http://jurnal.yudharta.ac.id/v2/index.php/jkie

Journal Knowledge Industrial Engineering

E-ISSN: 2541-4461 | P-ISSN: 2460-0113

Analysis of Renewall Readiness for Quality Management System Certification Based on ISO 9001:2015 Using Gap Analysis

Uni Pratama Pebrina Tarigan[a], Dameria Rajagukguk[b]

[a,b] Department of Industrial Engineering, Universitas Prima Indonesia

Corresponding Autor: unipratama@gmail.com

Article Info

Article history

Received : January25, 2023

Resived : March 27, 2023

Accepted : April 03, 2023

Published : April 30, 2023

Keywords:

Quality Management System;
ISO 9001:2015;
Gap Analysis;
Renewall Readiness.

A B S T R A C T

PT PI is a company engaged in Port Services. PI still follows the company's regulations that are still set to date, namely the implementation of the Quality Management System 9001:2008, but the Quality Management System has ended in 2020. Therefore, PT PI must adjust the Quality Management System to the latest standards of Quality Management System ISO 9001: 2015 in order to maintain the quality of Service Quality in the company. The purpose of this study is to determine the readiness in the implementation of Quality Management System ISO 9001:2015 in obtaining certification. The method used in this study is Gap Analysis. Gap Analysis is a measurement method to determine the gap (Gap) by mapping the current Quality Management System and comparing it with the requirements of the ISO 9001:2015 Quality Management System, so that the analysis of differences from the Quality Management System at PI is now with the requirements of the ISO 9001:2015 Quality Management System to be determined.

DOI: https://doi.org/10.35891/jkie. v10i1.4056

1. Introduction

Quality Management System is a system used to establish policies or official statements by top management related to the attention and direction of the organization in the field of quality and quality objectives (everything related to quality and targeted (target) achievement by setting the size or criteria of achievement. Quality management is an activity of the entire management function that sets the quality policy, objectives and responsibilities of the company, and implement it in ways such as quality planning, Quality Control, Quality Assurance and quality improvement in the quality system (Prihantoro, 2012).

ISO (International Organization for Standardization) is the largest international standards development organization in the world. Published international standards provide requirements for more effective and efficient management systems and products/services that will ultimately improve organizational performance. ISO 9001: 2015 is a family of quality management standard systems designed to assist organizations in ensuring that they can meet the needs of their customers and stakeholders and can meet the requirements of legislation, laws and regulations related to their products or services. In addition, the implementation of ISO 9001: 2015 Quality Management System can also ensure the consistency of the quality of products and services produced in accordance with the requirements of the company or customer and prevent product or service quality failures throughout the production process.

Gap Analysis is defined by the IT Infrastructure Library (ITIL) as an activity that compares two types of data and identifies differences. Gap analysis is used to compare a set of requirements. Gap analysis is generally structured on a set of areas, topics or categories, thus making gap analysis efficient to find out which sectors or areas need improvement. Therefore, the implementation of the Quality Management System is carried out to ensure that all parts of the organization and the company to cooperate. The change in Quality Management System certification aims to improve processes, service quality, products, and corporate culture in order to obtain long-term success.

2. Literature Review

In general, a system is a collection of objects or elements or parts that have different meanings that have relationships, cooperate and influence each other and have relationships, cooperate and influence each other and have attachments to the same plan or plane in achieving a certain goal in the environment. System is collection or set of elements, components, or variabels that are organized, interact, depend on each other and are integrated (Sutabri, 2012). Understanding of the system is a set objects, which includes the reletionship between the objects, as well as the relationship between the properties they have (R.Fagen and A.Hall).

