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QUALITY AUDITS AS TOOLS FOR IMPROVING PRODUCTION PROCESSES IN MANUFACTURING ENTERPRISES

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Abstract. The aim of this article is to identify and assess the role of quality audits in improving production processes in selected manufacturing enterprises located in south-eastern Poland. The analysis is embedded in the concept of Total Quality Management, which treats quality as the result of customer orientation, employee involvement, a process approach, and continuous improvement. The study was conducted using a methodology based on direct observation, analysis of internal documentation. The qualitative material was then compared with the results of a survey of 40 respondents with experience in audit practice in manufacturing enterprises, thereby enabling triangulation of the findings. The analysis covered three audit practices: 6S audit, final audit, and product audit. The results indicate that quality audits serve functions that go beyond formal conformity assessment, supporting process stabilisation, the identification of nonconformities, the initiation of corrective actions, and the strengthening of responsibility for quality. The survey data confirmed the particular importance of audits for process standardisation and discipline, nonconformity prevention, and work organisation, while also revealing barriers such as limited time, employee resistance, data quality issues, and fragmented IT systems.

Keywords: quality audit; quality management; process improvement; manufacturing enterprises

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1. Introduction and review of literature

In contemporary markets, the concept of quality is no longer regarded exclusively as a set of technical product characteristics or as the outcome of final inspection. Manufacturing enterprises increasingly view quality not only as a set of a product's technical characteristics or as the result of final inspection. It is more often treated as an element that co-creates competitiveness, operational efficiency, and the organisation's capacity for long-term development (Kaynak, 2003; Phan et al., 2011; Oakland, 2014; Titu et al., 2025). This perspective is consistent with both the classical literature on quality management and the normative approach developed within the ISO 9000 family, which is oriented toward meeting customer expectations and improving the quality of products and services (PN-EN ISO 9000:2015-10; Afzal et al., 2025).

In classical concepts, quality was understood not only as technical conformity but also as usefulness and value from the recipient's perspective. Juran and Godfrey (1998) defined it as "fitness for use" whereas Crosby (1979) emphasised the economic dimension of pro-quality activities, stating that "quality is free". Both approaches remain relevant because they link quality with the ability to meet customer expectations, prevent failures, and reduce the costs resulting from nonconformities. In contemporary manufacturing, quality is therefore

increasingly understood as the outcome of process capability, organisational decisions, employee involvement, and the systematic prevention of errors rather than merely the result of final product inspection. This broader understanding of quality is reflected in the concept of Total Quality Management. TQM is not a single method or a set of separate tools, but a comprehensive approach that integrates organisational activities around quality (Oakland, 2014; Carnerud & Bäckström, 2021; Rakyta et al., 2024; Sravanthi et al., 2025).

Ali (2024), in a bibliometric review of research on TQM in manufacturing firms, concluded that TQM remains an active and evolving research field rather than a declining management concept. The review also identified a need for further research in emerging and developing economies and for the integration of established quality management practices with contemporary technological and organisational conditions. Therefore, classical TQM principles continue to provide an appropriate theoretical framework for examining quality practices in manufacturing enterprises, although their implementation increasingly takes place in an environment shaped by digitalisation, data integration, and Industry 4.0.

It includes customer orientation, leadership, employee involvement, a process approach, and improvement based on data and organisational learning to maintain quality (American Society for Quality, 2024; Kaynak, 2003; Phan et al., 2011). Empirical studies indicate that quality management practices and ISO 9001-based solutions can support the operational performance of manufacturing enterprises, including productivity, product quality, customer satisfaction, and process stability (Kaynak, 2003; Phan et al., 2011; Nurcahyo et al., 2021). At the same time, the positive impact of a quality system depends not only on its formal implementation but also on the actual use of procedures and data, and the development of a quality culture (Bakhtiar et al., 2023; Ayyadi & Oulhadj, 2024; Setyaningrum et al., 2025).

