target population and sample.

	Business unit (unit)			
	Generation	**Transmission**	**Distribution**	**Supporting**
Target population	22	17	85	21
Sample	16	16	61	15
Percentage (%)	17%	11%	58%	14%

The criteria of respondents that participate in this survey are: (1) permanent employees in the respective business units; (2) have structural or functional positions; (3) have been working at PT ABC with a minimum of two years period; and (4) they are involved in ISO 9001 implementation or have attended quality management system ISO 9001 training.

3.2. Measurement and Questionnaire

A questionnaire is a popular method in ISO 9001 study (Magd 2008). The questionnaire in the survey is developed based on relevant previous research and quality management system standard to measure implementation level and barrier in implementing ISO 9001. We use seven quality management principles: (1) customer focus; (2) leadership; (3) involvement of people; (4) process approach; (5) improvement; (6) evidence-based decision making; and (7) relationships management used to measure implementation level of ISO 9001, similar to the studies by Willar et al. (2015), Yu et al. (2012), To et al. (2011), and Lee et al. (2009). To measure barriers in implementing ISO 9001, this study divides barriers into (1) organizational barriers; (2) behavioural and cultural barriers; and (3) technical barriers based on the study by Abdullah et al. (2013), and we exclude resource barriers because as a State-Owned Enterprise, PT ABC has been supported with adequate resources and some of resource barriers indicators have been included in others barriers category.

The Questionnaire was divided into three sections of questions: (1) organization and respondent information; (2) implementation level of ISO 9001; and (3) barriers in implementing ISO 9001. There are 29 questions about ISO 9001 implementation and 18 questions about ISO 9001 barriers. Six-point Likert scale is used to gather respondent opinion about the implementation level of ISO 9001 (1 = “strongly disagree/implementation is not very good”, 2 = “disagree/implementation is not good”, 3 = “slightly disagree/implementation is slightly not good”, 4 = “slightly agree/implementation is slightly good”, 5 = “agree/implementation is good”, and 6 = “strongly agree/implementation is very good”) and barriers in implementing ISO 9001 (1 = “strongly disagree/barrier is never or very rarely experienced”, 2 = “disagree/ barrier is rarely experienced”, 3 = “slightly disagree/barrier is slightly rare experienced”, 4 = “slightly agree/ barrier is slightly often experienced”, 5 = “agree/barrier is often experienced”, and 6 = “strongly agree/ barrier is very often experienced”).

Face validity is conducted before the final survey with four quality management representatives or ISO 9001 team members from PT ABC’s main units. They filled out the draft questionnaire and are asked about their opinions regarding the content of the questions and the time needed to complete the questionnaire. After revising the questionnaire, we conduct the survey, and the results are analysed using IBM SPSS version 22. The validity of each indicator is assessed using factor analysis (Psomas et al. 2010), while Cronbach's alpha is used to assess the reliability of the variables, in which Cronbach's alpha values below 0.6 indicate poor internal consistency (Malhotra et al. 2017; Sekaran and Bougie 2016).

4. Findings and Discussions

4.1. Business Unit and Respondents’ Profile

From a target sample of 105 business units, 84 completed questionnaires are obtained, resulting 80% response rate. From 84 business units participating in the survey, 14 (16.67%) are generation units, 12 (14.28%) are transmission units, 43 (51.19%) are distribution unit, and 15 (17.86%) are supporting units. The geographic locations of the business units that participate in this study spread across Indonesia, including 35 units (42%) in Java Island, 22 units (26%) in Sumatra Island, 12 units (14%) in Kalimantan Island, six units (7%) in Sulawesi Island, two units (2%) in West Nusa Tenggara Island, four units (5%) in East Nusa Tenggara Island, one unit (1%) in Bali Island and two units (3%) in Bangka Belitung Island. Respondents in this study have 4 - 10 years (43%) and more than 10 years (45%) of working experience. Lastly, 53% of respondents have an undergraduate degree, and 42% of respondents are in the 30 – 40 years of age.

4.2. Validity and Reliability

SPPS version 22 is used to determine the validity and reliability of the indicators. Factor analysis and reliability test for ISO 9001 implementation level and barriers in implementing ISO 9001 shown in Table 2 and Table 3.

