
The Fundamental of Sustainable Supplier- Customer Relation: Digital Audit in Quality Management

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Abstract:

Purpose: The objective of this paper is to analyze the effectiveness and impact of internal and external audit processes through a case study approach. The analysis begins with an internal audit conducted using a digital survey and insights from an external advisory firm, followed by a second layer of scrutiny carried out by a certification body. This comprehensive evaluation aims to highlight the differences in methodologies, outcomes, and the overall implications for organizational performance and compliance. Through this exploration, the study seeks to provide valuable recommendations for optimizing audit practices in various organizational contexts.

Design/Methodology/Approach: This study utilized a mixed-methods approach, integrating theoretical research, a digital survey, qualitative interviews with the management team, and thorough documentation analysis. An audit was conducted across all aspects of the business, including management, core operations, supporting and external processes. Representatives from the management board and process managers participated in the investigations. Following the internal audit, an external audit conducted by a certification body was successfully completed.

Findings: The research underscores the transformative impact of digital surveys on internal audit processes within organization. By leveraging low-cost technology, organizations can enhance their audit practices, leading to more informed decision-making, identification of non-conformity, improved internal compliance, and fulfilment of ISO 9001 requirements.

Practical Implications: The presented approach can be effectively utilized across various types of organizations during the audit process of quality management systems and internal audits of suppliers. By implementing this method, companies can streamline their auditing processes, ensuring consistency and thoroughness in evaluating compliance with established standards.

Originality/Value: The paper emphasized the possibility of maintaining quality management standards by utilizing digital audit tools, which can serve as straightforward and effective solutions for organizations of all sizes—small, medium, and large. These tools provide a streamlined approach to conducting internal audits and supplier evaluations, ensuring compliance with established standards and facilitating continuous improvement. By integrating digital audit systems, organizations can enhance efficiency, reduce time and cost.

Keywords: Quality management systems, audit, Auditor-client relationship, digital transformation.

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1. Introduction

The implementation of quality management systems (QMS) in Poland began in the early 1990s. These initial implementations required significant investments of time and effort, as well as the full engagement of the entire organization. Organizations often sought the assistance of consulting firms to leverage their expertise and support during both the implementation process and the subsequent auditing by certification bodies.

Currently, larger enterprises typically have dedicated organizational units, such as a Quality Manager or Quality Director, along with internal auditors who conduct periodic activities to maintain the QMS. However, micro, small, and medium-sized enterprises often lack these resources, creating an opportunity for ongoing collaboration with suppliers specializing in quality management systems (Krolas and Heilala, 2023).

The literature of quality management systems has many the implementation of quality management systems is extensive, with many studies showcasing specific standards through case studies of selected enterprises. Other authors address various aspects of Quality Management Systems, including risk management, Industry 4.0, organizational efficiency, and corporate social responsibility.

A notable gap exists in research focused on digital tools that support the process of auditing the quality management systems. To explore this gap, the following research questions were formulated:

Q1: Can a digital tool be effectively designed to support and enhance the audit process in quality management systems?

Q2: How can the audit process be expanded to involve a broader range of participants beyond the process owner, and what role can digital tools play in this inclusion?

Q3: What are the potential limitations and challenges associated with using digital surveys as a component of the audit process?

The first part of the paper provides a historical overview of the development of quality management systems in Poland. The second part focuses on the audit process within quality management systems.

To address the practical aspects of the research, collaboration with a consulting firm was undertaken. A digital survey was developed for a selected organization to support its audit process. The survey's findings served as a foundation for implementing improvement actions. The case study was conducted in a large organization based in the Greater Poland region.

Quality management systems (QMS) play an important role in ensuring organizations operate efficiently while aligning with sustainability principles. This paper explores the historical evolution of QMS in Poland and delves into the audit processes that underpin their continuous improvement.

2. Literature Review

In the early 1990s, the Polish market noticed the first applications of the International Organization for Standardization's (ISO) quality management system (QMS) (Królas, 2020). The ISO 9000 series, which has been in existence for over thirty years, continues to be a key product of the ISO. Since its debut in 1987, the series has gone through several significant updates, with the most important one occurring in 2000, where a process-oriented model was adopted, leading to the discontinuation of ISO 9002 and 9003.

