Evaluation of Integrated Management System (Quality Management System, Environmental Management System, Occupational Health and Management System) at The Implementasion Stage of Risks Based Construction To Improve Project Time

Fardian Muchyar[1], Leni Sagita[2], Yusuf Latief[3]
[1,2,3](Civil Engineering Department, University of Indonesia, Indonesia)

ABSTRACT : *Delays in construction activities, the occurrence of nonconformities, safety incidents, and complaints concerning environmental impacts frequently develop over time and ultimately disrupt planned project schedules. Such issues rarely arise from a single source but more often reflect a chain of decisions fragmented coordination, and management controls that operate in isolation. PT. XYZ, a major contractor in Indonesia, has adopted an Integrated Management System encompassing ISO 9001:2015, ISO 14001:2015. and 1S0 45001:2018; however, its implementation during the construction phase has not been evaluated from a risk-based perspective aligned with the High Level Structure. This study investigates the extent to which the integrated system is operationalized on-site, examines how clause objectives are translated into daly practices and id entifies risk events that most strongly affect project schedule performance Data were collected through expert validation, instrument testing, and a survey involving respondents with diverse educational, professional, and experiential backgrounds. Statistical analysis combined with frequency-impact assessment was used to evaluate the findings, The study identifles the highest-priority risk factors associated with clause objectives during construction and outines strategles for managing these critical risks.*

KEYWORDS – *Construction, Integrated Management System, Project Management, Project Time, Risk*

I. INTRODUCTION

1.1. Background

The construction industry is very important for the expansion of both the global and national economies. However, the inherent complexity of construction projects often leads to problems that never go away, such as delays in the schedule, quality issues, safety mishaps, and environmental concerns. Previous research suggests that these problems seldom arise from a singular cause. Instead, they come from a lot of bad decisions, too many design revisions, not enough skilled workers, bad building procedures, and poor coordination between everyone working on the project. At the same time, the rising frequency of workplace accidents and the growing need for environmental compliance show that a more organized and thorough management style is needed.

To deal with these problems, a lot of companies have started using international management standards like ISO 9001, ISO 14001, and ISO 45001 as guides to improve quality assurance, environmental performance, and health and safety at work. In reality, these standards can be added to an Integrated Management System (IMS) to make things run more smoothly, cut down on unnecessary steps, and make sure that information flows consistently through all levels of the business. But IMS doesn't always work well, especially when integration is limited to administrative paperwork and doesn't yet work as a fully evolved, risk-based decision-making system.

This situation is clear at PT. XYZ, where an integrated management system has been put in place but has not led to the best performance results. Several indicators—like project profits that are lower than planned, projects that take longer than expected to finish, a lot of nonconformance reports (NCR), environmental complaints, and safety incidents that keep happening—show that the current level of integration has not made risk control mechanisms that affect project schedule performance strong enough.

This research is essential to systematically assess the efficacy of IMS implementation during the construction phase, identify critical risk factors that affect schedule delays, and recommend options for enhancement to improve overall project performance. A risk-based evaluation method should help the business fill in the gaps and make sure that the integrated management system really does promote quality, safety, environmental performance, and especially timely project delivery.

1.2. Research Purposes

This study aims to evaluate the extent of Integrated Management System implementation at PT. XYZ during the construction phase by identifying and analyzing the key risks that influence project performance. The findings are expected to support the development of targeted recommendations to enhance the effectiveness of the system and strengthen its contribution to improving project schedule performance.

1.3. Operational Model

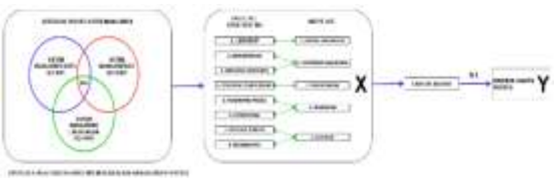

Figure 1. Operation Model

II. THEORETICAL REVIEW

2.1 Integrated Management System PT. XYZ

PT. XYZ's Integrated Management System (IMS) essentially combines multiple management frameworks—covering quality, environmental stewardship, and occupational health and safety—into one unified structure that is supposed to operate in a coherent way. The system is structured around 5 (five) broad clause groups, which outline how the company manages its organizational context, leadership commitment, planning mechanisms, execution processes, and performance evaluation.