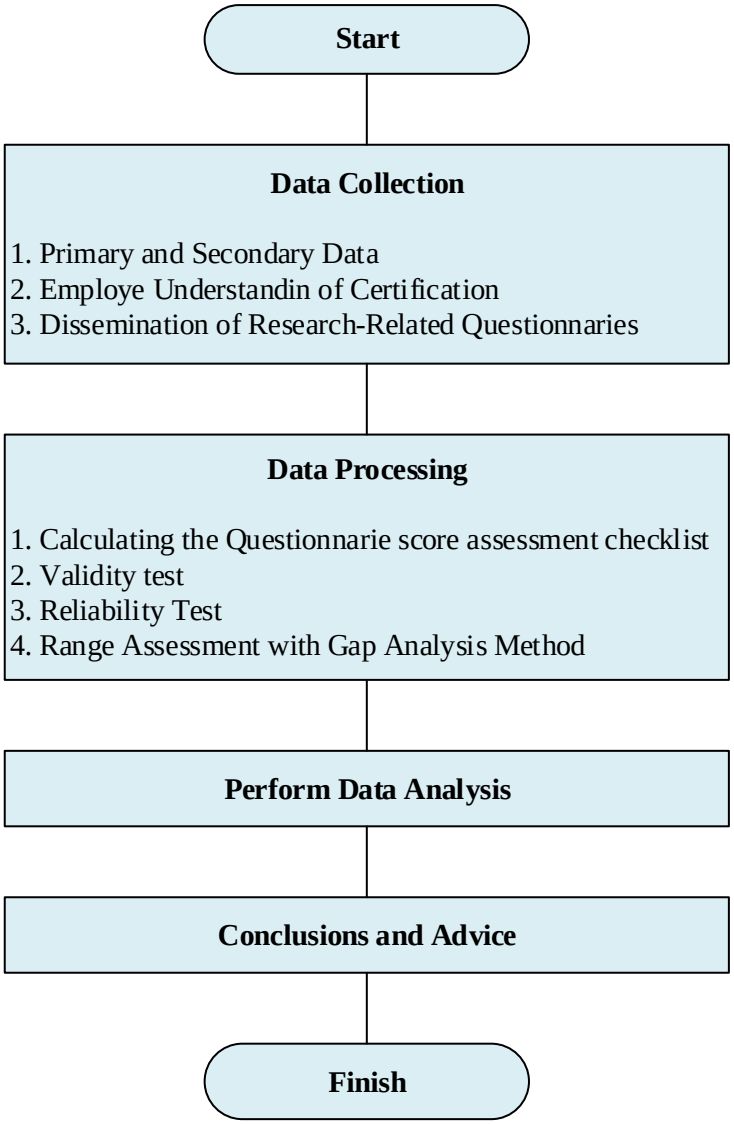
A system is a unit consisting of components or elements that interact, interrelate, or depend on each other to from a complex whole. Mc Leod suggested that the system is a group of elements that are integrated with the sama intention to achieve a global (Ladjamudin, 2005). Based on some of the above theories about the system that has been described, it can be concluded that the system is a unity consistting of elements that interact with each other and integration to achieve a specific goal. Management is the process of organizing, regulating, managing human resources, to control in order to achieve the goals of an activity. Management is indispensable for personal as well as business needs. Management is the process of working together between individuals and groups and other resources in achieving organizational goals. According to W Edward Deming, Quality company is a company that controls market share because its production is in accordance with consumer needs, resulting in satisfaction for consumers. If consumers are satisfied, then they will be loyal in buying the company's products in the form of goods and services.

Quality management system is a system used to establish policies or official statements by top management related to the attention and direction of the organization in the field of quality and quality objectives (everything related to quality and targeted) achievement by setting the size or criteria of achievement. Quality management is an activity of the enteri management function that sets the quality policy, objectives and responsibilities of the company, and implement it in ways such as quality planning, quality control, quality assurance and quality improvement in the quality system (Prihantoro, 2012), quality managament is an organizational philosophy and culture that emphasizes the efforts to create constant quality through every aspect of organizatonal activities.

Table 1. Comparison of ISO 9001: 2008 with ISO 9001: 2015

ISO 9001:2008	ISO 9001:2015
Scope	Scope
Normative Reference	Normative Reference
Terms and Definitions	Terms and Definitions
Quality Management System	Organizational Context
Management Responsibilities	LeaderShip
Resource Management	Planning
Product Realization	Supporters
Measurement	Operations
Analysis	Performance Evaluation
Repair	Repair

3. Methodology



Picture 1. Research flow chart

4. Results and Discussion

4.1. Research Result

a. Identity of Respondents

The following is the identity of respondent which contains the full nama, Position, Age, Gender, and length of time worked:

Table 2. Respondent Identity

No	Respondent Name	Gender (Male/Female)	Departement	Age (Year)	Long Time Working (Year)
1	Mr. Muhammad Zulfan	M	SVP Engineering	53	24
2	Mrs. Susi Nariani	F	VP	51	22
3	Mr.Fithra Kurniawan	M	Staff	31	9
4	Mrs.Yuni Yuniarty	F	Staff	32	9
5	Mrs.Veroyanta Tarigan	M	Staff	34	9
6	Mr.Muhammad faizal	M	Staff	30	6
7	Mr.Rizky Rizaldi	M	Staff	35	9