The latest revision for ISO 9001, released on September 15, 2015, brought in several important changes, including the incorporation of risk management, an increased emphasis on customer empowerment and motivation, and a stronger focus on the responsibilities of top management in fulfilling the standard's requirements (Midor and Wilkowski, 2021).

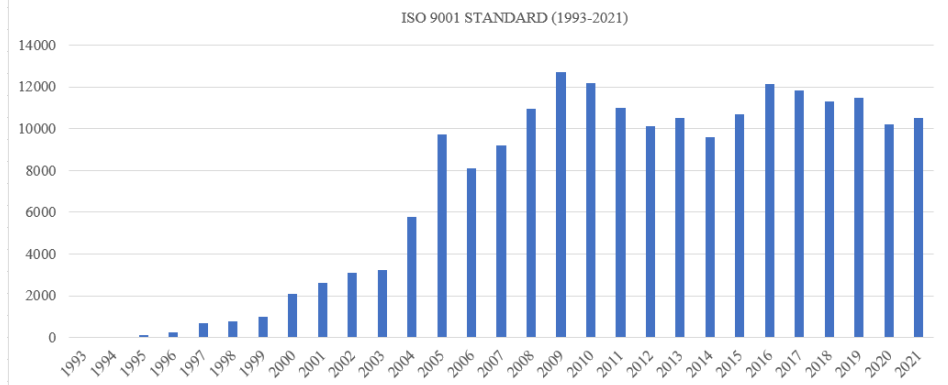
More than one million organizations worldwide across 170 countries are certified under ISO 9001, with approximately 400,000 certifications issued in Europe (www.iso.org). In Poland, ISO 9001:2015 has become the most widely recognized QMS standard. Holding this certification is often essential for participating in public tenders, underscoring its importance. Over the years, the number of certificates granted by certification bodies has evolved.

In the early 1990s, large manufacturing firms were the primary subscribers to these standards, striving to boost process efficiency, encourage an objective measurement focus, improve employee competencies, and implement a continuous improvement cycle as prescribed by ISO guidelines (Królas and Heilala, 2023). Over time, medium and small businesses also adopted the QMS.

The issuance of ISO 9001 certificates has fluctuated, initially showing a steady increase from the 1990s to 2002, followed by a notable surge from 2003 to 2005, correlating with Poland's entry into the EU on May 1, 2004. The peak number of certificates issued reached 12,000 in 2009. Between 2011 and 2021, the number of certificates remained relatively stable, with over 10,000 certified quality management systems in place (www.iso.org) (Figure 1).

Figure 1 illustrates the distribution of issued ISO 9001 certificates. It is important to note that some organizations implement the ISO 9001 standard but choose not to obtain certification due to financial constraints.

Figure 1. Number of ISO 9001 Certificates Issued in Poland.



Source: Own study based on iso.org.

One of the most popular elements of quality management systems is auditing, defined as a systematic and independent examination of a Quality Management System (QMS) to determine whether it conforms to the planned arrangements—as per the requirements of ISO 9001—if it is effectively implemented, and whether it is being maintained. Audits can serve various purposes, including compliance assessment, performance improvement, or verifying that the QMS meets the organization's quality objectives (Israa et al, 2020).

In the context of these quality management systems, audits can be categorized into three main types :

First-Party Audits: Conducted internally by the organization's personnel or by consultants engaged by the organization, focusing on internal processes and compliance with internal standards.

Second-Party Audits: Performed by customers or clients on their suppliers to ensure that the supplier meets contractual and regulatory requirements.

Third-Party Audits: Conducted by independent external bodies, often for certification purposes to recognized standards, providing credibility and assurance to stakeholders.

The increasing adoption of these quality management practices and audits reflects an overarching commitment to enhanced operational performance and the safeguarding of employee well-being in the workplace. Internal audits are crucial for maintaining ISO 9001 certification and should be conducted annually with a focus on improving project management and product quality. The true measure of audit effectiveness lies

not in the sheer number of findings but rather in their ability to drive organizational improvement (Karri *et al.*, 2021).