Regarding organizational context, PT. XYZ makes a systematic effort to understand the internal and external conditions that shape its strategic direction. Internally, this includes the company's vision, mission, core values, and the governance principles that guide its operations. Externally, the company must respond to shifting construction industry trends, regulatory expectations, technological developments, and competitive pressures. Even minor external disturbances can sometimes influence project outcomes, so having a strong understanding of these contextual elements becomes quite essential for the IMS to function properly, although in practice it is not always perfect.

Leadership commitment is another central component, and without it the system would probably not operate effectively. Senior management is expected to allocate adequate resources, ensure that IMS requirements are embedded within business processes, and cultivate a workplace environment that prioritizes safety, cleanliness, and efficiency. The emphasis on process approaches and risk-based thinking helps the organization maintain quality performance, safeguard environmental assets, and protect employee well-being. These commitments are formalized in corporate policies applied across all levels, supported by a structured system of recognition and disciplinary measures—which, although sometimes strict, is intended to keep the system consistent.

Within the planning phase, each department or functional unit is responsible for preparing operational plans that consider risks and opportunities related to safety, quality, cost, scheduling, environmental issues, and organizational integrity. Besides identifying and evaluating risks, PT. XYZ must also continually reassess shifts in business demands, customer expectations, and applicable legal requirements. Understanding technical specifications, internal capabilities, and resource availability is also emphasized to ensure that project deliverables meet stakeholder needs. The objectives developed in this phase generally aim to satisfy quality standards while simultaneously addressing K3L (health, safety, and environmental) considerations.

Implementation relies on a clear organizational hierarchy that specifies roles and responsibilities, supported by committees dedicated to quality and HSE at both corporate and project sites. Structured change management processes are used to ensure that modifications to workflows or organizational arrangements do not introduce unexpected risks. Infrastructure and working environments are maintained to support safety, comfort, and productivity—even though conditions in the field sometimes differ from the ideal described in policy documents. Continuous training programs help employees understand the IMS requirements and the hazards they may encounter. Meanwhile, internal and external communication systems facilitate participation, feedback, and consultation; they also coordinate the collection and processing of customer comments.

During the evaluation stage, PT. XYZ's senior leadership conducts routine performance monitoring, corrective actions following incidents or nonconformities, internal auditing, and periodic management reviews. These practices help determine whether the IMS is functioning as planned and whether improvements are necessary. The company also promotes continuous improvement across departments, encouraging a kind of healthy competition that, in theory at least, supports learning and operational refinement as part of everyday activities.

2.2 Management System Integration

Management system integration is commonly understood as a managerial approach that brings together various organizational elements into a single, coherent framework designed to support the achievement of strategic goals and institutional missions [4]. Such integration occurs when two or more systerns are combined in a way that reduces their operational independence, yet maintains the functional identity of each system involved [5]. In practice, organizations integrate management standards and documentation to create synergy across units, enabling more aligned implementation of policies and operational routines [10]. This process also facilitates the sharing of tools, methods, and structured management practices throughout different organizational domains, each guided by its respective standards [1].

In many organizations, the integration of management systems is operationalized through three principal approaches: process integration, audit integration, and the alignment of risk-related elements. These approaches are commonly adapted from the harmonized structure of international standards, including those built on the High Level Structure (HLS), which provides a uniform basis for consolidating multiple ISO standards into one integrated framework [4]. A number of empirical studies have demonstrated that integrated processes and combined audits can substantially reduce duplicated activities, streamline internal audit cycles, and support management in meeting multi-standard requirements more efficiently [10].

Although the clauses of the major management system standards- OMS, OHSMS, and EMS- appear parallel in structure, only certain clauses can be effectively integrated in practice. Evidence from the manufacturing sector in Indonesia suggests that Integrated Managernent Systemns (IMS) contribute not only to operational performance improvements but also to reduced documentation burdens and avoidance of overlapping audits derived from different standards [9].

The foundational principles of quality, environmental, and occupational health and safety management standards rely heavily on the philosophy of continuous improvement expressed through the PDCA cycle [11]. PDCA itself provides a structured mechanism for ongoing improvement and problem-solving [8]. Within this framework, planning involves defining changes or improvements and assessing the existing conditions [1]. This phase is typically followed by implementation, verification of results through monitoring and evaluation, and finally, the introduction of corrective actions to ensure further enhancement.

2.3 Process Integration in Management Systems

Process integration is broadly defined as a method for reducing resource consumption and minimizing environmentally harmful emissions [10]. According to the same authors, the adoption of Integrated Management Systerns (IMS) has exppanded rapidly, particulary within the domains of environmental protection, quality assurance, and occupational health and safety in the manufacturing sector.