8	Mr.Heru Kustanto	M	VP	37	9
9	Mr.Indris	M	VP	48	17
10	Mr.Sidiq	M	VP	45	16
11	Mr.Faisal	M	Staff	32	9
12	Mr.Galuh	M	Staff	33	9
13	Mr.Deni	M	Staff	30	8
14	Mr.Ade	M	Staff	29	7
15	Mr.Jacob	M	Staff	30	7
16	Mr.Kontinu	M	Staff	31	7
17	Mrs.Viona	F	Staff	34	7
18	Mrs.Santika	F	Staff	30	7
19	Mrs.Dewi	F	Staff	50	18
20	Mr.Fahmi	M	Staff	30	9
21	Mr.Jalaluddin	M	Staff	50	19
22	Mr.Risky	M	Staff	33	9
23	Mr.Saipul	M	Staff	36	12
24	Mr.Zico	M	Staff	33	9
25	Mr.Salman	M	VP	47	15
26	Mr.Randa	M	Staff	33	9
27	Mr.Fajar	M	Staff	32	9
28	Mr.Rizal	M	Staff	34	9
29	Mr.Iskandar	M	Staff	35	9
30	Mrs.Vinny	F	Staff	30	6

b. Assessment Results Gap Analysis Checklist Analysis

The results of the implementation of the Gap Analysis checklist were carried out by distributing questionnaires to the Engineering Division. the following results of the Gap Analysis checklist score for clauses 4 to 10 are as follows:

Table 3. Recapitulation of the results of the score Gap Analysis Checklist SMM ISO 9001:2015

Respondent	**Clause**						
	K4	**K5**	**K6**	**K7**	**K8**	**K9**	**K10**
R1	35	25	28	60	105	35	21
R2	43	27	33	73	105	38	30
R3	43	29	33	77	118	39	27
R4	35	20	33	60	106	35	25
R5	45	27	32	70	110	38	29
R6	44	27	32	72	102	35	28
R7	45	26	29	76	107	38	25
R8	24	20	31	70	108	36	29
R9	44	29	34	77	116	38	29
R10	43	28	33	75	110	39	25
R11	43	25	33	70	115	38	27
R12	43	29	24	77	104	39	29
R13	42	28	33	69	115	39	28
R14	45	29	32	73	105	38	30
R15	35	28	32	70	107	35	25

R16	45	29	29	76	107	39	30
R17	42	25	31	70	105	36	29
R18	44	29	34	77	112	38	30
R19	44	29	34	77	102	38	28
R20	43	28	33	75	106	39	28
R21	43	25	33	73	105	40	27
R22	43	29	33	77	104	39	26
R23	42	29	33	69	106	38	28
R24	45	29	32	70	105	38	27
R25	44	28	32	72	106	40	29
R26	30	29	23	60	107	38	28
R27	42	28	31	70	104	36	27
R28	44	29	34	77	106	40	27
R29	43	29	32	74	105	39	28
R30	43	25	32	74	106	40	27
Maximum Score (Individual)	**45**	**30**	**35**	**80**	**120**	**40**	**30**

c. Validity and reliability test

Validity testing on all questionnaire results was conducted using SPPS Software. With the number of respondents 30 people, then df =30 – 2 = 28; α = 5%, then equal to 0.3610. criteria of a data can be invalidated valid if ($r_{hitung} \geq r_{tabel}$). Summarizes the overall data as follows:

Table 4. Data Processing

No	Clause	R_{Count}	R_{table}	Conclusion
1	Organizational Context	0,8070	0,3610	Valid
2	Leadership	0,6162	0,3610	Valid
3	Planning	0,5123	0,3610	Valid
4	Supporters	0,8414	0,3610	Valid
5	Operational	0,4079	0,3610	Valid
6	Performance Evaluation	0,6675	0,3610	Valid
7	Repair	0,4705	0,3610	Valid

Measuring instruments are called reliable, if they produce the same results even though measurements are taken many times at different times. reliability test is performed using SPSS software. data can be said to be reliable if the value of Cronbach's Alpha > 0.60. the summary results of the overall reliability test processing are as follows.

