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Improving Organizational Performance with ISO 9001 QMS Audits

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Abstract: ***The effective implementation of a Quality Management System (QMS) is essential for organizations striving for excellence and competitiveness, as it significantly enhances overall performance and, in turn, the business's performance. The effectiveness of QMS is commonly assessed using methods such as management reviews, customer feedback analysis and audits. Audits that are aligned with ISO standards play a critical role in evaluating management processes, measuring QMS performance and identifying opportunities for improvement. This study focuses on the importance of QMS audits in improving organizational performance within the framework of the ISO 9001 standard. Research indicates that many organizations conduct internal audits using traditional or qualitative methods which are commonly used and, they often fall short in addressing all the requirements of the ISO 9001 standard. Additionally, these methods heavily depend on the skill and expertise of the auditor, making them less reliable in evaluating QMS performance comprehensively across different levels of an organization. This study examines how audit findings are utilized to guide strategic decision-making and encourage a culture of continuous quality improvement. To overcome the limitations of qualitative methods, a quantitative approach was adopted by developing a customized, comprehensive web-based audit checklist. This checklist encompasses all aspects of the QMS standard, along with contractual, statutory, and organizational requirements. The task-based, detailed checklist helps identify gaps in compliance with objective evidence, enabling management to make well-informed decisions. The study analysed data from 38 projects and 30 functional processes at the head office using web-based statistical tools to assess QMS performance. The results of the study highlight the importance of adopting robust and systematic audit practices. Such practices maximize the potential of QMS, contribute to enhanced organizational performance, and help organizations maintain their competitiveness in a dynamic business environment.***

Keyword: ISO 9001, Quality Management System, Organizational performance, Internal audit, Web-based system.

I. INTRODUCTION

A Quality Management System (QMS) ensures organizations consistently meet customer and regulatory requirements while improving processes. **ISO 9001** is a widely recognized standard that provides a structured approach to building a QMS, focusing on continuous improvement, process control and customer satisfaction. Certification to ISO 9001 demonstrates an organization's commitment to quality, helps streamline operations, reduces errors and enhances credibility globally.

The **ISO** (International Organization for Standardization) develops global standards to ensure safety, efficiency and quality in products and services. While voluntary, ISO standards help organizations comply with regulations, manage risks and improve performance. ISO certification, achieved through accredited audits, signals dedication to quality and provides a competitive edge.

Evaluating a QMS involves techniques like internal audits, management reviews, customer feedback and performance monitoring. These processes ensure compliance, identify areas for improvement, and align operations with ISO 9001 standards. This study focuses on improving the internal audit process within QMS to enhance compliance, address non-conformities and improve performance. It aims to develop a web-based tool for assessing QMS performance, using real project data to optimize audit effectiveness and boost efficiency, product quality and customer satisfaction.

II. LITERATURE REVIEW

A quantitative approach to measuring the performance of a Quality Management System (QMS) at the organisational level involves using numerical data and statistical methods to assess how effectively the QMS is functioning. The research articles most relevant to this project have been reviewed and are listed below:

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A. "Effectiveness of Quality Management System audit to improve quality performance - A conceptual framework" Edly Ramly, Efizah Ramly, Shari Mohd Yusof, (2008).

This study investigates the effectiveness of Quality Management System (QMS) audits in enhancing quality performance within Organisations. By addressing various challenges related to QMS audits, the research highlights the significance of these audits in identifying areas for improvement and driving Organisational quality. Through a comprehensive literature review, the paper discusses critical issues such as audit frequency, auditor competency and the alignment of audit processes with Organisational goals. It also proposes a conceptual framework designed to optimize the audit process, ensuring that it effectively contributes to the desired quality outcomes. This framework aims to guide Organisations in implementing more effective QMS audits, leading to improved quality performance and greater overall efficiency.

B. "Building a Performance Measurement Internal Auditing Framework for the ISO 9001 Quality Management System" Flor Monica Gutierrez Alcantara, (2013).

