



Readiness Analysis of ISO 9001: 2015 Quality Management System Implementation Using Gap Analysis Method

Khairul Anshar^{1✉}, Bakhtiar², Fara Anjelika³, Amri⁴, Fatimah⁵

^{1,2,3,4,5}Department of Industrial Engineering, Faculty of Engineering, Universitas Malikussaleh, Aceh, Indonesia

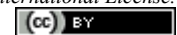
khairul.anshar@unimal.ac.id

Abstract

PT Pelindo Multi Terminal is a subsidiary of PT Pelabuhan Indonesia (Persero), which manages port services business in the field of multipurpose terminal operations in Indonesia. which was inaugurated on October 1st, 2021, resulting in a merger between PELINDO I, II, III, and IV. Until now, PT Pelindo Multi Terminal is still following PELINDO 1 regulations, one of which is the implementation of ISO 9001: 2008, which ISO 9001: 2008 has expired in September 2020. Therefore, PT Pelindo Multi Terminal must adjust the Quality Management System (QMS) to the latest version of the standard, namely QMS ISO 9001: 2015, and apply for ISO 9001: 2015 certification in order to maintain the quality of its service. The purpose of this study was to determine the readiness and constraints in implementing and obtaining ISO 9001: 2015 QMS certification. The method used in this research is Gap Analysis. Gap Analysis is a measurement method to determine the gap by mapping the current QMS and comparing it with the ISO 9001: 2015 QMS requirements, to obtain an analysis of the differences between the current QMS at PT Pelindo Multi Terminal and the ISO 9001: 2015 requirements. From the gap analysis results, PT Pelindo Multi Terminal has a readiness level of 88% to complete the ISO 9001:2015 QMS requirements and is ready to convert its QMS from ISO 9001:2008. However, based on the overall research results, there are still requirements, and some work procedures have not been carried out consistently. This is due to the lack of socialization and training on the implementation of ISO 9001:2015 after the merger, and the limited time and lack of human resources in checking internal audits to determine the suitability of SOPs that have been made.

Keywords: *Certification, Gap Analysis, ISO 9001:2015, Pelindo Multi Terminal, Quality Management System.*

JIDT is licensed under a Creative Commons 4.0 International License.



1. Introduction

The evolution of the industrial era requires every company to be able to face fierce competition from around the world. Therefore, companies compete with each other to maintain and improve their quality of the company. One of the efforts is the implementation of the ISO 9001: 2015 Quality Management System (QMS) [1], [2]. QMS ISO 9001 is an internationally applicable standard that contains requirements that must be met by a company if the company wants to prove that the company's management system is able to fulfill customer desires both in terms of service quality and processes in order to achieve customer satisfaction [1], [3]. With the introduction of QMS ISO 9001: 2015, it is expected to improve service quality to ensure customer satisfaction, meet market needs and indirectly improve the quality of human resource management (HR) in the company[1], [4].

PT Pelindo Multi Terminal is a subsidiary of state-owned company PT Pelabuhan Indonesia (Persero) which manages port services business in the field of multipurpose terminal operations in Indonesia, which was inaugurated on October 1, 2021 due to the merger between PELINDO I, II, III and IV. This merger was carried out under one name, PELINDO, as an effort by the government to standardize the performance of operational services and unify port management in Indonesia.

Currently, PT Pelindo Multi Terminal still follows PELINDO I regulations, one of which is the implementation of QMS ISO 9001: 2008. However, the validity period of ISO 9001:2008 has expired in September 2020. PT Pelindo Multi Terminal wants to maintain QMS ISO 9001 certification, so PT Pelindo Multi Terminal must adjust the QMS to the latest version of the standard, namely ISO 9001:2015 QMS and apply for QMS ISO 9001:2015 certification. Before applying for the certification process, PT Pelindo Multi Terminal must fulfill the stages in obtaining QMS ISO 9001 certification such as: conducting training, as well as understanding documentation, conducting internal quality audits and conducting management review meetings and reformulating regulations and standard procedures supporting documentation standardization of operational service performance such as SOP, IK and work monitoring forms which all of these stages are contained in the QMS ISO 9001: 2015 clause and must be implemented.