Case Processing Summary

		N	%
Cases	Valid	30	100,0
	Excluded[a]	0	,0
	Total	30	100,0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
,706	7

Picture 2. Process data using SPSS

Cronbach's alpha results for Quality Management System questionnaire 9001: 2015 showed 0.706 where > 0.600. it can be concluded that it is reliable enough to be used as a data retrieval tool.

d. Analysis of ISO 9001:2015 SMM Implementation readiness using Gap Analysis

The results of SMM ISO 9001: 2015 implementation readiness is done by doing the percentage assessment obtained from the summation of the assessment weights of questionnaires or checklist scores divided by the maximum score divided by 100%. adapaun percentage formula is as follows:

$$Rating\ Percentage = \frac{\text{Score Cheklist}}{\text{Score Maximal}} 100\%$$

percentage table of ISO 9001:2015 SMM implementation.

Table 5. Data Processing

Clause	Clause Content	Maximum Score	Score Checklist	Percentage Assessment
1	Organizational Contaxt	1350	1254	93%
2	Leadership	900	817	91%
3	Planning	1050	948	90%
4	Supporters	2400	2160	90%
5	Operations	3600	3219	89%
6	Performance Evaluation	1200	1138	95%
7	Repair	900	829	92%
Overall Average		11400	10365	91%

Table 6. Percentage range readiness assessment

Percentage Readiness	Explanation
100%	Implementation has been fully carried out, because all requirements have been run consistenly.
91% - 96%	Has been executed well, but there are some that have not been implemented consistenly.
76% - 90%	Implementation is quite ready to do, but some requirements are carried out but not consistent.

51% - 75%	Requirements that have not been executed, but there are some requirements run even though it's not written.
0% - 50%	Implementation is not executed properly, and not implemented in accordance with requirements.

4.2. Discussion

a. Gap analysis Clause 4 organizational context

Clause 4 organizational context is one of the distinguishing clauses between ISO 9001:2015 Quality Management System . Clause 4 the organizational context is divided into four sub clauses. the assessment results can be seen in the table below:

Table 7. Results of data processing Clause 4

No	Sub Clause	Value (%)
1	4.1 Understanding the organization and organizational context	93
2	4.2 understand the needs and expectations of interested parties	92
3	4.3 determining the scope of SMM	94
4	4.4 Quality Management System and its processes	93
	Readiness value	**93**

b. Gap Analysis Clause 5 Leadership

Clause 5 of the leadership discusses the duties and responsibilities and authority of top management in implementing the quality management system. Clause 5 leadership is divided into three sub clauses. The assessment results for each sub clause can be seen in Table as follows:

Table 8. Results of data processing Clause 5

No	Sub Clause	Value (%)
1	5.1 leadership and commitment	92
2	5.2 Policy	92
3	5.3 roles, responsibilities and authority of the organization	89
	Readiness Value	**91**

c. Gap Analysis clause 6 Planning

Clause 6 of the plan discusses the implementation of risk-based thinking, quality objectives and planning changes in the process. Clause 6 has three sub clauses. The assessment results for each sub clause can be seen in Table as follows:

Table 9. Results of data processing Clause 6

No	Sub Klausul	Value(%)
1	6.1 actions to address risks and opportunities	89
2	6.2 Quality Objectives and planning to achieve goals	91
3	6.3 Change Planning	91
	Readiness Value	**90**

d. Gap Analysisi clause 7 Supporters

Supporting Clause 7 requires that companies establish the resources and supporting components needed in business processes and retain documented information that is a

requirement of ISO 9001:2015. The supporting Clause 7 is divided into five sub clauses. The assessment results for each sub clause can be seen in Table as follows:

Table 10. Results of data processing Clause 7

No	Sub Clause	Value(%)
1	7.1 Resources	89
2	7.2 Competence	89
3	7.3 Awarences and Care	89
4	7.4 Communication	94
5	7.5 Documented Information	91
	Readiness Value	**91**

e. Gap Analysis Clause 8 Operations

Clause 8 of operations contains requirements regarding the operating activities or business processes of an enterprise. Clause 8 has seven sub clauses. The assessment results for each sub clause can be seen in Table as follows:

Table 11. Results of data processing Clause 8

No	Sub Clause	Value(%)
1	8.1 Operational Planning and control	90
2	8.2 Requirements for products and services	90
3	8.3 Design and development of products and services	86
4	8.4 Control of the provision of external products and services	93
5	8.5 Implementation of processes or provision of products and Services	90
6	8.6 Release of products and services	88
7	8.7 Inappropriate Output control	87
	Readiness Value	**89**

f. Gap Analysis Clause 9 Performance Evaluation

The performance evaluation clause requires that the company carry out monitoring and measurement of the quality management system and carry out internal audits and management reviews. Clause 9 Performance Evaluation is divided into three sub clauses. The assessment results for each sub clause can be seen in Table as follows:

Table 12. Results of data processing Clause 9

No	Sub Clause	Value(%)
1	9.1 Monitoring, measurement, analysis and Evaluation	95
2	9.2 Internal Audit	95
3	9.3 Manajemen Review	94
	Readiness Value	**95**

g. Gap Analysis Clause 10 Repair

Clause 10 improvement contains requirements that require the company to make improvements to nonconformities and make long-term business development planning as an effort to improve the quality management system. Clause 10 of the remedy has three sub clauses. The assessment results for each sub clause can be seen in Table as follows:

Table 13. Results of data processing Clause 10

No	Sub Clause	Value(%)
1	10.1 Nonconformities and remedial measures	91
2	10.2 Continuous Improvement	92
3	10.3 Effectiveness of SMM	93
	Readiness Value	**92**

5. Conclusion

From the results of Gap Analysis conducted on the application of Quality Management System ISO 9001: 2015 obtained an overall score with an average of 91% (can be seen in Table 5). This shows that PT PI has met the renewal requirements of ISO 9001:2015 Quality Management System Certification and is ready to implement the company to improve service quality.

References

Putra, R. R. (2016). Perancangan Aplikasi Berbasis Komputer untuk Proses Manajemen Mutu pada Pembangunan Kapal Baru. *Jurnal Teknik ITS (SINTA: 4, IF: 1.1815)*, *5*(2), G129-G135.

Scott, J. M., Davis, F., Csuti, B., Noss, R., Butterfield, B., Groves, C., ... & Wright, R. G. (1993). Gap analysis: a geographic approach to protection of biological diversity. *Wildlife monographs*, 3-41.

Van Ittersum, M. K., Cassman, K. G., Grassini, P., Wolf, J., Tittonell, P., & Hochman, Z. (2013). Yield gap analysis with local to global relevance—a review. *Field Crops Research*, *143*, 4-17.

Syukri, S. H. A. (2014). Penerapan Customer Satisfaction Index (CSI) dan analisis gap pada kualitas pelayanan Trans Jogja.

Basyarahil, F. A., Astuti, H. M., & Hidayanto, B. C. (2017). Evaluasi Manajemen Keamanan Informasi Menggunakan Indeks Keamanan Informasi (KAMI) Berdasarkan ISO/IEC 27001: 2013 pada Direktorat Pengembangan Teknologi dan Sistem Informasi (DPTSI) ITS Surabaya. *Jurnal Teknik ITS*, *6*(1), 116-121.

Hussein, B., Abou-Nassif, S., Aridi, M., Chamas, M., & Khachfe, H. (2017). Challenges and prospects of implementing ISO 9001: 2015 in Lebanese higher education institutions. *Journal of Resources Development and Management*, *33*(1), 41-51.

Purushothama, B. (Ed.). (2014). Implementing ISO 9001: 2015.

Fahmi, K., Mustofa, A., Rochmad, I., Sulastri, E., Wahyuni, I. S., & Irwansyah, I. (2021). Effect of ISO 9001: 2015, ISO 14001: 2015 and ISO 45001: 2018 on operational performance of automotive industries. *Journal of Industrial Engineering & Management Research*, *2*(1), 13-25.

Jennings, M. D. (2000). Gap analysis: concepts, methods, and recent results. *Landscape ecology*, *15*, 5-20.

Fonseca, L., & Domingues, J. P. (2017). ISO 9001: 2015 edition-management, quality and value. *International journal of quality research*, *1*(11), 149-158.

Fonseca, L. (2015). From Quality Gurus and TQM to ISO 9001: 2015: a review of several quality paths. *International Journal for Quality Research (IJQR)*, *9*(1), 167-180.

Supriyanto, A. (2011). Implementasi total quality management dalam sistem manajemen mutu pembelajaran di institusi pendidikan. *Jurnal Cakrawala Pendidikan*, *1*(1).

Witara, K. (2018). Cara singkat memahami sistem manajemen mutu iso 9001: 2015 dan implementasinya.

Prabowo, S. L. (2009). Implementasi sistem manajemen mutu ISO 9001: 2008 di perguruan tinggi (guidelines IWA-2).

Purushothama, B. (Ed.). (2014). Implementing ISO 9001: 2015.

Purwanggono, B., Bakhtiar, A., & Rahman, R. (2018). Analysis of ISO 9001: 2015 certification readiness of JP-Graha product of Jasaraharja Putera using gap analysis. In *SHS Web of Conferences* (Vol. 49, p. 01005). EDP Sciences.