This research centres on internal auditing within the ISO 9001 Quality Management System (QMS) and aims to create a performance-oriented framework for evaluating QMS performance. The study identifies key shortcomings in traditional ISO 9001 audits, which typically emphasize compliance rather than delivering additional value to Organisations. To address these issues, the research employs a mixed-methods approach, incorporating both surveys and interviews with industry practitioners. This approach leads to the development of a comprehensive procedure for conducting internal audits that prioritize performance improvement. By focusing on enhancing Organisational effectiveness and value creation, the framework aims to transform the internal audit process into a more strategic tool that not only ensures compliance but also fosters continuous improvement and better alignment with Organisational goals.

C. "Effect of The Implementation of ISO 9001:2015 Quality Management System on The Performance of Companies and Consumers in The Chemical Industry," Hari Yuliansyah, Erry Rimawan, Antonius Setyadi, (2022).

This research investigates the effects of implementing ISO 9001:2015 on both organisational performance and customer impact within the Indonesian chemical industry. The study aims to identify key factors that influence the success of ISO 9001 implementation and how these factors affect overall performance. Utilizing Structural Equation Model-Partial Least Square (SEM-PLS) analysis, data was collected from 103 samples to assess these relationships. The findings reveal a positive and noteworthy influence of ISO 9001 implementation on both customer impact and Organisational performance. Additionally, the study highlights the importance of factors such as external audits and teamwork in facilitating successful implementation. These insights contribute to a deeper understanding of how ISO 9001 can enhance both company performance and customer satisfaction in the chemical sector, providing valuable implications for industry practitioners.

D. "Quality Management and Performance: A review" Rajesh K. Singh, (2010).

Considering globalization and economic challenges, this paper examines the relationship between Quality Management (QM) practices and Organisational Performance by reviewing 120 research papers. The study identifies several key issues that influence the implementation of Total Quality Management (TQM) and its subsequent impact on performance outcomes. Additionally, it explores the circumstances under which TQM initiatives may fail, providing insights into common pitfalls regarding organisations face. By identifying gaps in the existing literature, the research highlights areas that require further exploration, particularly in developing frameworks for assessing TQM effectiveness and prioritizing critical success factors essential for successful implementation. This comprehensive review aims to contribute to a deeper understanding of TQM's role in enhancing Organisational performance amid evolving global dynamics.

E. "Quantifying Quality Management System performance audit order to improve business performance," R.A. Smith, A. Bester, M. Moll, (2014)

This study presents a novel methodology for quantifying the performance of Quality Management Systems (QMS) with the goal of enhancing overall business performance. By integrating metadata into existing historical or current QMS internal audit data, the research illustrates how Organisations can extract valuable insights that span from high-level strategic direction to the effectiveness of specific processes and implementation guidance. The proposed methodology involves combining cause-and-effect theming data with process-consequence severity data to enrich QMS audit findings. This integration allows for a more comprehensive analysis of audit results, enabling Organisations to identify trends and areas for improvement over time.

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The methodology provides a framework for Organisations to leverage data-driven insights to enhance their quality management efforts and drive better business outcome.

III. METHODOLOGY

An audit is a systematic way to review and evaluate how well a Quality Management System (QMS) is working. The main aim is to confirm how the QMS is implemented, maintained and improved effectively. This study uses a performance measurement approach focusing on construction projects and office processes.