Despite facing challenges such as data security and the requirements for extensive documentation, digital audits also offer opportunities for organizations to refine their processes and enhance their overall quality management practices. By integrating sustainability considerations into digital audits, organizations can not only improve their operational efficiency but also contribute to environmental protection and resource conservation. These audits provide a platform to evaluate and optimize practices such as energy consumption, waste management, and supply chain transparency. Balancing the benefits and complexities of digital audits is essential for effective quality assurance in today's digital age, particularly when aiming to align with global sustainable development goals (Dudina *et al.*, 2022).

3. Research Methodology

The research was done based on Beta² organization. Beta is a Polish organization specializing in the recycling of non-ferrous metals and the processing of secondary raw materials. It operates in the market with a focus on sustainable development, offering comprehensive solutions related to the recovery of valuable resources, which contributes to environmental protection. Thanks to modern technologies and high-quality recycling processes, Beta has gained the trust of many clients, providing services to both industry and individual customers.

The company emphasizes innovation, efficiency, and ecological responsibility in its operations. Considering the high requirements set by foreign clients, Beta has implemented a Quality Management System according to ISO 9001. Because of this, each year internal and external audits are conducted.

The presented paper shows the investigation of how it is possible to improve the audit process based on Beta organization. The audit was conducted at the headquarters and included various positions within the organization, as outlined in Table 1.

Table 1. *List of positions taking part in audits and surveys*

No	Position	Internal Audit	Online survey	External Audit
1	Signatory/representative	X	X	X
2	Operational Director	X	X	X
3	Quality Manager	X	X	X
4	Transport and Supply Department Manager	X	X	X
5	Logistics Department Manager	X	X	X
6	Movement Maintenance Department Employee	X	X	
7	Transport Department Employee	X	X	

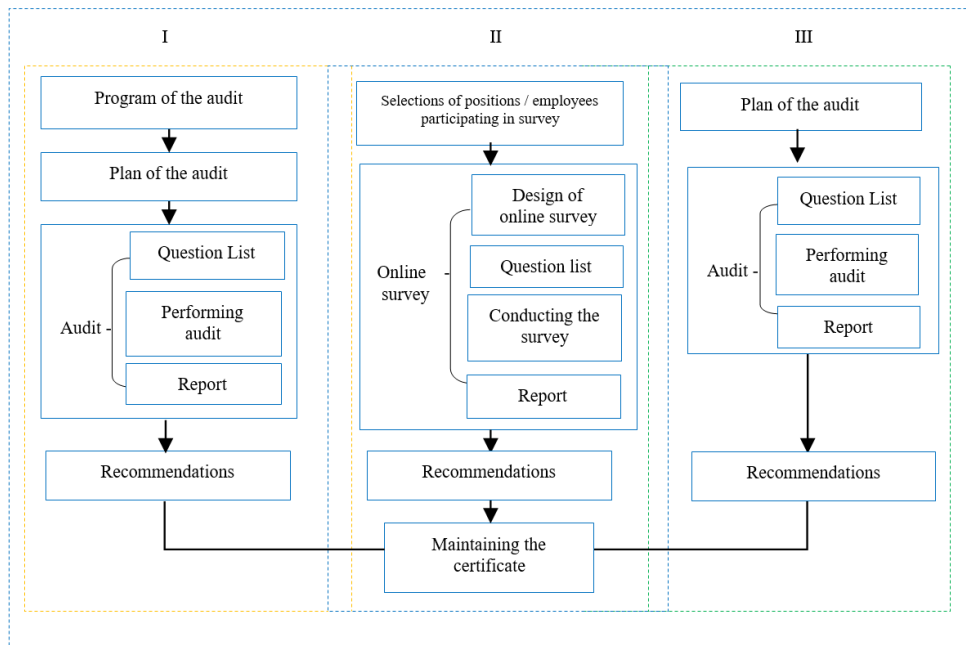
²The author of the paper does not receive acceptance to publish the name of the organization.

8	Transport Officer	X	X	X
9	Transport and Supply Department Manager Assistant	X	X	
10	Environmental Protection Specialist	X	X	
11	HR Officer	X	X	X

Source: Own study.

Key roles across various departments and levels were included to gather diverse perspectives. This approach ensured that the survey captured insights relevant to both operational and strategic processes (Table 1). For the first time in 2024, the audit process comprised three components: an internal audit, an online survey, and an external audit. This integrated approach provided a comprehensive assessment of organizational performance and compliance (Figure 2).