Appendix A (Table A1 and Table A2) show that the factor loadings of all indicators are more than 0.4 (Black and Babin 2019). Kaiser-Meyer-Olkin (KMO) value more than 0.5 (Malhotra et al. 2017), Bartlet's significance value, eigenvalue, and cumulative variance value indicates good validity. The reliability of all seven quality management principles and barriers dimension considered acceptable because of the Cronbach's alpha values of more than 0.6 (Malhotra et al. 2017) (Sekaran and Bougie 2016).

4.3. Implementation Level of ISO 9001

The descriptive statistic approach using SPSS version 22 is used to analyse the implementation level of ISO 9001.

Table 2. Implementation level of ISO 9001.

Quality management principle	Mean	SD[a]
Customer focus	4.723	0.9052
Leadership	4.560	0.8769
Engagement of people	4.330	0.8234
Process approach	4.893	0.8125
Improvement	4.536	0.7973
Evidence-based decision making	4.652	0.8233
Relationship management	4.624	0.7550

[a]SD : standard deviation
1 = strongly disagree/ implementation is not very good
2 = disagree/ implementation is not good
3 = slightly disagree/ implementation is slightly not good
4 = slightly agree/ implementation is slightly good
5 = agree/ implementation is good
6 = strongly agree/ implementation is very good

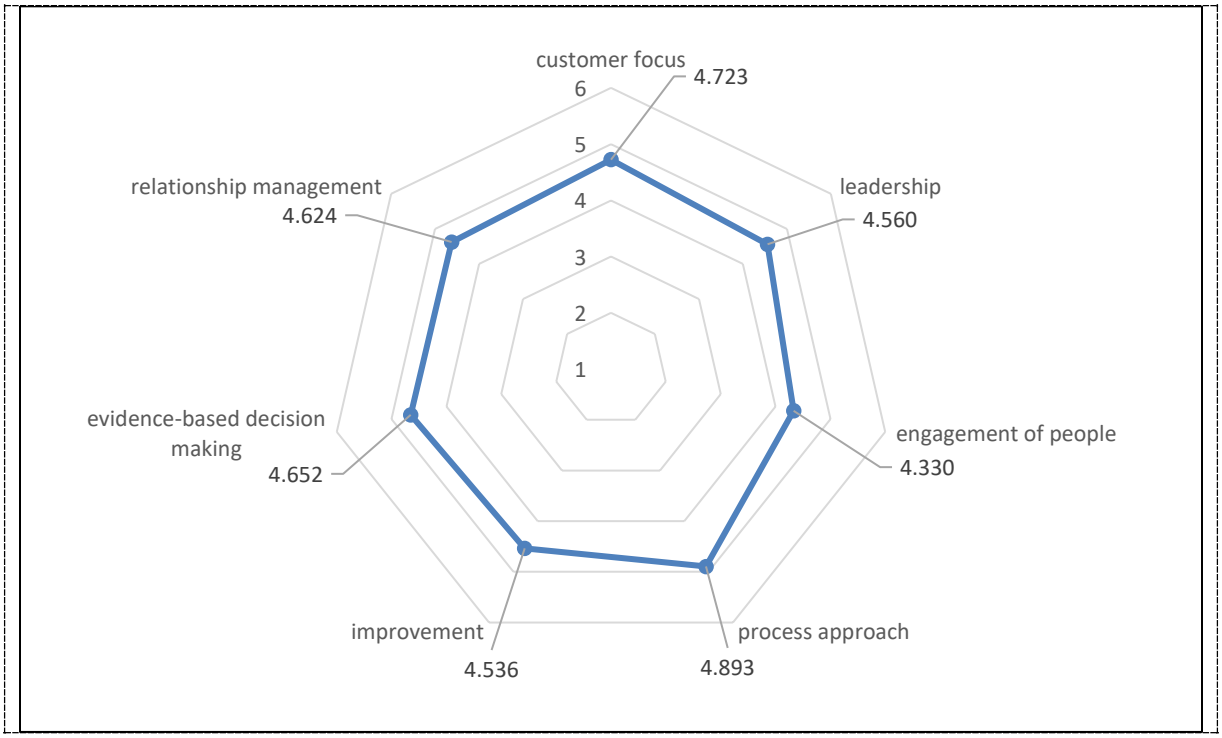

Figure 1. Graphic of the implementation level of ISO 9001.