Based on observations and interviews that have been conducted, there are differences in the clauses of QMS ISO 9001: 2008 and the clauses of QMS ISO 9001: 2015. Therefore, the method used in this research is Gap Analysis. Gap Analysis is a measurement method to determine the gap by mapping the current QMS and

comparing it [5], [6]. Gap analysis is a measurement technique used to determine the difference (gap) between the presentation of a variable and consumer expectations of that variable [6], [7]. Gap analysis itself is part of the Importance-Performance Analysis (IPA). A gap analysis is effective because the checklist is structured and relevant to the topic. The checklist covers all existing requirements and is carried out hierarchically in the audit. It includes general questions and gives an overview of the topic or category to be assessed. Each question is linked to another question to ensure traceability [8]. The objectives to be achieved in this study are to determine the readiness and gap of QMS clauses between ISO 9001: 2008 and ISO 9001: 2015 at PT Pelindo Multi Terminal and to find out the obstacles of PT Pelindo Multi Terminal Head Office in implementing QMS ISO 9001: 2015.

Krudthong (2017) used gap analysis to identify quality in hotel services in Bangkok. Pratiwi & Winarni, (2019) used a combination of SWOT and gap analysis in order to develop products. Cahyaningsih et al., (2021) identified the priority of medicinal plants in Indonesia using the gap analysis method. Ahmadi et al., (2020) also used this method to guide management planning. Some use this method in the application or use of technology such as Fallah Haghighi et al., (2018), Mineraud et al., (2016) dan Valentin & Vijayan, (2020).

2. Research Methods

This research was conducted at the Head Office of PT Pelindo Multi Terminal located at Jalan Lingkar Pelabuhan No.1 Belawan, Medan City, North Sumatra Province, 20411. The research object is all staff of the Sisman and HSSE divisions at the Head Office of PT Pelindo Multi Terminal because they are considered to be very knowledgeable about the ISO Implementation plan at the Head Office of PT Pelindo Multi Terminal. The stages of the method carried out in this study can be seen in Figure 1 as follows.