Integrating processes is increasingly viewed as a strategic step toward optimizing resource conversion, eliminating redundant activities, and strengthening organizational efficiency. Recent studies also note that effective process integration contributes positively to broader sustainabllity outcomes in both construction and industrial settings [3].

In contemporary organizations, process integration typically refers to the consolidation of several management systems---most commonly quality (SO 9001), environmental (ISO 14001), and occupational health and safety (ISO 45001)into a single framework that streamlines procedures, aligns objectives and responsibilities, and merges internal audit cycles [3]. These technical and operational alignments are fundamental to ensuring that IMS functions cohesively and does not fragment across different standard requirements [10].

Research examining the degree of integration has shown measurable benefits. Integrated systemns tend to reduce duplicated work, improve cross-unit alignment, strengthen communication patterns, and promote more focused problemn-solving [5]. They are also associated with hig her sustainability performance, particularly in areas related to product quality, environmental management, and workplace safety [3].

Initially, the process integration approach emerged from the need to unify diverse standards so that organizations could manage multiple domains within a single structure. Such unification avoids procedural duplication, simplifies audits, and supports long-term organizational sustainability [5]. Core indicators that reflect process integration generally include the alignment of procedures and work instructions, coherence in organizational structure, and the merging of business processes-elements that have been widely observed in IMS practices across industrial sectors [6].

Although IMS is built upon varied standards, its basic principles remain closely tied to the PDCA model. The adoption of the modern High Level Structure further strengthens integration by harmonizing the clause architecture across standards without diminishing their specific intent [4]. Through PDCA, organizations are guided to plan, implement, verify, and improve their quality, environmental, and safety performance in a unified and continuous manner.

[7] highlight several indicators that represent the integration of processes:
a) harmonized procedures and work instructions:
b) alignment of organizational structures;
c) realization of integrated business processes.

Building on earlier research, eight clauses have been identified as suitable for integration within IMS, namely:
a) the scope of the management system (Clause 1 IS0:2015) linked with organizational context (Clause 4 IS0:2015);
b) leadership (Clause 5 ISO:2015):
c) integrated management policies (Clause 5.2 ISO:2015), including normative references and terminology,
d) planning (Clause 6 IS0:2015);
e) support processes (Clause 7 ISO:2015);
f) operational control (Clause 8 ISO:2015);
g) Performance evaluation (Clause 9 ISO:2015);
h) Improvement (Clause 10 ISO:2015).

2.4 Correlation Between the HLS IMS and PT. XYZ's IMS

The correlation between the High Level Structure (HLS) and. PT. XYZ's Integrated Management System (IMS) demonstrates how the organization alians international management system standards with its internal operational framework The HLS comprising eight core dlauses (Scope, Leadership, Integrated Policy, Planning, Pracess Support, Operation, Performance

Evaluation, and Improvement) serves as the structural foundation for 1S0-based management systems such as ISO 9001, ISO 14001, and ISO 45001. PT. XYZ adapts these eight clauses into five integrated components within its IMS, namely Organization Context, Management Commitment, Planning, Implementation, and Evaluation.

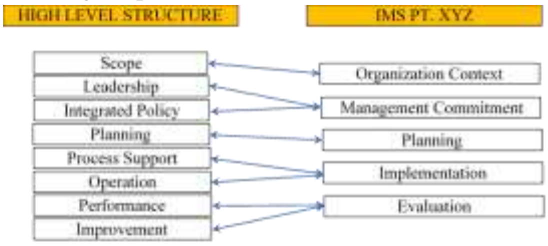

Figure 2. HLS IMS and PT. XYZ's IMS

III. RESEARCH METHOD

This study used archival analysis, a case study approach, and survey methods. Archival analysis was used to examine procedures, policies, planning documents, and updated corporate data related to PT. XYZ. The case study approach was conducted to investigate in detail a specific program, event, activity, process, or group of individuals. In addition, the survey method was utilized to assess the existing information system, identify the factors contributing to its suboptimal performance, and determine the necessary functions that should be added to enhance its overall value.

During the first stage, data collection and analysis are carried out by validating the processes related to the policies and guidelines of PT. XVZ's Integrated Management System. This is conducted using a questionnaire developed from a literature review that identifies factors potentially infiuencing project performance. Through this analysis, the researcher obtains an overview of the current or existing condition of PT. XYZ's Integrated Management System.

In the second stage, data collection and analysis aim to validate the objectives of the Integrated Management System by correlating the eight clauses of the High Level Structure with the five clauses of PT. XYZ's Integrated Management System. This step enables the researcher to determine the objectives of the integrated systemn during the construction phase that influence project time performance.