The distinction between formal compliance and operational use is important. Gremyr et al. (2021) investigated how different ways of using quality management systems affect managerial perceptions of their cost, strategic importance, and value. Their findings showed that a compliance-oriented use of QMS, focused mainly on documentation, was more likely to be perceived as costly and of limited value. By contrast, the use of QMS as a tool for business management and improvement strengthened its perceived strategic relevance. Bakhtiar et al. (2023) similarly indicated that the influence of ISO 9001 on operational performance depends on the functioning of interconnected system elements, including leadership, planning, operational control, performance evaluation, and improvement. Consequently, certification or the formal existence of procedures alone cannot be treated as evidence that a quality management system creates operational value.

Recent research also places quality management within the context of technological transformation. Fadilasari et al. (2024) examined the challenges associated with adopting quality management practices in the Industry 4.0 era. Their study draws attention to barriers related to technological integration, organisational readiness, employee competencies, and the adaptation of established quality practices to digitally supported production systems (Liu et al., 2023). From the perspective of the present article, these developments are relevant because they increase the importance of reliable data, timely feedback, and the integration of quality information with operational decision-making. They do not, however, eliminate the importance of established quality practices. Instead, they create a need to reconsider how traditional quality management tools, including audits, can support improvement in increasingly data-intensive manufacturing environments.

Quality audits occupy a particular place among the tools used in quality management systems. ISO 19011 constitutes the basic normative reference for management system audits by defining the principles of auditing, the management of audit programmes, and the conduct of management system audits (PN-EN ISO 19011:2018-08). Audits provide systematic and documented evidence concerning the extent to which audit criteria are fulfilled. In manufacturing enterprises, however, their potential role extends beyond confirming compliance. Audit findings can support process supervision, reveal recurring nonconformities, provide information about weaknesses in organisational practices, and initiate corrective and improvement actions (Abuazza et al., 2020; Helmold & Terry, 2021). Research concerning the organisational value of quality management systems confirms the importance of this broader use of audit information. Gremyr et al. (2021) distinguished between compliance-oriented, improvement-oriented, and business-management-oriented uses of QMS, indicating that standardisation can create value but excessive emphasis on documentation may reduce the system's managerial

relevance. Camango and Cândido (2023), in a systematic review of ISO 9001 maintenance, decertification, and recertification, showed that maintaining a functioning quality management system requires continuous monitoring, management involvement, improvement activities, and internal audits. Their findings suggest that audits should be considered part of the ongoing maintenance and development of QMS rather than an activity performed only for certification purposes. The role of internal audits was examined more directly by Lenning and Gremyr (2022), who reviewed the literature and developed a research agenda concerning their potential. The authors showed that internal audits may support control, learning, and organisational improvement, but the empirical understanding of how this value is generated remains fragmented. They also indicated that more research is needed on audit processes that go beyond the verification of compliance and provide information relevant to management and improvement. This observation is particularly important in manufacturing enterprises, where audits may be embedded at different points in the production process and may differ considerably in their subject, scope, participants, and consequences.

The development of digital manufacturing introduces an additional, emerging dimension of audit practice. Mayer et al. (2024) proposed a procedure for assessing data quality in smart manufacturing and demonstrated how an ISO-aligned, structured audit process could produce recommendations for improving the use of manufacturing data. Although their study focused on data quality rather than conventional product or workplace audits, it illustrates the broader tendency to connect auditing with digital information flows and operational decision support. This development reinforces the need to understand the organisational mechanisms through which audit findings are translated into corrective and improvement actions.

Despite the extensive literature on TQM, ISO 9001, and the relationship between quality management and organisational performance, the practical functioning of specific quality audits within the everyday course of production remains less thoroughly examined. Earlier empirical studies have primarily investigated general relationships between bundles of quality management practices and performance outcomes (Samson & Terziovski, 1999; Kaynak, 2003; Phan et al., 2011). More recent research has examined the operational effects of ISO 9001, different uses of QMS, the maintenance of certification, and challenges associated with Quality 4.0 (Gremyr et al., 2021; Lenning & Gremyr, 2022; Bakhtiar et al., 2023; Camango & Cândido, 2023; Fadilasari et al., 2024). However, these studies provide limited insight into how different audit practices are embedded at particular stages of manufacturing processes and how they support workplace organisation, final conformity assurance, process diagnosis, and corrective action.