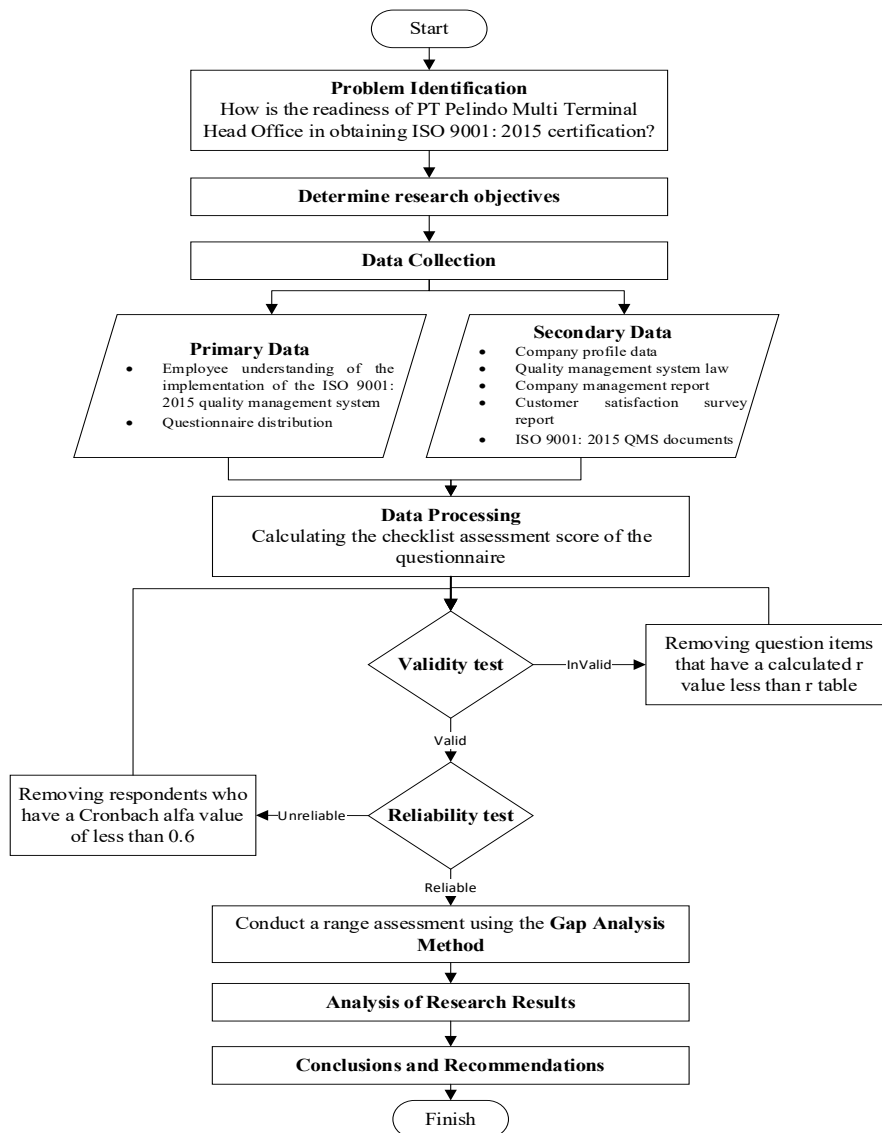


Figure 1. Research Flow Chart

Describe the preparation methods and characterization techniques used. Explain concisely but still accurately, such as size, volume, replication, and quality techniques. New methods must be detailed so other researchers can reproduce the experiment. Meanwhile, established methods can be explained by citing references.

3. Results and Discussion

3.1. Respondent Identity

Respondents are employees of PT Pelindo Multi Terminal in the Quality Management System & HSSE division. The identity of respondents in this study can be seen in table 1 as follows.

Table 1. Respondent Identity

No	Respondent Name	Gender	Position	Age (Years)	working time (Years)
1	Muhammad Haris	Male	VP HSSE	35	14
2	Orry Giovanni	Female	VP SPO Preparation	29	12
3	Jenny Hasibuan	Female	VP Management System	30	10
4	Rasmun Efendy Lubis	Male	SOP Preparation Staff	54	24
5	Arvyanti	Female	SOP Preparation Staff	27	7
6	Santoso	Male	HSSE Staf	37	12
7	Revy Effendy Emor	Male	HSSE Staf	39	13
8	Denny Prianto	Male	HSSE Staf	40	10
9	Indra Eka Putra	Male	Management System Staff	29	5

3.2. Assessment of Gap Analysis Checklists Calculation Results

The results of the gap analysis checklist for the implementation of QMS ISO 9001: 2015 at PT Pelindo Multi Terminal were carried out by distributing questionnaires to the SISMAN and HSSE divisions. The recapitulation of the gap analysis checklist score results for clauses 4 to 10 can be seen in table 2 as follows.

Table 2. Recapitulation of ISO 9001: 2015 Gap Analysis Checklist Score Results at PT Pelindo Multi Terminal

Clause	Respondent									Max Score
	R1	R2	R3	R4	R5	R6	R7	R8	R9	
4	45	44	45	40	45	40	39	43	44	45
5	30	27	29	26	26	26	26	27	28	30
6	35	35	35	26	28	23	30	24	23	35
7	73	77	76	67	70	72	69	70	71	80
8	105	100	100	98	100	97	99	94	94	120
9	33	33	35	29	35	25	32	32	34	40
10	29	30	30	28	30	24	29	29	30	30

3.3. Validity Test

The validity test serves to see whether a measuring instrument is valid or invalid. The questionnaire is valid, if the questions on the questionnaire can reveal what will be measured. The overall summary of the validity test can be seen in table 3 as follows.