Figure 2. Use of Digital Survey During the Audit Process auditing management systems.



Source: Own study.

Based on this approach the organization established:

- Program of the audit - the Audit Program for the year 2024 was established at the end of 2023. The program encompasses the entire organization, covering all key process areas: management processes, core business processes, supporting processes, and external processes. The audits have been scheduled to take place between August and September 2024.
- Plan of the audit – seven days prior to each audit, detailed specifications

were prepared. These specifications included key information such as the relevant regulations, the owner of the specific process, the audit schedule, and the designated auditor.

The audits were conducted by an external company, with the auditor holding the qualifications of a Lead Auditor for ISO 9001. Based on the organization's specifications, three separate audit plans were developed:

- List of the questions – before conducting the audit, a tailored list of questions was created for each process being audited. This ensured a structured approach, focusing on specific aspects of each process. Preparing these questions in advance helped align the audit with organizational objectives and standards.
- Audit – the audit was conducted in accordance with the Audit Plan. The auditor posed questions, while the auditees provided responses and presented documented evidence to demonstrate conformity with the relevant standards.
- Report from the audit – it highlighted areas of conformity and identified any potential gaps or non-conformities. The findings provided a clear basis for improvement and ensured alignment with the standard's expectations.
- Based on the specification of the organizations 3 Plan of the audit, list of the questions and reports were established.

The second element based on the digital survey consisted from:

- Selections of positions / employees participating in survey - the selection of positions and employees participating in the survey was carefully planned to ensure a representative sample of the organization.
- Design of online survey – was conducted based on the Likert scale where:
 - ✓ Definitely no,
 - ✓ I do not think so,
 - ✓ Neither yes nor no,
 - ✓ I guess so,
 - ✓ Definitely yes.

Based on this approach the participant of the survey had the opportunity to give the answer dealing with fulfillment of the ISO 9001 standard. Question list – the questions were dealing with the particular points from the quality management standard (Table 2).

Table 2. *Number of the questions established in survey*

Standard ISO 9001	Number of Questions
Context of the organization	6
Leadership	2
Planning	5
Support	10
Operation	8
Performance, Evaluation	4
Improvement	2

Source: Own study.

Point 4, 'Context of the Organization,' was based on 6 questions. Point 5, 'Planning,' was addressed through 2 questions. Point 6, 'Support,' consisted of 5 questions. Point 7, 'Operations,' was covered by 8 questions. Point 8, 'Performance Evaluation,' included 4 questions. Finally, the last point, 'Improvement,' was assessed using 2 questions.

Conducting the survey – the survey was sent to all of the selectected employyes and managers. The time of conducting the survey was four weeks.

Report – Based on the survey results, the report was primarily presented through graphical charts, highlighting the perspectives of both employees and managers.

The last element which was conducted by certifications body consisted from:

- Plan of the audit – The audit was conducted one year after the establishment, providing information on the criteria used, the time frame, and the auditors involved.
- List of the questions - Prior to the audit, a customized set of questions was developed for each process being audited, ensuring a structured approach that addressed key aspects of each process. This preparation aligned the audit with organizational objectives and standards.
- Audit - The audit was carried out in alignment with the Audit Plan. The auditor asked questions, and the auditees responded, providing documented evidence to verify compliance with the relevant standards.
- Report from the audit – Based on the list of questions, the report was generated, highlighting strengths and potential areas for improvement identified during the audit.

All three elements have been completed and the recommendations have been presented to the management board, the quality manager, and the process owners. This revision provides clarity and corrects any grammatical issues. Would you like further refinements or adjustments.