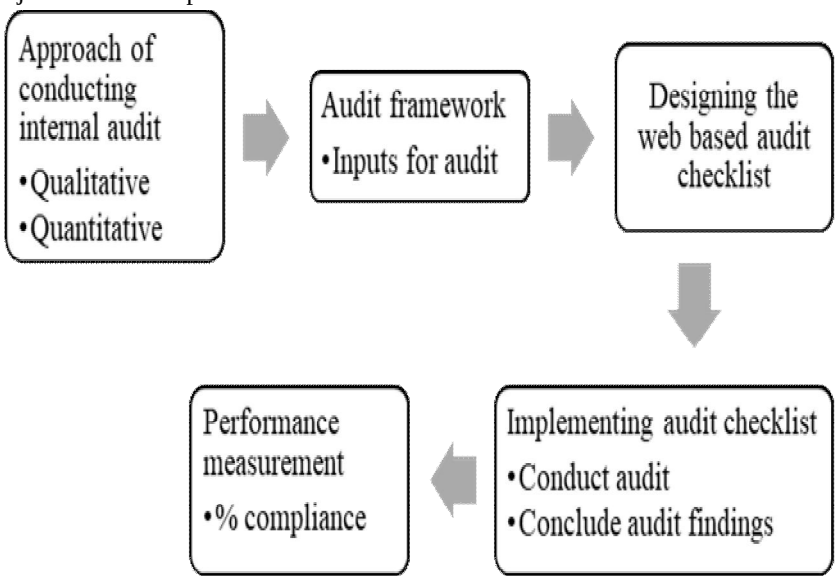


Figure No. 1 Flow chart of methodology.

A. Internal Audit Approach

1) Traditional (Qualitative): Relies on document reviews, interviews and observations to assess compliance with ISO standards and processes.

2) Web-based (Quantitative): Uses data and numbers to evaluate QMS performance, enabling statistical analysis for more objective results.

B. Audit framework

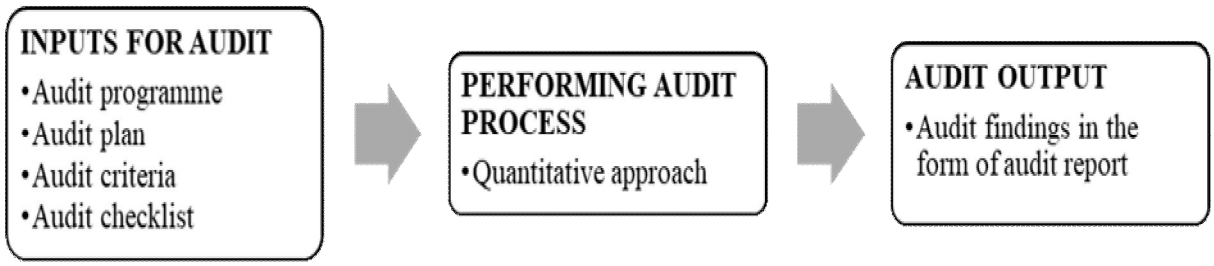


Figure No. 2 Audit as process.

The audit process follows these steps:

Inputs for audit

1) Audit programme: Plan detailing audits over time, including project names, locations, auditors, timelines and audit methods (on-site or remote).

2) Audit plan: Lists the scope, objectives and process steps for the audit.

3) Audit criteria: Standards or benchmarks (ISO, laws or internal rules) against which processes are compared.

4) Audit checklist: Tool listing requirements (generic and specific) to guide the auditor in evaluating compliance.

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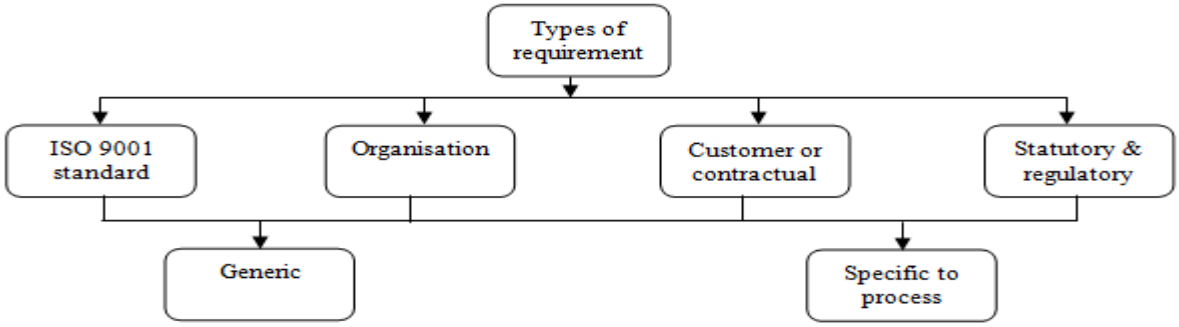