Table 2 and Figure 1 show the ISO 9001 implementation level based on the respondents' opinions. As shown in Table 2 and Figure 1, in general, the level of implementation of ISO 9001 in the electricity sector companies in Indonesia is at a value of 4.00 – 5.00, where the level of implementation is slightly good to good. The process approach has the highest implementation level score of 4.893. Customer focus, evidence-based decision making, relationship management, leadership, and improvement have more than 4.500 scores close to 5.00 (level of implementation is good). The principle of quality management with the lowest level of implementation is the engagement of people that have a score of 4.330. The standard deviation value is relatively small to the mean value indicates that the data point is close to the mean (Field 2009). Figure 1 also shows that there is a gap in the implementation of ISO 9001 in electricity sector companies on seven quality management principles, where the implementation score is around 4.00 out of 6.00.

There are opportunities to improve the effectiveness of ISO 9001 implementation in all aspect of the quality management principle. The improvement of engagement of people can be done by (1) communicating to the employees concerning the importance of their contribution, (2) promoting the collaboration and coordination within the company, (3) facilitating ideas, knowledge, and experience sharing, (4) recognizing and appreciating employees' contribution, (5) involving all employees in improvement activities, and (6) enhancing trust and cooperation within the company (ISO 2015). To improve the application of leadership principles, top management of the company can do the following: (1) encouraging all functional management to demonstrate their involvement in the ISO 9001 implementation, (2) communicating the vision, mission, and policy on a regular basis, (3) providing the resources and training needed, and (4) build commitment & engagement of all employees towards quality and the ISO 9001 implementation (ISO 2015).

The company should also take into account the barriers experienced during the ISO 9001 implementation so that every action and improvement program can improve the effectiveness of ISO 9001 implementation.

4.4. Barriers in Implementing ISO 9001

Descriptive analysis for barriers in implementing ISO 9001 is shown in Table 3. Five highest barriers experienced have a score which is close to 4.00 ("barrier is slightly often experienced").

Table 3. Five highest barriers in implementing ISO 9001.

Barriers	Mean	SD[a]
BEHB6 The perception that ISO 9001 is only the responsibility of quality management representatives	3.82	1.466
TECH1 Lack of understanding of ISO 9001 quality management systems	3.79	1.262
TECH2 Difficulties in interpreting ISO 9001 clauses	3.60	1.272
BEHB4 Lack of understanding and awareness related to the benefits and importance of ISO 9001	3.57	1.356
ORGB6 Lack of training or knowledge sharing regarding ISO 9001	3.56	1.434

[a]SD : standard deviation
1 = strongly disagree/ implementation is not very good
2 = disagree/ implementation is not good
3 = slightly disagree/ implementation is slightly not good
4 = slightly agree/ implementation is slightly good
5 = agree/ implementation is good
6 = strongly agree/ implementation is very good

Barrier in implementing ISO 9001 which has the highest value is the perception that ISO 9001 is only the responsibility of quality management representatives, from the behavioural and cultural barriers category (BEHB6). That barrier is related to the engagement of people principle that has the lowest implementation level score. To overcome that barrier (BEHB6), by using leadership principles, a leader should create unity of purpose and environment condition in which people within a company are engaged in achieving the company objectives (ISO 2015).

Four other barriers are lack of understanding of ISO 9001 quality management system (TECH1), difficulties in interpreting ISO 9001 clause (TECH2), lack of understanding and awareness related to the ISO 9001 benefits and importance (BEHB4), and lack of training or knowledge sharing regarding ISO 9001 (ORGB6), that seems interrelated.

Understanding and awareness of ISO 9001 are important, Hoyle (2018) states that making employees aware of the implications of not conforming to ISO 9001 is part of the employee engagement process. Overcoming those barriers will help the company to improve the engagement of people implementation level, stated in Figure 1. Developing the ISO 9001 knowledge within the company through training, knowledge sharing, and other methods can help reducing the difficulty in understanding and interpreting ISO 9001 clause, so it can help to improve the effectiveness of ISO 9001 implementation.

5. Conclusions

This study gives insights into ISO 9001 implementation level and barriers in implementation at an electricity sector company in Indonesia. The results show that the Implementation level of ISO 9001 is in the range of 4.00 – 5.00. Process approach, customer focus, evidence-based decision making, relationship management, leadership and improvement principle have near to good implementation level, while engagement of people has a slightly good implementation level. To improve the ISO 9001 implementation level, the company should take into account the barriers experienced while implementing it.