4. Research Results

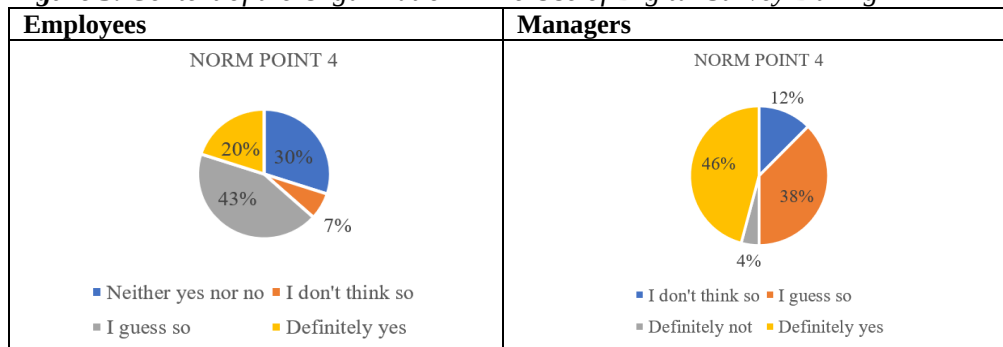
The research was conducted in three perspectives: internal audits, online survey and external audit. Following the internal audit, one nonconformity was identified, and three improvement actions were proposed to address the issue. The nonconformity and the improvement actions were thoroughly reviewed and resolved before the management review. These steps ensured that all concerns were addressed promptly, and corrective measures were implemented to enhance overall performance and compliance.

The second perspective focused on the use of an online survey to assess compliance with ISO 9001 standards. The survey was carefully designed using a Likert scale to

evaluate key aspects of the standard, such as leadership, planning, support, and improvement. By involving both employees and managers, the survey provided a balanced view of organizational performance and highlighted areas for improvement. The results, presented in graphical form, offered clear insights into how different levels of the organization perceived the fulfillment of quality management requirements. Two perspectives were analyzed: those of employees and managers. This approach underscored the importance of digital tools in efficiently capturing diverse viewpoints and providing a comprehensive understanding of organizational performance.

The first point, that was evaluated was Context of the organizations (point no 4 form the ISO 9001). In Figure 3, it is possible to notice the difference between Employees and Managers (Figure 3).

Figure 3. Context of the Organization - The Use of Digital Survey During



Source: Own study.

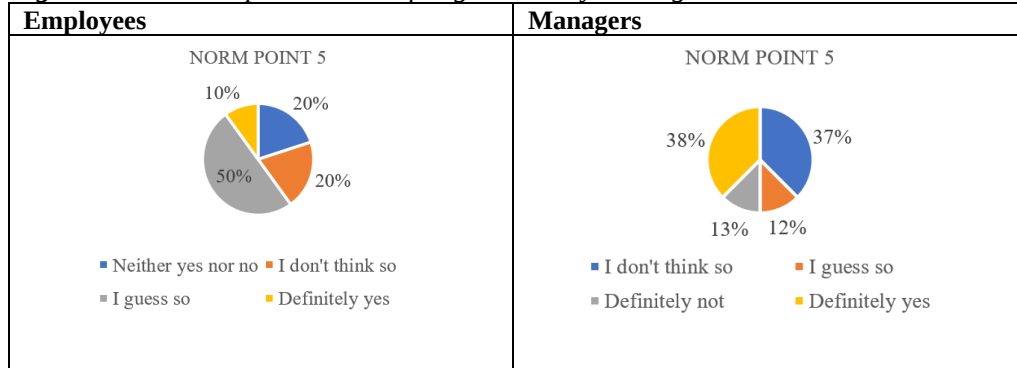
The evaluation of the "Context of the Organization" (ISO 9001 - Point 4) revealed a perception gap between employees and managers. While 46% of managers strongly agreed ("Definitely yes"), only 20% of employees felt the same, with 30% remaining neutral. This disparity highlights a need for improved communication and training to align understanding across organizational levels. Addressing these differences can enhance shared clarity and ensure a cohesive approach to meeting ISO 9001 requirements.

The evaluation of ISO 9001's Leadership (ISO 9001 – Point 5) revealed notable differences between employees and managers (Figure 4).

While 38% of managers strongly agreed on leadership's effectiveness, 37% disagreed, showing mixed confidence within leadership itself. Among employees, 50% moderately agreed, but 20% expressed uncertainty, and another 20% disagreed. These results highlight a gap in perception and suggest a need for stronger communication, visibility, and alignment of leadership efforts with ISO 9001 principles across the organization.