Figure No. 3 Types of requirements

C. Web-based audit checklist design

1) Generic requirements: Common standards from ISO 9001, like management, resources and performance.

2) Specific requirements: Unique to the organization, based on internal procedures and operational goals.

D. Audit execution steps

1) Opening meeting: Discuss objectives, scope and method with key personnel.

2) Audit process: Use the web-based checklist to review processes, gather evidence and document findings.

3) Sampling and findings: Select key areas for evaluation, focusing on compliance and improvement opportunities.

4) Nonconformance management: Record issues, assign corrective actions, and track resolution.

5) Closing meeting: Declaring audit findings to the Auditee or process owner and their acknowledgement & commitment to comply identified gaps in system.

E. Internal audit report

A detailed document summarizes audit results, highlighting:

1) Strengths: Areas where the QMS is effective.

2) Observations: Opportunities for improvement.

3) Nonconformance: Issues requiring corrective actions.

F. Concluding audit findings

After review by process owners and the Management Representative (MR) team, findings are finalized and shared with relevant teams to implement corrective actions. This ensures compliance, efficiency and improved QMS performance.

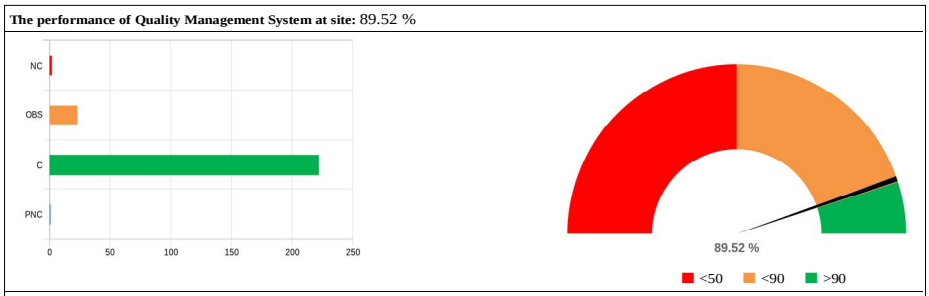
IV. RESULTS

A measurable, customized web-based audit checklist focuses on quantifiable outcomes during internal audits to ensure alignment with organizational standards and regulatory requirements. Audit checklist framed with quantitative metrics and performance indicator to each specific processes so that auditor able to capture the real time data. The checklist integrates with dashboards to analyse data, spot trends and generate performance reports. It also enhances objectivity, efficiency and informed decision-making, making audits more focused and results driven.

The Internal Audits were successfully conducted using the established audit checklist, as outlined in the research methodology. A total of 38 projects audit reports and 30 reports from head office functional processes were collected, reviewed and analysed. The goal of this data collection and analysis is to evaluate and enhance the compliance rate of the organization's QMS. Compliance at various levels was measured by comparing the total compliance points to the total checkpoints at both the project and process levels. Based on this quantifiable approach, analysis of audit data done on various stages such as:

Percentage Compliance at project level - % Performance of the QMS at Missing Link project is measured as 89.52%, resulting in about 22 observations and 2 nonconformities. Through this data the auditee team able to know about their areas of improvement with respect to project level QMS performance and can initiate the appropriate corrective actions enhance continual improvement in these areas.