Table 3. ISO 9001: 2015 Questionnaire Validity Test

No	Clause	r-count	r-table	Conclusion
1	Organizational Context	0,777	0,6664	Valid
2	Leadership	0,722	0,6664	Valid
3	Planning	0,874	0,6664	Valid
4	Support	0,689	0,6664	Valid
5	Operational	0,700	0,6664	Valid
6	Performance Evaluation	0,778	0,6664	Valid
7	Improvement	0,682	0,6664	Valid

3.4. Reliability Test

Reliability testing is carried out to see an index that shows the extent to which a measuring device can be trusted or relied upon. A reliable measurement tool is one that is able to produce the same results even if it is done many times at different times. The overall summary of the reliability test can be seen in table 4 as follows.

Table 4. Reliability Statistics

Cronbach's Alpha	N of items
0,839	7

The Cronbach's Alpha result for the 9001:2015 quality management system questionnaire shows a figure of 0.839 (> 0.60) so it can be concluded that the questionnaire is reliable and used as a data collection tool.

3.5. Analyze the readiness of ISO 9001: 2015 QMS Implementation using Gap Analysis

The results of the readiness of the implementation of ISO 9001: 2015 SMM are carried out by conducting a percentage assessment obtained from the summation of the assessment weight of the questionnaire or checklist score divided by the maximum score. The percentage assessment formula is as follows.

$$\text{Rating Percentage} = \frac{\text{Checklist Score}}{\text{Max Score}} \quad (1)$$

Table 5. Rating Percentage of ISO 9001:2015 QMS Implementation

Clause Number	Clause content	Max Score	Checklist Score	Rating Percentage
4	Organizational Context	405	385	95%
5	Leadership	270	249	92%
6	Planning	315	259	82%
7	Support	720	645	89%
8	Operational	1080	887	82%
9	Performance Evaluation	360	288	80%
10	Improvement	270	259	96%
Overall mean		3420	2972	88%

From the assessment results, it can be seen the level of implementation of ISO 9001: 2015 at PT Pelindo Multi Terminal based on the percentage range in table 6 below.

Table 6. Range of Readiness Assessment Percentages

Readiness Level	Description
100%	Implementation is very ready, because all requirements have been carried out properly and consistently.
91%-96%	Implementation is ready to be done, because all requirements are carried out well even though there are some that have not been done consistently.
76%-90%	Implementation is quite ready, but some requirements have been carried out but are still not consistent.
51%-75%	Implementation is not ready, because there are still some requirements that have not been carried out, but there are some requirements that are carried out even though they are not written.
0%-50%	Implementation is not ready to be done, because implementation is not carried out in accordance with written requirements.

From the percentage calculation that has been done, it can be seen that the assessment range is in the range of 80%-96% with an average readiness result of 88%. This shows that the Quality Management System of PT Pelindo Multi Terminal is ready to complete the requirements of QMS ISO 9001: 2015 and ready to convert the Quality Management System from ISO 9001: 2008. However, based on the overall research results there are still requirements and some work procedures have not been carried out consistently.

3.6. Constraints in implementing ISO 9001:2015 based on ISO 9001:2015 Quality Management System requirements

The obstacles in implementing, based on the requirements of each clause must be met QMS ISO 9001: 2015 are as follows.