Bouchetara, M., Amrani, A. F. Z., & Bedaida, I. E. (2022). The Implementation of a Quality Management System in Accordance with ISO 9001: 2015 Standard: A Case Study. *International Journal of Economics & Business Administration (IJEBA)*, *10*(1), 261-286.

Ruswanto, T. P., & Saroso, D. S. (2018). Gap analysis study on the compliance of automotive standard IATF 16949 based on internal quality audit score in automotive industry. *Journal of Applied Research on Industrial Engineering*, *5*(4), 271-285.

Nurcahyo, R., Arsena, M., & Habiburrahman, M. (2019, January). Designing quality assurance system using gap analysis method on automotive spare parts company (Case study of PT. TPI). In *Proceedings of the International Conference on Industrial Engineering and Operations Management* (No. November, pp. 139-145).

Hadidi, L., Assaf, S., Aluwfi, K., & Akrawi, H. (2017). The effect of ISO 9001 implementation on the customer satisfaction of the engineering design services. *International Journal of Building Pathology and Adaptation*, *35*(2), 176-190.

Bambang Purwanggono, B., & Arfan Bakhtiar, A. Hasil Turnitin di prosiding International Cooperation for Education about Standardization 2018 (ICES 2018) Conference Joint International Conference with 5th ACISE (Annual Conference on Industrial and System Engineering) and World Standard Cooperation Academic Day dengan judul" Analysis of ISO 9001: 2015 certification readiness of JP-Graha product of Jasaraharja Putera using gap analysis".

Firdaus, E., Trisnamansyah, S., Warta, W., & Tejawiani, I. (2022). ISO 9001: 2015 Quality Management System Implementation To Improve the Performance of Vocational High Schools in Sumedang Regency, West Java Province. *International Journal of Educational Research and Social Sciences (IJERSC)*, *3*(2), 702-713.

Mohammadi, M. M., Jalali, A., & Hasani, A. (2021). Success and failure factors in implementing quality management systems in small-and medium-sized enterprises: a mixed-method study. *International Journal of Quality & Reliability Management*, *39*(2), 468-494.

Purwanto, A., Asbari, M., Novitasari, D., Cahyono, Y., Wardana, W., Suryani, P., ... & Wahyuni, I. S. (2021). Peningkatan Kualitas Produk dengan Pelatihan ISO 9001: 2015 Sistem Manajemen Mutu Pada Industri Packaging di Tangerang. *Journal of Community Service and Engagement*, *1*(02), 28-34.

Purwanto, A., Asbari, M., Novitasari, D., Cahyono, Y., Wardana, W., Suryani, P., ... & Wahyuni, I. S. (2021). Peningkatan Kualitas Produk dengan Pelatihan ISO 9001: 2015 Sistem Manajemen Mutu Pada Industri Packaging di Tangerang. *Journal of Community Service and Engagement*, *1*(02), 28-34.

Legowo, M. B., & Indiarto, B. (2017). Model Sistem Penjaminan Mutu Berbasis Integrasi Standar Akreditasi BAN-PT dan ISO 9001: 2008. *Jurnal RESTI (Rekayasa Sistem Dan Teknologi Informasi)*, *1*(2), 90-98.

Nazmia, I., Silalahi, E., & Asbari, M. (2023). Implementation Analysis of ISO 9001: 2015 in the Food Industry: A Narrative Literature Review. *Journal of Information Systems and Management (JISMA)*, *2*(3), 25-33.

Hutabarat, F. M., & Manuputty, A. D. (2020). Analisis Resiko Teknologi Informasi Aplikasi VCare PT Visionet Data Internasional Menggunakan ISO 31000. *Jurnal Bina Komputer*, *2*(1), 52-65.

Yarnold, J., Banihashemi, S., Lemckert, C., & Golizadeh, H. (2021). Building and construction quality: systematic literature review, thematic and gap analysis. *International Journal of Building Pathology and Adaptation*.

Syukri, S. H. A. (2014). Penerapan Customer Satisfaction Index (CSI) dan analisis gap pada kualitas pelayanan Trans Jogja.

Endra, R. Y., & Prasetya, D. (2017). Analisis Perbandingan Teknik SEO Antara Google Webmaster Dan Bing Master Menggunakan Gap Analisis. *Explore: Jurnal Sistem Informasi dan Telematika (Telekomunikasi, Multimedia dan Informatika)*, *8*(1).