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Summary of Audit findings

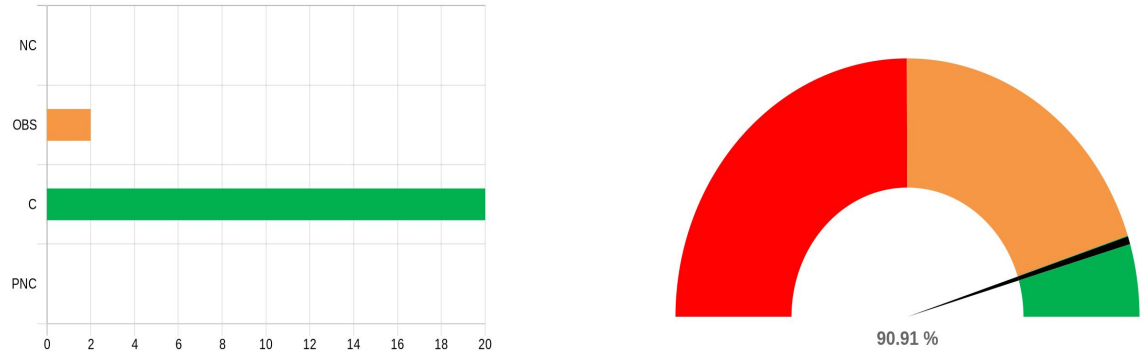
S.NO	Department	C	OBS	NC	PNC
1	Administration	22	2	1	0
2	Construction Plant and Equipment (CPE)	38	2	0	0
3	Earthwork	16	6	1	0
4	Planning & Document Controller	30	5	0	0
5	QS_Subcontracts	20	3	0	1
6	Quality Excellence Cell (QxL)	32	0	0	0
7	Stores & Purchase	26	2	0	0
8	Structure	20	3	0	0
9	Survey	18	0	0	0
	Total	222	23	2	1

Figure No. 4 Percentage Compliance at project level

Percentage Compliance at process level (Design function at head office)

% Performance of the QMS observed at Design function level as 90.19%, indicating 2 observations where in scope for improvement in QMS required.

The performance of Quality Management System - Design process: 90.91 %



Summary of Audit findings

Sr.No.	Department	C	OBS	NC	PNC
1	Design -SS	20	2	0	0
	Total	20	2	0	0

Figure No. 5 Percentage Compliance at process level

A. Percentage Compliance at organisation level

Combining all the findings of the audit reports and measuring the overall performance at the organisation level effectively possible which is observed as presently at 91.15% for audited one Internal audit cycle.

INTERNAL AUDIT FINDINGS ACROSS ORGANISATION		
Total Check Points	9307	C NC OBS PNC

Total Compliance	7819	
Total Observation	722	
Total Nonconformity	26	
% Compliance	91.15	

Figure No. 6 Percentage Compliance at organisation level

B. Percentage Compliance of all projects

With the assistance of web-based tools, the performance of each project can be assessed and compared. This will help identify the projects that are performing below the required standards.