1. **Clause 4 - Organizational Context**
PT Pelindo Multi Terminal has fulfilled 95% of the requirements of clause 4 Organizational Context in the QMS ISO 9001: 2015. This shows that the requirements in this clause have been implemented but are still not fully consistent in their application. This discrepancy occurs because human resources or employees lack understanding of business processes and the needs of interested parties.
2. **Clause 5 – Leadership**
PT Pelindo Multi Terminal has fulfilled 92% of the leadership requirements in the ISO 9001: 2015 Quality Management System. Clause 5 shows that the implementation has been done well, but there are still discrepancies. This discrepancy is because the application still takes time to be said to run consistently. Top management has maximized its function as a leader so that it is expected that the implementation of the quality management system can run consistently. This is evidenced by the division of tasks in all sections to be able to meet the quality objectives set by the company, although the division still causes duplicate work. But the division of tasks is divided quite well because this division is carried out to employees who are considered sufficient to master the task.
3. **Clause 6 - Planning**
PT Pelindo Multi Terminal has fulfilled 82% of the requirements of the ISO 9001:2015 Quality Management System. For the implementation of overcoming this risk to run consistently and as expected, the company needs to hold a broader socialization to employees about changes to the ISO 9001: 2015 Quality Management System clause and what is the importance of understanding procedures based on the clause, not only when the audit will be carried out just studying the clause but in its daily application also each individual is required to understand that every procedure made is a derivative of the existing clause. In addition, there needs to be supervision by company representatives in each unit. This needs to be done

considering the implementation period that has just been running so that the company is better prepared to carry out changes in the transition of the quality management system from ISO 9001: 2008 to ISO 9001: 2015.

4. **Clause 7 - Supporting**

PT Pelindo Multi Terminal has fulfilled 89% of the requirements of clause 7 Supporting the ISO 9001: 2015 Quality Management System. Clause 7 shows that some requirements have been carried out well, but in its application, there are still discrepancies. This is because training has not been carried out by existing requirements, and the company does not carry out this training because the company considers that the current human resources are still considered adequate. After all, existing employees have been able to perform existing tasks well, which happens because the current human resources have been working for a long time and are accustomed to the existing work. Training will be carried out after recruitment, because new employees certainly still need to be trained so that they can work up to company expectations.

5. **Clause 8 - Operations**

PT Pelindo Multi Terminal has fulfilled 82%. Clause 8 shows that the implementation has been done well. The obstacle that causes this clause not to run optimally is the lack of human resources in the SISMAN & HSSE division to check internal quality audits to see and find out whether the SOPs that have been made are implemented or not, and there are several requirements that are still in the consistent implementation stage.

6. **Clause 9 - Performance Evaluation**

PT Pelindo Multi Terminal has met 80% of the requirements of clause 9 Performance Evaluation in the ISO 9001: 2015 Quality Management System, but still needs to improve several things related to evaluation. The main obstacle found in this clause is the lack of human resources who carry out the requirements, causing some requirements to not be fulfilled, such as audit results and follow-up meetings. This happens because existing employees have to find time to check when work is not busy, causing the work to often not be done.

7. **Clause 10 - Improvement**

PT Pelindo Multi Terminal has fulfilled 96% with high percentage results indicating that almost all procedures are carried out properly, but there are things and obstacles that occur in the implementation of improvements, because there are several requirements that are still in the stage of consistent implementation. Therefore, to fix these obstacles, PT Pelindo Multi Terminal is committed to continuously improving the suitability, adequacy, and effectiveness of the Quality Management System on an ongoing basis by considering the results of analysis, evaluation, and management review outputs to determine needs or opportunities that should be addressed as part of continuous improvement.

3. Conclusion

Based on the gap analysis conducted regarding the gap between the implementation of the ISO 9001: 2008 quality management system to the implementation of the ISO 9001: 2015 quality management system, the overall score is 88%. This shows that PT Pelindo Multi Terminal has met the requirements of the ISO 9001: 2015 Quality Management System and is ready to convert the system. However, overall, there are still some requirements that have not been carried out perfectly and have not been implemented consistently. The obstacle faced by the Head Office of PT Pelindo Multi Terminal in implementing QMS ISO 9001: 2015 is that the company has not provided more in-depth training and socialization related to the implementation of ISO 9001: 2015 after the merger, so that employees do not understand and are inconsistent in doing their work. This is also due to time constraints and a lack of human resources.