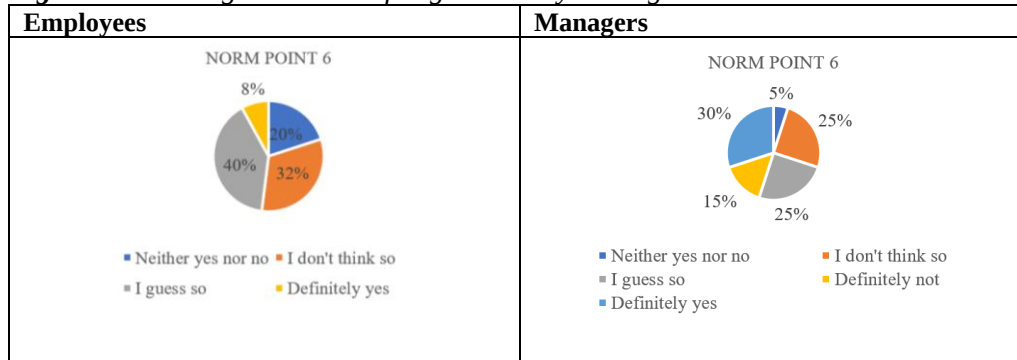
The results for ISO 9001's Planning reveal rather small confidence in the organization's planning processes from both employees and managers (Figure 5).

Figure 4. Leadership – The Use of Digital Survey During



Source: Own study.

Figure 5. Planning – The Use of Digital Survey During



Source: Own study.

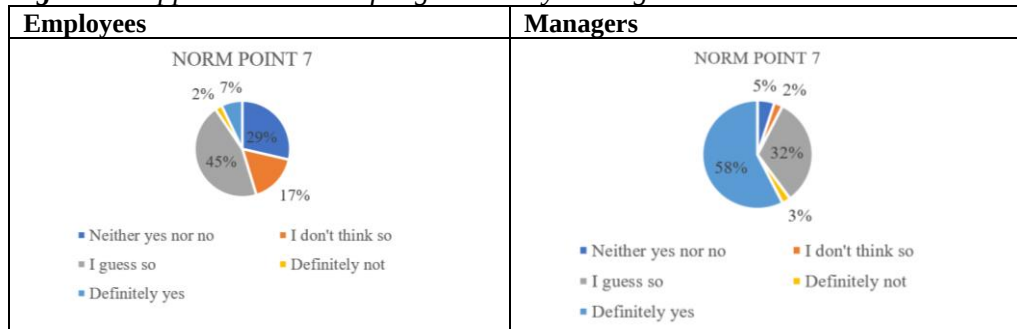
Among employees, 40% moderately agreed ("I guess so"), while 32% disagreed ("I do not think so"), and only 8% strongly agreed ("Definitely yes"), indicating uncertainty and mixed perceptions. Managers expressed even less confidence, with 30% neutral, 25% disagreeing, and 15% strongly disagreeing. These results suggest significant room for improvement in planning processes, with a need for clearer communication and alignment to ensure planning meets ISO 9001 standards.

The results for the Support criterion in ISO 9001 show a significant difference in perception between employees and managers (Figure 6).

Among employees, 45% moderately agreed ("I guess so"), while 29% were neutral, and only 7% strongly agreed ("Definitely yes"). In contrast, 58% of managers strongly agreed, showing high confidence in the organization's support mechanisms. However, 15% of managers strongly disagreed, highlighting some internal concerns.

These results suggest a need to address employee uncertainty and dissatisfaction with support systems to align their perspectives more closely with management's confidence.

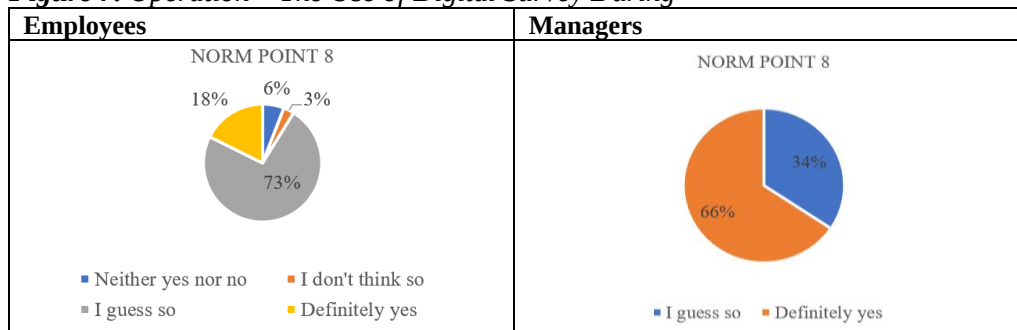
Figure 6. Support – The Use of Digital Survey During



Source: Own study.