Consequently, the research gap addressed in this article does not concern the general effectiveness of TQM or ISO 9001. Instead, it concerns the limited empirical understanding of how different types of quality audits operate as complementary mechanisms within manufacturing enterprises. In particular, further investigation is needed into how audit practices situated at different points in the production process contribute to process stabilisation, nonconformity detection, feedback generation, corrective action, and the practical implementation of TQM principles (Helmold & Terry, 2021; Lenning & Gremyr, 2022). An additional justification for undertaking the study is the limited number of in-depth analyses of the functioning of such solutions within the specific organisational and regional context of Polish manufacturing enterprises.

The identified research gap justifies an analysis of the practical use of quality audits in manufacturing enterprises operating in south-eastern Poland. The aim of the article is to identify and assess the role of quality audits in improving production processes in selected enterprises, with particular emphasis on their significance for detecting nonconformities, stabilising processes, initiating corrective actions, and supporting the assumptions of Total Quality Management. The analysis focuses on three audit practices: 6S audit, final audit, and product audit which represent different locations and functions within the production and quality management system.

2. Quality audit in theoretical perspective

A quality audit is a basic tool in quality management systems for the systematic assessment of processes, activities, and organisational solutions. Its main reference is ISO 19011, which organises the principles for planning, conducting, documenting, and evaluating management system audits. The standard applies to first-, second-, and third-party audits and requires them to be conducted in an orderly, documented manner based on objective evidence (PN-EN ISO 19011:2018-08).

In practical terms, an audit may be understood as an organised process of collecting and analysing information concerning the conformity of specific activities with adopted criteria. It includes, among other things, a review of documentation, direct observations, analysis of process data, and the formulation of conclusions and recommendations for corrective actions (Wolniak, 2021). One of its basic functions is therefore conformity assessment, that is, checking whether processes, procedures, activities, and results meet the requirements of standards, regulations, customer specifications, and the organisation's internal standards. In this sense, an audit serves an evidential and verification function, enabling the determination of whether the quality management system operates in accordance with the adopted assumptions (PN-EN ISO 19011:2018-08; Helmold & Terry, 2021; Hariyani et al., 2025).

However, conformity assessment does not exhaust the meaning of a quality audit. An effectively conducted audit should provide information useful to management: it enables not only the confirmation of the fulfilment of specific requirements, but also the identification of areas requiring improvement, possible causes of problems, and risks affecting process effectiveness. In this approach, an audit becomes a source of knowledge about the functioning of the organisation and a basis for undertaking corrective and improvement actions (PN-EN ISO 19011:2018-08; Helmold & Terry, 2021; Wolniak, 2021; Lenning & Gremyr, 2022; Schweers et al., 2024).

In manufacturing enterprises, the significance of an audit is particularly evident where quality depends on process stability, parameter repeatability, and the organisation's ability to respond quickly to deviations. An audit may then serve as a preventive mechanism that limits the risk of passing a nonconforming product to subsequent stages of the process, as well as a diagnostic tool that enables the identification of problem sources and directions for corrective actions. Its value, therefore, results not only from the fact that an assessment has been conducted, but above all from the quality of the information obtained and the way it is used in organisational practice (Helmold & Terry, 2021; Lenning & Gremyr, 2022; Leosdottir et al., 2025).

From this perspective, a quality audit can be seen as a tool that links system requirements with day-to-day process management. It helps organise the flow of information, identify weak points in the system, support decisions concerning corrective actions, and assess the effectiveness of implemented solutions. In this sense, an audit is part of the logic of continuous improvement, as it enables the results of assessment to be transformed into concrete organisational actions (Oakland, 2014; Gremyr et al., 2021; Dandekar et al. 2026).

The significance of quality audits can also be considered in relation to the assumptions of Total Quality Management. In the TQM model, quality is not the responsibility only of the inspection department or the management system representative, but becomes a matter of joint action by the entire organisation. The audit occupies a special place in this arrangement because it combines process assessment with the generation of knowledge needed for improvement. It may support customer orientation, the process approach, continuous improvement, and the development of shared responsibility for quality, provided that its results are used for development rather than merely for formal purposes (Hawkes & Adams, 1995; Kaynak, 2003; Oakland, 2014; American Society for Quality, 2024).