The third stage of data collection and analysis focuses on validating the risk variables associated with each objective clause. The validation process produces an output consisting of risk variables relevant to the objectives of the integrated management system at the construction stage.

The fourth stage involves collecting and analyzing data through a pilot survey, which is conducted to ensure that the questionnaire can be clearly understood by respondents. The intention of this pilot survey is to refine the questionnaire so that the final version distributed to respondents is easy to read and interpret.

In the fifth stage, data collection and analysis are conducted to evaluate responses from survey participants regarding the frequency of risks and their impact on project time performance. This stage includes descriptive analysis and qualitative risk assessment, supported by homogeneity tests, validity tests, and the use of a Probability and Impact Matrix for determining risk levels.

The sixth stage of data collection and analysis focuses on identifying the impacts and causes of risks affecting project time performance, In this stage, risk responses are formulated as part of the process of developing options and determining actions to enhance opportunities and reduce threats to project objectives.

IV. RESEARCH RESULT AND DISCUSSION

4.1 Risk Level Analysis

The analysis used in this study is the Probability and Impact Matrix to determine the level of each risk variable. categorized as high, medium, or low. To obtain the final frequency and impact scores for each variable, the number of respondents selecting each scale was multiplied, then summed, and subsequently divided by the total number of respondents. In this study, the total number of respondents was 68, resulting in the final average values for both frequency and impact.

The results of the risk value (FR), ranking, and risk level calculations can be seen in table 4.1 below.

Table 4.1 Risk Level Analysis Result

Code	Avg. Freq. Score	Avg. Impact Score	Risk Value	Level	Risk Ranking
X1.T1.1	0.529	0.321	0.17	Moderate	20
X1.T1.2	0.591	0.458	0.27	High	2
X1.T1.3	0.526	0.339	0.18	Moderate	13
X1.T1.4	0.576	0.366	0.21	High	6
X1.T1.5	0.544	0.344	0.19	Moderate	12

Table 4.1 Risk Level Analysis Result (Continued)

Code	Avg. Freq. Score	Avg. Impact Score	Risk Value	Level	Risk Ranking
X1.T1.6	0.571	0.306	0.17	Moderate	17
X1.T1.7	0.532	0.326	0.17	Moderate	18
X1.T2.1	0.556	0.488	0.27	High	1
X2.T1.1	0.526	0.315	0.17	Moderate	24
X3.T1.1	0.526	0.289	0.15	Moderate	32
X3.T1.2	0.503	0.327	0.16	Moderate	26
X3.T1.3	0.512	0.335	0.17	Moderate	19
X3.T1.4	0.559	0.364	0.20	Moderate	7
X3.T1.5	0.553	0.321	0.18	Moderate	15
X4.T1.1	0.585	0.412	0.24	High	3
X4.T1.2	0.612	0.390	0.24	High	4
X4.T1.3	0.559	0.346	0.19	Moderate	9
X4.T2.1	0.532	0.298	0.16	Moderate	31
X4.T2.2	0.626	0.372	0.23	High	5
X4.T2.3	0.518	0.293	0.15	Moderate	33
X4.T3.1	0.553	0.358	0.20	Moderate	8
X4.T3.2	0.582	0.327	0.19	Moderate	10
X4.T3.3	0.576	0.303	0.17	Moderate	16
X4.T4.1	0.550	0.344	0.19	Moderate	11
X4.T5.1	0.550	0.324	0.18	Moderate	14
X4.T5.2	0.468	0.265	0.12	Moderate	35
X4.T5.3	0.553	0.297	0.16	Moderate	27
X4.T5.4	0.521	0.312	0.16	Moderate	29
X4.T5.5	0.479	0.332	0.16	Moderate	30
X4.T5.6	0.503	0.330	0.17	Moderate	25
X4.T5.7	0.503	0.287	0.14	Moderate	34
X4.T6.1	0.515	0.326	0.17	Moderate	23
X5.T1.1	0.491	0.333	0.16	Moderate	28
X5.T2.1	0.526	0.319	0.17	Moderate	22
X5.T2.2	0.518	0.326	0.17	Moderate	21

Based on the results of the risk level analysis, the next step is to determine the risk factors classified as high level risks and rank them accordingly. There are six hight level risk factors, which have been ranked as presented in table 4.2

Table 4.2 Highest Risk Factor

Ranking	Code	Value of Risk	Level
1	X1.T2.1	0.271	High
2	X1.T1.2	0.270	High
3	X4.T1.1	0.241	High
4	X4.T1.2	0.238	High
5	X4.T2.2	0.233	High
6	X1.T1.4	0.211	High

4.2 High Risk Rating and Response

Risk response is the process of developing options and determining actions to enhance opportunities and reduce threats to project objectives. The risk responses identified consist of preventive actions, which serve as proactive measures to minimize the potential impact of risks, and corrective actions, which function to address and rectify issues that have occurred to prevent the recurrence of negative consequences on the project.