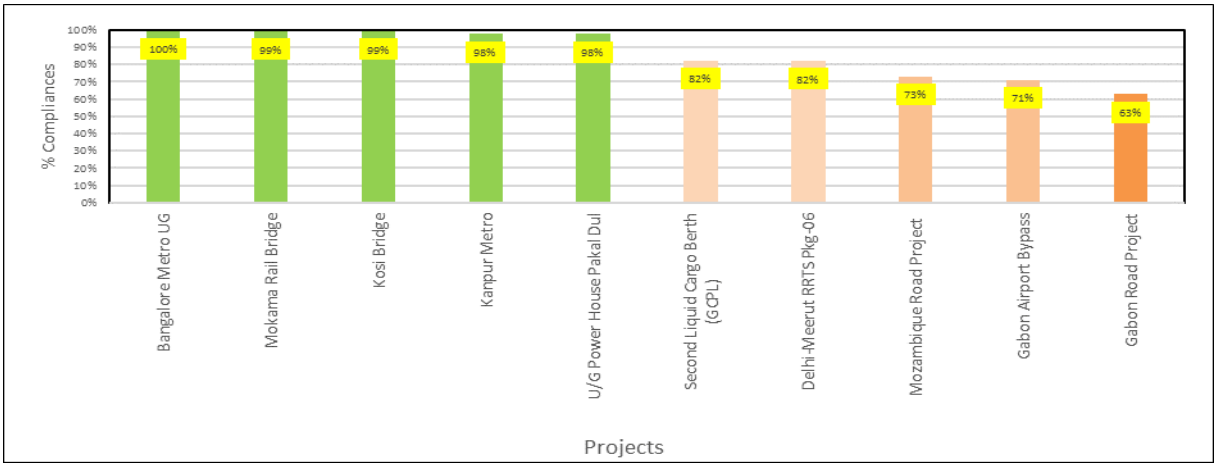


Figure No. 7 Percentage Compliance of all projects

C. Percentage Compliance of processes at head office

Similarly, the performance of each process functioning at head office can be evaluated and compared. This will provide the organization with information on processes that require immediate attention, enabling necessary adjustments to improve their performance.

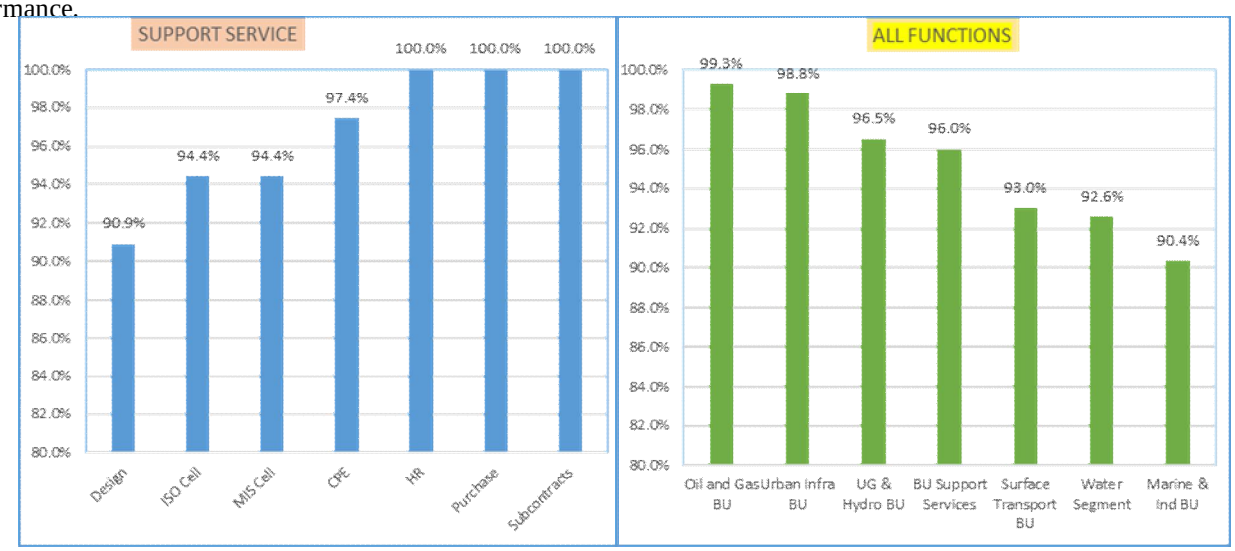


Figure No. 8 Percentage Compliance of processes at head office

D. Analysis of nonconformities reported.

The nonconformities identified across the organization can be categorized at various levels, such as total numbers reported at the organizational level, project vs nonconformities, process vs nonconformities, and clause vs nonconformities. Nonconformities refer to the failure to meet a requirement and this analysis enables the organization to swiftly take necessary actions to eliminate the root causes of these issues, leading to improvements in overall QMS performance.