As a result, a quality audit should be perceived as a multifunctional tool. It enables the conformity of activities with the requirements to be assessed, while also making it possible to recognise system weaknesses, initiate corrective actions, strengthen the flow of information, and develop a culture of continuous improvement. Its role in the quality management system is therefore not merely auxiliary. An audit is one of the practical links connecting quality requirements, process responsibility, and lasting organisational improvement (Oakland, 2014; Helmold & Terry, 2021; Lenning & Gremyr, 2022).

3. Research methodology

The core of the study was a qualitative case study of three enterprises, while the survey was treated as a supporting component, enabling the findings from the three organisations to be compared with a broader picture

of audit practice in manufacturing enterprises. This approach made it possible to combine an in-depth description of organisational mechanisms with a synthetic assessment of the frequency of selected phenomena.

The adopted qualitative strategy was a multiple case study. The choice of this strategy resulted from the need to analyse quality audits in their natural organisational context and from the intention to capture similarities and differences between the studied enterprises. The qualitative sample consisted of three manufacturing enterprises operating in south-eastern Poland and applying quality management solutions. Due to data confidentiality, the names of the organisations studied were anonymised and designated as Enterprise A, Enterprise B, and Enterprise C.

The qualitative research was conducted between October 2024 and April 2025. In the first stage, 14 manufacturing enterprises that use quality management systems were identified and contacted with inquiries about the possibility of conducting research. Responses were received from 4 organisations, while 3 enterprises agreed to participate in the study and provide empirical material. In the next stage, the production processes of the studied organisations were initially examined, and the scope of observation and documentation analysis was specified (see Table 1).

The empirical material was based on three mutually complementary sources of data: internal documentation, direct observations, and survey among employees. Document analysis made it possible to identify the formal assumptions of quality management systems, the audit procedures used, and the manner in which nonconformities and corrective actions are documented. Observations enabled these records to be related to the actual course of selected production processes and quality supervision practices.

Table 1. Characteristics of the studied enterprises and data sources used in the case studies

Studied enterprise	Enterprise profile	Data sources	Management systems/standards
Enterprise A	Large manufacturing enterprise from the interior and office furnishing sector, with an integrated management system.	Quality and system documentation; observation of audited workstations	ISO 9001, ISO 14001, ISO 14006, ISO 45001, and selected sectoral and environmental standards.
Enterprise B	Manufacturing enterprise operating in advanced industrial production, including sectors with increased quality requirements.	Quality documentation and audit records; observation of final inspection, production, and process supervision.	AS/EN 9100, ISO 9001, ISO 14001, and requirements specific to specialised production.
Enterprise C	Large automotive manufacturing enterprise with a developed quality supervision system.	Audit procedures, measurement reports, and action plans; observation of production processes, production, and post-audit actions	IATF 16949, ISO 14001, ISO 45001.

Source: own elaboration

The quantitative component took the form of a diagnostic survey. The questionnaire included questions concerning the types of audits used, their frequency, objectives, assessed effectiveness, implementation barriers, digitalisation maturity, response time to nonconformities, use of data for improvement, and the role of leaders in the audit process. The survey included both single-choice questions and multiple-choice TOP3 questions. A total of 40 responses were obtained.

The analysis of the empirical material was oriented toward answering the question: how do quality audits support the improvement of production processes and the implementation of Total Quality Management assumptions? In the qualitative part, the focus was on three types of audit solutions: 6S audits, final audits, and product audits. In the survey section, the analysis examined which audit functions were most frequently cited by respondents and which barriers limited their effectiveness.

The advantage of the adopted methodology is the ability to capture quality audits both in an in-depth organisational context and from the broader perspective of respondents' opinions. The study's limitation remains the purposive, non-representative nature of the sample selection; therefore, the survey results should not be used

as a basis for statistical generalisation. Its role was to supplement the qualitative material rather than to replace the in-depth case analysis.

4. Research results

4.1. Enterprise A

In Enterprise A, the use of 6S audits was identified as a tool supporting the organisation of workstations, the maintenance of operational standards, and the development of a quality culture. The 6S audit represented an extension of the classical 5S concept with an additional safety element, which gave it both an organisational and preventive dimension. The analysis of the empirical material indicates that these audits were carried out cyclically, once a month, and served to assess the conformity of production workstations with adopted standards.