References

- [1] F. Ong *et al.*, "Does Quality Management System ISO 9001:2015 Influence Company Performance? Answers from Indonesian Tourism Industries Quality Management Strategies View project HR Management View project Does Quality Management System ISO 9001:2015 Influence Company Per," *TEST:Engineering &Management*, vol. 83, no. July, pp. 24808– 24817, 2020, [Online]. Available: <https://www.researchgate.net/publication/342975441>.
- [2] I. Betlloch-Mas, R. Ramón-Sapena, C. Abellán-García, and J. C. Pascual-Ramírez, "Implementation and Operation of an Integrated Quality Management System in Accordance With ISO 9001:2015 in a Dermatology Department," *Actas Dermo-Sifiliográficas (English Ed.)*, vol. 110, no. 2, pp. 92–101, 2019, doi: 10.1016/j.adengl.2019.01.003.
- [3] L. S. Sfreddo, G. B. B. Vieira, G. Vidor, and C. H. S. Santos, "ISO 9001 based quality management systems and organisational performance: a systematic literature review," *Total Qual. Manag. Bus. Excell.*, vol. 29, no. 34, pp. 1–21, 2021, doi: 10.1080/14783363.2018.1549939.
- [4] F. Franceschini, M. Galetto, and L. Mastrogiamomo, "ISO 9001 certification and failure risk: any relationship?," *Total Qual. Manag. Bus. Excell.*, vol. 29, no. 11–12, pp. 1279–1293, 2018, doi: 10.1080/14783363.2016.1253466.
- [5] N. Fallah Haghighi, H. Hajihoseini, G. Ramezanpour Nargesi, and M. Bijani, "Gap analysis of current and desired states of entrepreneurship development components in the field of ICTs in Iran," *Technol. Soc.*, vol. 54, no. March, pp. 101–110, 2018, doi: 10.1016/j.techsoc.2018.03.003.
- [6] A. W. Calhoun, E. A. Rider, E. Peterson, and E. C. Meyer, "Multi-rater feedback with gap analysis: An innovative

- means to assess communication skill and self-insight,” *Patient Educ. Couns.*, vol. 80, no. 3, pp. 321–326, 2010, doi: 10.1016/j.pec.2010.06.027.
- [7] S. Pratiwi and B. Winarni, “SWOT and Gap Analysis for New Product Development at PT. Duta Karya Mandiri,” *Int. J. Bus. Manag. Res.*, vol. 9, no. 1, pp. 7–12, 2019, doi: 10.24247/ijbmrfeb20192.
- [8] M. Picard, A. Renault, B. Barafort, and S. Cortina, “Measuring readiness for compliance: A gap analysis tool to complete the TIPA process assessment framework,” in *Communications in Computer and Information Science*, 2016, vol. 633, pp. 106–116, doi: 10.1007/978-3-319-44817-6_9.
- [9] S. Krudthong, “A Service Quality Gap Analysis: A Case Study of a Small-Sized Hotel in Bangkok, Thailand,” *Int. J. Manag. Appl. Sci.*, no. 3, pp. 2394–7926, 2017, [Online]. Available: <http://iraj>.
- [10] R. Cahyaningsih, J. Magos, and N. Maxted, “Gap analysis of Indonesian priority medicinal plant species as part of their conservation planning,” *Glob. Ecol. Conserv.*, vol. 26, pp. 1–11, 2021, doi: 10.1016/j.gecco.2021.e01459.
- [11] M. Ahmadi, M. S. Farhadinia, S. A. Cushman, and D. W. Macdonald, “Species and space : a combined gap analysis to guide management planning of conservation areas,” *Landsc. Ecol.*, vol. 5, pp. 1–13, 2020, doi: 10.1007/s10980-020-01033-5.
- [12] E. Valentin and V. Vijayan, “Biosecurity risk mapping and gap analysis in South East Asia,” *J. Biosaf. Biosecurity*, vol. 2, no. 1, pp. 36–43, 2020, doi: 10.1016/j.jobb.2020.03.001.
- [13] J. Mineraud, O. Mazhelis, X. Su, and S. Tarkoma, “A gap analysis of Internet-of-Things platforms,” *Comput. Commun.*, 2016, doi: 10.1016/j.comcom.2016.03.015.