The evaluation of ISO 9001's Operations point revealed a significant contrast between employees and managers (Figure 7).

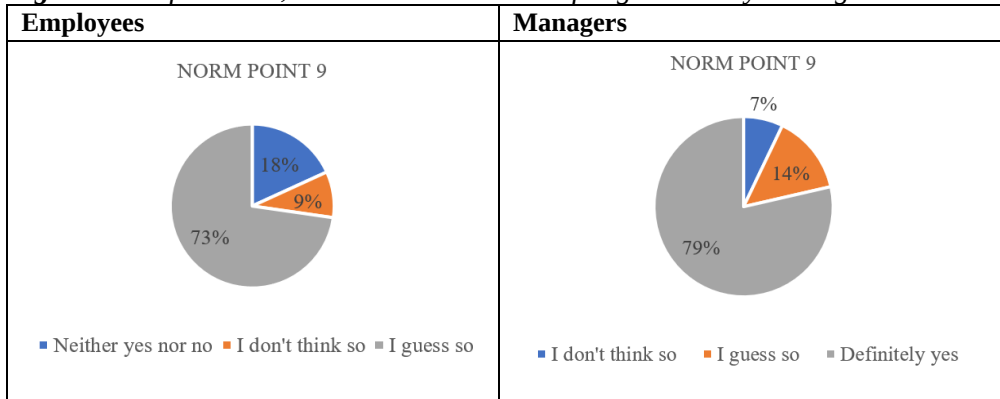
Figure 7. Operation – The Use of Digital Survey During



Source: Own study.

Among employees, 73% moderately agreed ("I guess so"), while only 18% strongly agreed ("Definitely yes"), suggesting general confidence but some uncertainty. In contrast, 66% of managers strongly agreed, reflecting higher confidence in operational alignment with ISO 9001 standards.

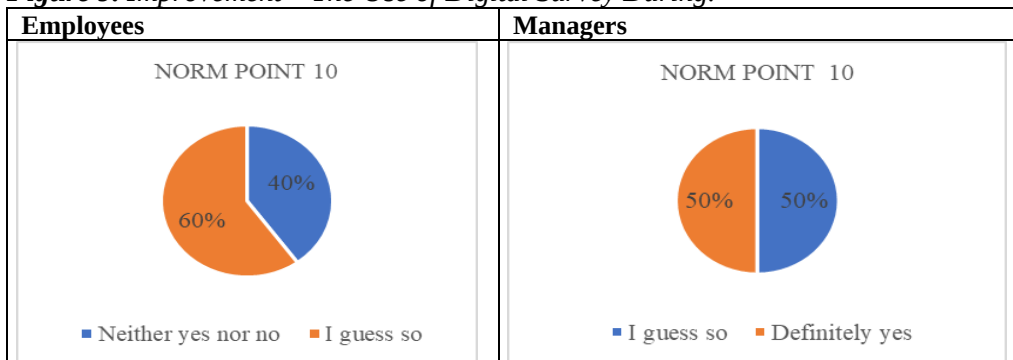
These results indicate a need for clearer communication and involvement of employees to strengthen their understanding and confidence in operational processes. The results for Performance and Evaluation reveal a strong contrast between employees and managers (Figure 8).

Figure 8. Performance, Evaluation – The Use of Digital Survey During

Source: Own study.

Among managers, 79% strongly agreed ("Definitely yes") that performance evaluation aligns with ISO 9001 requirements, while only 14% moderately agreed, and 7% disagreed. In contrast, 73% of employees moderately agreed ("I guess so"), with 18% expressing uncertainty and 9% disagreeing. This indicates that while managers are confident in the organization's performance evaluation practices, employees perceive them with less clarity, suggesting a need for better communication and involvement to align understanding and engagement across levels.

The results for Continuous Improvement (ISO 9001 - Point 10) show contrasting levels of confidence between employees and managers (Figure 9).

Figure 9. Improvement – The Use of Digital Survey During.

Source: Own study.