The 6S system covered six areas: sort, set in order, shine, standardise, sustain, and safety. Each of these elements was assessed according to defined criteria, and the audit itself was conducted with the participation of the lead auditor, the employee of a given workstation, a supervisor, and an employee from another area of the organisation. This method of conducting the audit strengthened the multi-aspect nature of the assessment, limited the risk of a one-sided interpretation of results, and supported the development of a shared understanding of quality standards.

The results of the analysis indicate that in Enterprise A, the 6S audit was not limited to assessing order and work organisation. It was also a tool that systematised everyday operational practice, supported workplace discipline, maintained the repeatability of activities, and increased employees' quality awareness. As a result, it strengthened organisational order and operational prevention, fitting into the assumptions of TQM by combining standardisation, employee involvement, safety, and continuous improvement (Kaynak, 2003; Oakland, 2014; Ali, 2024).

4.2. Enterprise B

In Enterprise B, the key identified solution was the final audit, carried out as a form of final inspection of the product before it was passed on to subsequent stages of the process or to the customer. The analysis of the empirical material shows that it functioned as a boundary point in the production process: it made it possible to detect nonconformities at the final stage, reduced the risk of passing a defective component or finished product further along the value chain, and reduced the potential costs of complaints, repairs, and reputational loss. At the same time, the regular collection of data from final audits enabled the identification of problem sources and provided feedback to the engineering, technological, and production departments. This approach is consistent with the understanding of an audit as both a tool for conformity assessment and a support for improvement activities (PN-EN ISO 19011:2018-08; Helmold & Terry, 2021).

The research results also indicate that the final audit supported the enterprise's operational stability. The systematic use of this tool helped maintain process repeatability, increase quality predictability, and strengthen the organisation's ability to manage quality risk. In this sense, the final audit served not only a verification function but also diagnostic and improvement functions, as it generated knowledge about sources of error and supported the undertaking of corrective actions (Helmold & Terry, 2021; PN-EN ISO 19011:2018-08; Oakland, 2014).

4.3. Enterprise C

In Enterprise C, the practice of product audits was identified. These audits were carried out according to an established schedule and on the basis of precisely defined procedures. Compared with the two other solutions, this audit had the most developed process-diagnostic character, as it enabled assessment of product conformity in connection with the coherence of the entire manufacturing process. Such an approach corresponds with literature emphasising the value of an audit as a tool supporting quality management and process improvement (Helmold & Terry, 2021; Lenning & Gremyr, 2022).

An important feature of this solution was its strong embedding in customer requirements and precisely defined assessment criteria. The product audit enabled monitoring of the extent to which quality requirements were met,

including for products with high technical complexity. The use of requirement matrices, measurement reports, and documentation of corrective actions increased process transparency and facilitated the identification of quality trends.

Audit results were linked to risk assessment, error classification, and formal documentation of further actions. When a nonconformity was identified, corrective and corrective actions were defined, responsibilities were assigned, and a completion deadline not exceeding two weeks was set. The scope of response could include, among other things, retesting, selection, suspension of production or shipments, conditional approval, or recurrence-related actions. The entire process was documented in an action plan, and the effectiveness of the implemented solutions was then assessed. This logic aligns with the understanding of an audit as an element of the continuous improvement loop, in which the assessment result serves as the basis for corrective actions and organisational learning (PN-EN ISO 19011:2018-08; Gremyr et al., 2021).

The product audit also had a strong cross-functional dimension. Various organisational units were involved in its implementation, from design and process engineering to logistics and quality management. This arrangement supported the building of shared responsibility for quality, increased the coherence of actions, and shortened the response time to nonconformities, which fits well with the logic of TQM, emphasising the process approach, employee involvement, and shared responsibility for quality (Oakland, 2014; Mohammed & Panchal, 2026).

From an organisational perspective, the product audit helped maintain process repeatability, stabilise production parameters, and reduce the number of deviations. Therefore, it can be stated that in Enterprise C, it performed the most developed systemic function among the analysed solutions, combining conformity assessment, analysis of problem causes, and the initiation of improvement in many areas of the organisation simultaneously (Helmold & Terry, 2021; Lenning & Gremyr, 2022).