Table 4.3 presents the six highest-risk factors and the corresponding risk responses, including both preventive and corrective actions.

Table 4.3 Risk Response

Code	Preventive Actions	Corrective Actions
Organization Context (X1)		
To understand the organization and its context, as well as to identify the company's needs and expectations. (X1.T2)		
X1.T2.1 Worker abenteeism (Company Employee, Daily workers, subcontrator workers)		
	• Implementing an integrated attendance and workforce monitoring system (digital or manually based on daily reports)	• Enhancing field supervision
	• Improving comfort and safety conditions in the work area and strengthening OHS implementation on site	• Re-sequencing the work plan
	• Preparing manpower	

Code	Preventive Actions	Corrective Actions
	requirement and mobilization plans	
To identify the organization's external and internal issues (X1.T1)		
X1.T1.2 Weak partner selection		
	• Implementing a qualification evaluation (prequalification) covering experience, financial capacity, equipment, etc	• Re-sequencing the work plan

Table 4.3 Risk Response (Continued)

Code	Preventive Actions	Corrective Actions
	• Conducting final partner performance assessments after project completion • Selecting partners using a combined price - quality method (best value selection)	• Rework (corrective work)
X1.T1.4 Construction companies have not yet been able to determine risk controls related to guality, safety, security, occupational health, and the environment		
	• Developing and implemnenting risk control procedures that integrate quality, environmental, and OHS aspects in a single integrated management system document	• Re-sequencing the work plan
	• Conducting risk management training and socialization based on IMS for all organizational levels	• Rework (corrective work)
	• Optimizing cross-functional coordination through regular risk meetings involving HSE, Quality, and Project Control	• Conducting structured daily/weekly coordination me etings
Implementation (X4)		
To determine and provide the resources required for the establishment, implementation maintenance, and continual improvement (X4.T1)		
X4.T1.1 Lack of competent human resources		
	• Establishing HR competency standards based on project needs and the requirements of the Integrated Management System (1SO 9001, 14001, 45001)	• Rework (corrective work)

Table 4.3 Risk Response (Continued)

Code	Preventive Actions	Corrective Actions
	• Conducting periodic training and competency certification progra ms • Developing a performance and competency based evaluation and career development system	• Conducting structured daily/weekly coordination meetings
X4.T1.2 Insufficient financial resources		
	• Preparing a detailed project cash flow aligned with the work schedule and payment terms • Implementing a risk-based financial management system • Ensuring smooth internal communication	• Enhancing field supervision

	between finance, project teams, and top management to support fast decision-making	
To determine competency requirements, where competency criteria must be establishec for each function and role relevant to the management system (X4.T2)		
X4.T2.2 Lack of human resources with competencies in management systems		
	• Establishing IMS competengy criteria during the recruitment and project assignment process • Conducting internal training and certification programs related to IMS (ISO 9001, 14001, 45001) • Developing a continuous competency development plan	• Conducting structured daily/weekly coordination meetings

V. CONCLUSION

Based on the tests and analyses that have been conducted, the following conclusions ca be drawn:

1. The eight clauses of the High Level Structure consisting of scope, leadership, integrated policy,. planning, process support, operation, performance, and evaluation - are implemented in PT. XYZ's Integrated Managernent System and consolidated into five clauses, namely Organization Context, Management Comnmitment, Planning, Implementation, and Evaluation.
2. There are two managerent system clauses and two corresponding objectives that significantly influence this study: Organization Context, with the objectives To understand the organization and its context, as well as to identify the company's needs and expectations (X1.T2) and To identify the organization's external and internal issues (X1.T1); and Implementation, with the objectives To determine and provide the resources required for the establishment, implementation, maintenance, and continual improvement (X4.T1) and To determine competency requirements, where competency criteria must be established for each function and role relevant to the management systern (X4.T2).
3. The analysis of risk levels identified six highest-risk events, namely: Worker absenteeism (Company emplovees, daily workers, subcontractor workers) with a risk value of 0.271: Weak partner selection with a risk value of 0.270; Lack of competent human resources with a risk value of 0.241; Insufficient financial resources with a risk value of 0,238; Lack of human resources with competencies in management systems with a risk value of 0233; and Construction companies have not yet been able to determine risk controls related to guality, safety, security, occupational health, and the environment with a risk value of 0.211.
4. The preventive measures identified in this study show that strengthening organizational management, workforce competence, and integrated risk control is essential for reducing uncertainties and improving project time performance. Actions such as enhanced workforce monitoring, improved site safety, structured manpower and financial planning, rigorous partner selection, and standardized competency development contribute to more reliable construction processes. Additionally, regular training, effective internal communication, and unified risk procedures that integrate quality, environmental, and accupational health and safety requirements enable better coordination and faster decision-making, Collectively. these measures reinforce the organization's ability to prevent delays and ensure consistent project outcomes.
5. The corrective actons implernented indicate that enhanced field supervision, rework execution, re sequencing of work plans, and structured routine coordination meetings are essential steps to address deviations occurring during project execution. These measures help restore project time performance, improve operational efficiengy. and prevent similar issues from recurring in subsequent stages.A conclusion section must be included and should indicate clearly the advantages, limitations, and possible applications of the paper. Although a conclusion may review the main points of the paper, do not replicate the abstract as the conclusion. A

conclusion might elaborate on the importance of the work or suggest applications and extentions.

REFERENCES

[1] Baidhok, W. (2024). Reslaj: Religion Education Social Laa Roiba Journal Integrasi Penerapan Sistem Manajemen ISO 9001 dan ISO 14001 pada Perusahaan Rekanan Pertamina. https://doi.org/10.47476/reslaj.v6i3.5526

[2] Budgol, M., & Biesbroek, R. (2015). Integrated Management System. Springer International Publisher.

[3] Erwin, Supriatna, A., Pujiastuti, E. T., Heningtyas, O. S., Sunarti, H., & Faturahman, D. (2024). INTEGRATED MANAGEMENT SYSTEM TO IMPROVE CORPORATE SUSTAINABILITY PERFORMANCE: A CASE STUDY IN THE PHARMACEUTICAL MANUFACTURING INDUSTRY INDONESIA. International Journal of Business and Society, 25(2), 555–572. https://doi.org/10.33736/ijbs.7616.2024

[4] Francisco, F. E., Costa, A. C. F., Alexandre Costa Araújo Sampaio, P., Domingues, P., & de Oliveira, O. J. (2024). Implementation and improvement of Integrated Management Systems: recommendations for their adaptation to the ISO High-Level structure. Cleaner Environmental Systems, 15. https://doi.org/10.1016/j.cesys.2024.100227

[5] Gani, M. J., Muhibuddin, A., & Bahri, S. (2023). Efektifitas Penerapan Sistem Manajemen Terpadu Dalam Peningkatan Kinerja. Paradigma Journal of Administration, 1(2), 50–54. https://doi.org/10.35965/pja.v1i2.3883

[6] Reinoso Avecillas, M. B., Juca Juca, M. H., Condo Aguirre, B. F., & Zambrano Heras, L. E. (2024). Integración de sistemas de gestión en la industria metalmecánica. ConcienciaDigital, 7(2), 67–90. https://doi.org/10.33262/concienciadigital.v7i2.2987

[7] Rofi'udin, M., & Latief, Y. (2017). Integration Process Models of Quality, Safety, Health and Evironmental Management Systems to Achieve Sustainability Construction.

[8] Singh, V. (2013). PDCA cycle: a quality approach. Utthan-Journal of Management Sciences, I(1), 89–96.

[9] Suwardi, W. P., & Nurcahyo, R. (2022). Development of an integrated preparation method for the implementation of ISO 9001, ISO 14001 and ISO 45001: A Case Study from Indonesia Automotive Industry.

[10] Yasin Tuanaya, M., & Basuki, M. (2022). PENERAPAN INTEGRASI RISIKO & AUDIT INTERNAL SISTEM MANAJEMEN UNTUK PENINGKATAN BERKELANJUTAN (STUDI KASUS: PENERAPAN ISO 9001, ISO 14001, & ISO 45001 DI INDUSTRI MANUFAKTUR) (Vol. 45001). https://ejurnal.itats.ac.id/senastitan/article/view/2560/2146

[11] Zeng, S. X., Tam, V. W., & Le, K. N. (2010). Towards Effectiveness of Integrated Management Systems for Enterprises. . Engineering Economics, 21(2), 171–179