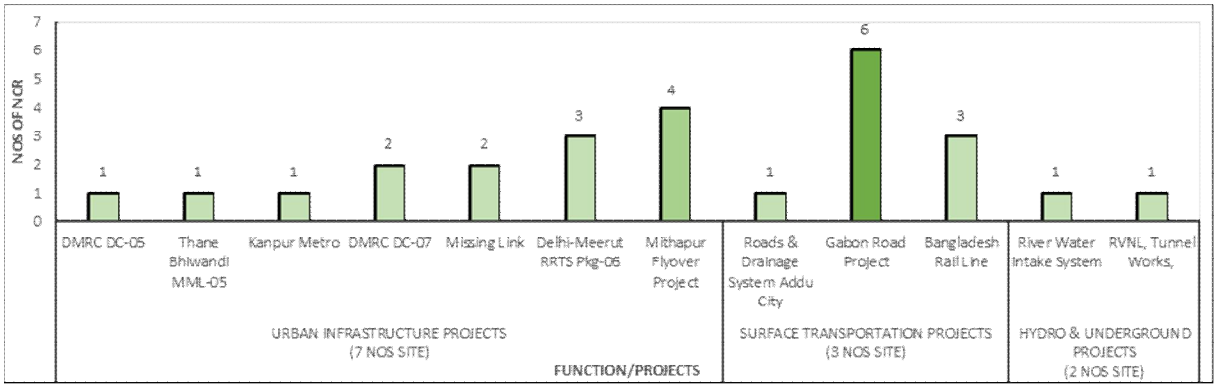


Figure No. 9 Analysis of nonconformities reported

E. Areas of improvement & actions required.

For each category, including both Generic and Specific requirements, areas for improvement can be assessed at the process level. Within each process, the performance of individual activities can be monitored. If a process is not being followed correctly, it can be reviewed, restructured, and appropriate actions planned to enhance performance at the process level.

Table No. 1 Areas of improvement & actions required.

REQUIREMENTS		PROCESS	AREAS FOR IMPROVEMENT	EFFECTED SITES	ACTION REQUIRED
Specific to Process Requirements	QMS performance is < 90%	Design	• Design/Proof consultant performance rating	3	Timely Performance rating.
		QS	• Wastage Statement (Structures) • Wastage Statement (Reinforcement steel)	13 7	Engagement of QS Team in Wastage Control.
	Similar Observations in each process	CPE	• Quarterly Audit for Electrical Instruments	11	Increasing team of Auditor to conduct audits on time.
		QxL	• Internal NCR vide QF 9001 09.	13	Awareness on Importance of internal NCR
		Planning & Monitoring	• Wastage statement for Reinforcement Steel and Reinforcement Steel Issue control - by Steel Engineer	14 12	Awareness on wastage control in Cut & Bend yard.
		Execution	• Wastage statement for Reinforcement Steel (Execution Team) vide format QF MIS 04 D - 3.	13	Awareness on section wise statement.

V. CONCLUSIONS

This study has successfully addressed its primary objective of evaluating and improving the performance of the Quality Management System (QMS) within the organization, focusing on internal audit process. By employing a quantitative approach, the research identified key areas where internal audits could be optimized for better compliance, non-conformity detection, and overall QMS performance.

The development of a comprehensive, web-based framework for measuring QMS performance using key indicators has enabled a systematic evaluation of the internal audit process. Data gathered from ongoing projects within the organization, along with the application of web-based statistical techniques, has provided valuable insights into the current state of the QMS.