4.4. Comparison of audit functions in the studied enterprises

The conducted analysis indicates that all three identified audit practices supported quality management, although each was embedded at a different level of organisational functioning. The 6S audit in Enterprise A focused primarily on workstation organisation, operational discipline, and the development of a quality culture. The final audit in Enterprise B served as a final process safeguard, strengthening the organisation's ability to identify nonconformities before the product was passed on. The product audit in Enterprise C was the most comprehensive and process-oriented, as it allowed quality to be assessed in relation to customer requirements, the process course, corrective actions, and the effectiveness of the organisational response.

The common denominator of the analysed solutions was that they did not perform only a control function. Each audit generated information used to undertake corrective actions, organise the process, and strengthen employees' quality awareness. The differences concerned mainly their objectives and roles in the production process: the 6S audit strengthened the organisational conditions for quality, the final audit protected the process output, and the product audit enabled an in-depth assessment of process and product quality. This means that in the studied enterprises, audits formed a complementary set of tools: from stabilising the work environment, through final inspection, to diagnosing and improving the manufacturing process (PN-EN ISO 19011:2018-08; Oakland, 2014; Kaynak, 2003; Helmold & Terry, 2021).

The results obtained, therefore, indicate that quality audits can support the practical implementation of TQM assumptions, especially in the areas of continuous improvement, the process approach, and shared responsibility for quality. The interpretation of these findings in the light of the literature is presented in the discussion section.

4.5. Survey results as a complement to the case studies

The survey enabled comparison of the conclusions from the case studies with the opinions of respondents with experience in audit practice in manufacturing enterprises.

The results indicate that audit practice is diverse. The most frequently used were process or internal audit, OHS audit, and 6S audit, which shows that audits include both activities aimed at system conformity and solutions directly related to work organisation, safety, and ongoing process supervision (Table 2).

Table 2. Types of audits used in the studied enterprises according to respondents (multiple choice) (n = 40)

Type of audit	Number of indications	Share of respondents
Process/internal audit	25	62.5%
OHS audit	23	57.5%
6S audit	20	50.0%
ISO/system audit	17	42.5%
Final audit	11	27.5%
Product audit	10	25.0%
Other types of audit	2	5.0%

Source: own elaboration

The frequency of audits indicates that, in the studied organisations, they are not treated as a periodic form of control but as a permanent element of process management (Figure 1).

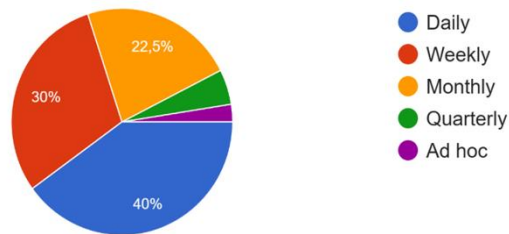


Figure 1. Frequency of conducting audits in the studied enterprises (n = 40)

Source: own elaboration

The largest group of respondents declared that audits were conducted daily, followed by weekly and monthly. This distribution of responses confirms their embedding in ongoing operational practice and their importance for systematic process monitoring (Figure 2).