Among employees, 60% moderately agreed ("I guess so"), and 40% remained neutral, indicating uncertainty or limited awareness of improvement initiatives. In contrast, managers displayed higher confidence, with 50% strongly agreeing ("Definitely yes") and 50% moderately agreeing. This suggests that while leadership

is confident in the organization's continuous improvement efforts, employees may require better communication or engagement to fully recognize and support these initiatives.

The final stage of the audit process was an external audit conducted by a certification body. This audit revealed no non-conformities but identified three areas for potential improvement. As a result, Beta successfully maintained its ISO 9001 certification, demonstrating its commitment to quality standards and continuous improvement.

This achievement underscores Beta's dedication to sustainable development, as maintaining ISO 9001 certification not only ensures product and service quality but also supports efficient resource utilization and responsible business practices. By addressing areas for improvement, Beta can further align its operations with sustainability goals, reducing environmental impact and contributing to long-term economic and social well-being.

5. Discussion

The findings of the study demonstrate the effectiveness of a comprehensive audit approach, combining internal audits, digital surveys, and external audits, in evaluating and improving the quality management system (QMS) in accordance with ISO 9001 standards. This discussion focuses on the implications of the results, the identified gaps, their broader relevance to quality management practices and sustainable development.

- Digital surveys proved to be a cost-effective and efficient tool for collecting diverse perspectives across organizational levels. They facilitated a structured assessment of ISO 9001 criteria, highlighting differences in perception between employees and managers.
- The results revealed notable perception differences between employees and managers across key ISO 9001 points, such as leadership, planning, and continuous improvement. For example, while managers demonstrated high confidence in certain areas, employees often exhibited uncertainty or moderate agreement.
- Internal audits and surveys offered valuable insights, enabling the resolution of non-conformities and the implementation of proactive improvement measures, ultimately ensuring a successful external audit with no non-conformities identified.
- Digital surveys play a critical role in the sustainable development of

organizations by enabling efficient, scalable, and environmentally friendly data collection processes. By replacing paper-based surveys, they reduce waste and lower the carbon footprint associated with traditional methods. Additionally, digital surveys facilitate the inclusion of diverse stakeholder perspectives, promoting a culture of transparency, collaboration, and continuous improvement. These insights empower organizations to address gaps in leadership, planning, and operational practices, aligning them with sustainability goals such as resource efficiency, social responsibility, and long-term resilience

6. Limitation of the Study

The study was conducted within a single organization in the recycling industry, with a focus on quality management standards outlined in ISO 9001. The research sample comprised 11 participants, including 5 managerial staff and 6 employees representing various organizational processes. While the study acknowledges certain limitations, the author contends that the methodologies and findings are broadly applicable to organizations across different sectors. The proposed approaches are designed to be effective regardless of an organization's size, workforce composition, or industry type.

7. Conclusions

This study demonstrated that digital tools can effectively support and enhance the audit process in quality management systems, addressing the research questions as follows:

Effectiveness of Digital Tools (Q1): The findings confirm that digital surveys are a cost-effective and efficient method for enhancing the audit process. They allow organizations to systematically evaluate compliance with ISO 9001 standards, identify non-conformities, and gather actionable insights. By leveraging digital tools, the organization successfully resolved issues and implemented improvement measures, contributing to a seamless external audit.

Broadening Participation (Q2): Digital tools enabled the involvement of a diverse range of participants, including employees and managers from various departments, beyond the traditional process owner. This inclusivity provided a more comprehensive understanding of organizational performance and highlighted differing perspectives. The approach emphasized the value of engaging all organizational levels in the audit process to foster alignment and shared accountability for quality management.

Challenges of Digital Surveys (Q3): While digital surveys proved effective, the study identified certain limitations, including potential issues with data security, the need for thorough preparation of survey questions, and the challenge of ensuring

respondent engagement. These challenges highlight the importance of designing robust digital audit tools with clear communication, secure data handling practices, and user-friendly interfaces.

In conclusion, digital tools offer significant potential to improve the effectiveness and inclusivity of quality management audits. By addressing identified challenges and expanding their use, organizations can enhance compliance, reduce costs, foster a culture of continuous improvement and sustainable development. Future research could explore integrating advanced technologies, such as artificial intelligence, to further optimize the audit process and broaden its applicability.

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