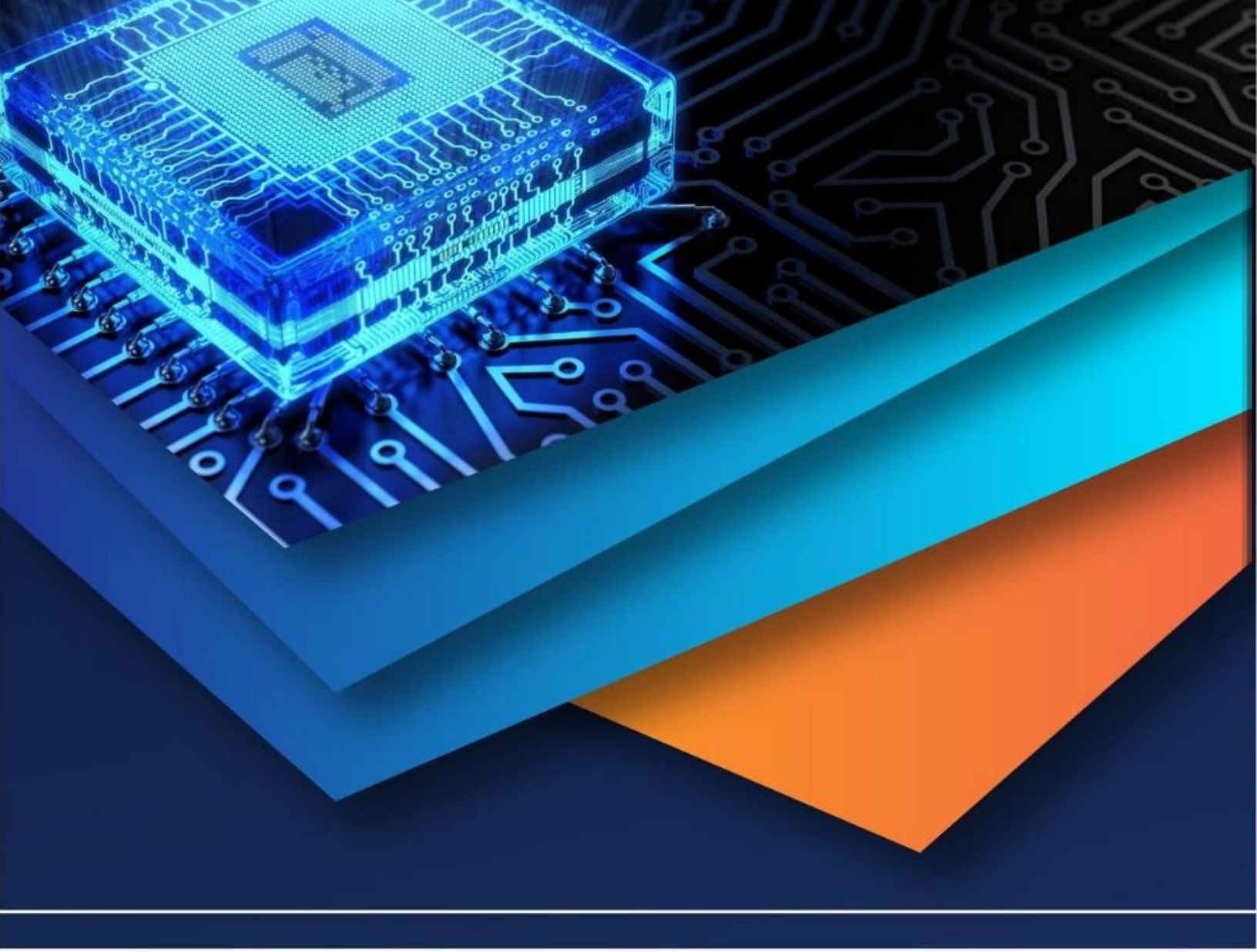
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Through careful analysis, the study identified specific weaknesses and areas for improvement within the internal audit process. As a result, actionable recommendations have been proposed to enhance both the effectiveness of internal audits and the overall efficiency of the QMS. These improvements are expected to lead to higher product quality, increased compliance, and greater customer satisfaction, reinforcing the organization's commitment to continuous improvement in its quality management practices.
This paper emphasizes that organisation performance can improve when management is provided with a quantitative reference to enhance their compliance with QMS implementation, and this compliance is then strengthened.

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