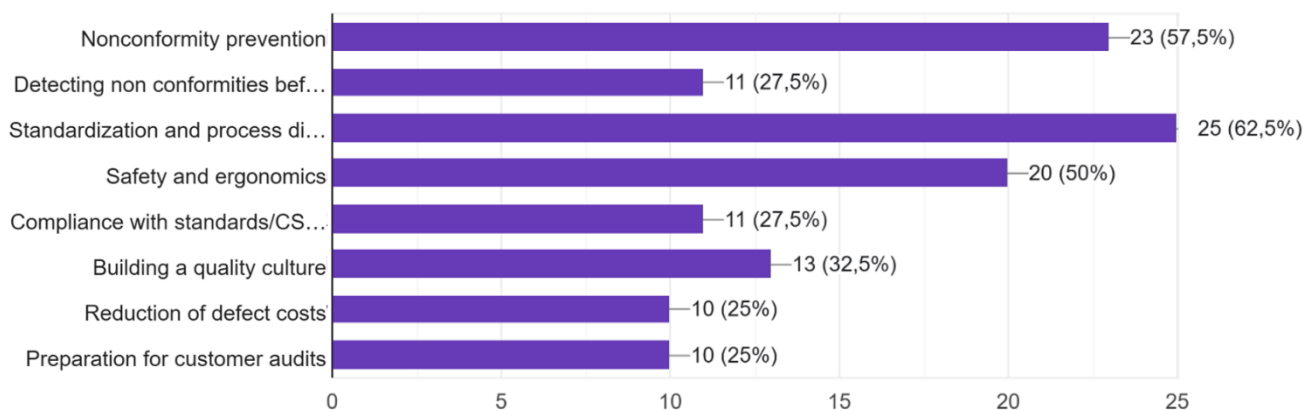


Figure 2. Main goals of audits according to respondents (multiple choice) (n = 40)

Source: own elaboration.

Respondents most often indicated that the main goals of audits were process standardisation and discipline, nonconformity prevention, safety, and ergonomics. These answers are consistent with the conclusions from the

case studies, which show that audits serve not only a control function but also support preventive actions, improve safety, and shape a more orderly and conscious organisational practice (Figure 3).

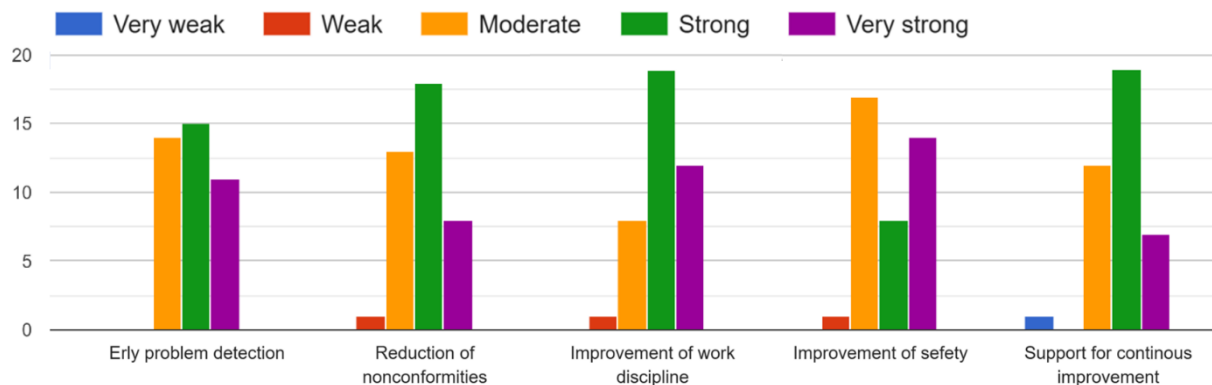


Figure 3. Assessment of audit effectiveness in the opinion of management staff (n = 40)

Source: own elaboration

The assessment of audit effectiveness was generally positive, though it varied by dimension analysed. The highest assessment concerned the impact of audits on improving work discipline. Their importance for early problem detection, reduction of nonconformities, and support for continuous improvement was also highly assessed. The impact of audits on safety was assessed as slightly lower, although still positive. These results indicate that respondents perceive the operational and improvement-oriented dimension of audits.

Table 3. Main barriers limiting audit effectiveness according to respondents (multiple choice) (n = 40)

Barrier limiting audit effectiveness	Number of indications	Share of respondents
Lack of time and resources	35	87.5%
Employee resistance	18	45.0%
Poor data quality / manual entries	17	42.5%
Fragmented IT systems	15	37.5%
Insufficient leadership involvement	12	30.0%

Source: own elaboration

The most frequently cited barrier to audit effectiveness was a lack of time and resources (see Table 3 above). Employee resistance, poor data quality or manual entries, and fragmented IT systems were also relatively frequent. This means that audit effectiveness depends not only on the existence of an audit procedure itself, but also on information quality, organisational conditions, and the enterprise's ability to consistently use audit results.

Table 4. Audit digitalization maturity according to respondents (n = 40)

Audit digitalization maturity	Number of indications	Share of respondents
Fully digitalized process	13	32.5%
Hybrid process	13	32.5%
Partially digitalized process	8	20.0%
Paper-based process	6	15.0%

Source: own elaboration

The results concerning digitalisation show that the studied organisations use digitalised, hybrid, and paper-based solutions (see Table 4 above). The level of digitalisation of the audit process is therefore diverse, which may affect data quality, the speed of information flow, and the effectiveness of post-audit actions.