Five barriers experienced the most by electricity sector company in implementing ISO 9001 are: (1) perception that ISO 9001 is only the responsibility of quality management representatives; (2) lack of understanding of ISO 9001

quality management systems; (3) difficulties in interpreting ISO 9001 clauses; (4) Lack of understanding and awareness related to the benefits and importance of ISO 9001; and (5) lack of training or knowledge sharing regarding ISO 9001. All barriers are interrelated. Any action to overcome one barrier will affect other barriers and improve the ISO 9001 implementation level. Based on the barriers experienced, the company should focus on intensive ISO 9001 training that will help the enhancement of ISO 9001 value and improving the effectiveness of the implementation.

ISO 9001 implementation and certification are not the end, but the beginning of the process to achieve a sustainable success. The implementation of ISO 9001 is not enough to guarantee a company achieving the optimal benefits of ISO 9001 and meeting their goals. A leader should take accountability for the effectiveness of the quality management system by continuously assessing and reviewing the implementation level, identifying barriers experienced, and taking effective actions to overcome them.

This study has two limitations. First, not all PT ABC business units are ISO 9001 certified at the time of the study. Second, only one respondent per each business unit participated in the survey. Future research should consider increasing the target population when all of PT ABC business unit are ISO 9001 certified and increasing the number of respondents per business unit to better capture the implementation level and barriers in the business units. Future research can also be carried out to examine the motives in implementing ISO 9001 at electricity sector company.

Acknowledgments

We would like to thank all those who contributed to this study, especially to the respondents and quality management representatives who participated in the survey.

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Appendix A

Table A1. Factor analysis and reliability for ISO 9001 implementation level

	Factor loadings						
	CUST[a]	LEAD[b]	ENGP[c]	PROS[d]	IMPR[e]	DECS[f]	REAL[g]
CUST1	0.873						
CUST2	0.911						
CUST3	0.904						
CUST4	0.886						
LEAD1		0.910					
LEAD2		0.945					
LEAD3		0.932					
LEAD4		0.754					
ENGP1			0.922				
ENGP2			0.897				
ENGP3			0.889				
ENGP4			0.715				
PROS1				0.769			
PROS2				0.881			
PROS3				0.915			
PROS4				0.888			
IMPR1					0.837		
IMPR2					0.916		
IMPR3					0.723		
IMPR4					0.871		
DECS1						0.846	
DECS2						0.900	
DECS3						0.878	
DECS4						0.893	
REAL1							0.821
REAL2							0.911
REAL3							0.893
REAL4							0.883
REAL5							0.878
KMO	0.795	0.809	0.769	0.741	0.736	0.816	0.809
Bartlet's significance	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Eigenvalue	3.195	3.159	2.956	2.991	2.820	3.094	3.852
Cumulative variance (%)	79.881	78.969	73.895	74.786	73.976	77.346	77.032
Cronbach's alpha	0.914	0.910	0.875	0.881	0.844	0.901	0.924

[a]CUST : customer focus
[b]LEAD : leadership
[c]ENGP : engagement of people

[d]PROS : process approach
[e]IMPR : improvement
[f]DECS : evidence-based decision making
[g]REAL : relationship management

Table A2. Factor analysis and reliability for barriers in implementing ISO 9001

Barriers	Factor loadings		
	ORGB[a]	BEHB[b]	TECH[c]
ORGB1	0.863		
ORGB2	0.918		
ORGB3	0.892		
ORGB4	0.832		
ORGB5	0.793		
ORGB6	0.646		
BEHB1		0.718	
BEHB2		0.886	
BEHB3		0.908	
BEHB4		0.917	
BEHB5		0.850	
BEHB6		0.817	
TECH1			0.809
TECH2			0.837
TECH3			0.882
TECH4			0.902
TECH5			0.762
TECH6			0.870
KMO	0.842	0.836	0.877
Bartlet's significance	0.000	0.000	0.000
Eigenvalue	4.121	4.356	4.283
Cumulative variance (%)	68.675	72.600	71.378
Cronbach's alpha	0.904	0.922	0.918

[a]ORGB : organizational barriers
[b]BEHB : behavioral and cultural barriers
[c]TECH : technical barriers