From the perspective of using audit results, the response time to nonconformities is also important (Table 5 below).

Table 5. Response time to nonconformities after an audit according to respondents (n = 40)

Response time to nonconformities after an audit	Number of indications	Share of respondents
Immediately	9	22.5%
Less than 24 hours	12	30.0%
From 2 to 7 days	15	37.5%
More than 7 days	4	10.0%

Source: own elaboration

Some respondents indicated an immediate response or a response within 24 hours, but a significant group reported a response within 2 to 7 days. This may mean that the mere detection of a nonconformity does not always lead to the rapid initiation of corrective actions.

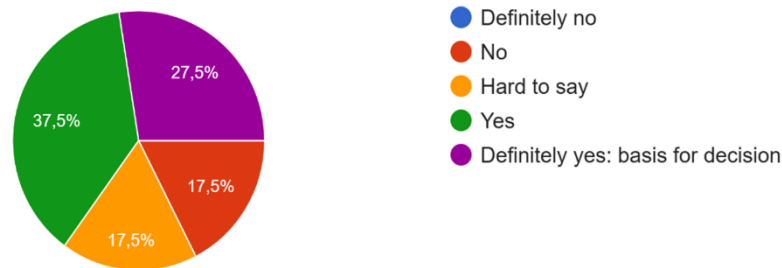


Figure 4. Audits as a source of data for process improvement according to respondents (n = 40)

Source: own elaboration

The survey results also confirm that audits can generate data used to improve processes (Figure 4 above). Most respondents indicated “yes” or “definitely yes”, which confirms their managerial value as a source of information about process functioning. At the same time, some negative or ambiguous responses show that the mere conduct of audits does not yet guarantee the use of their results.

Table 6. Recurrence of the same nonconformities after audits according to respondents (n = 40)

Frequency of recurrence of the same nonconformities	Number of indications	Share of respondents
Very rarely	1	2.5%
Rarely	14	35.0%
Moderately	14	35.0%
Often	11	27.5%
Very often	0	0.0%

Source: own elaboration

This assessment was complemented by an analysis of nonconformity recurrence (Table 6 above). Respondents’ answers indicate that the same problems may recur with different frequency. In some organisations, this phenomenon occurs rarely, but a noticeable group of respondents indicated moderate or frequent recurrence of nonconformities. This result suggests that audit effectiveness should be assessed not only by the number of detected problems, but also by the organisation’s ability to limit their recurrence after corrective actions are completed.

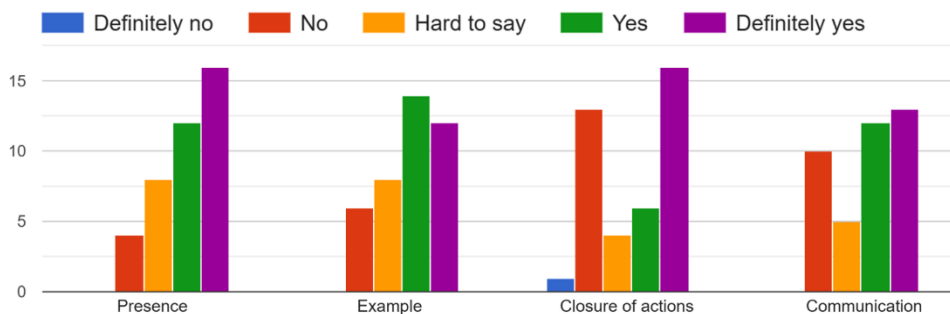


Figure 5. The role of leaders in audits and post-audit actions according to respondents (n = 40)

Source: own elaboration

The last analysed area concerned the role of leaders in the audit process (Table 5 above). The results indicate that the presence of leaders in audits is noticed by a significant proportion of respondents, but their role in closing post-audit actions was assessed as lower. This means that the mere participation of management staff in audits is insufficient to fully realise their improvement potential. Appropriate communication of results, assignment of responsibility, monitoring of corrective actions, and enforcement of lasting improvements are key.

5. Discussion

The inclusion of the survey enabled triangulation of the results obtained from the case studies. Analysis of internal documentation made it possible to assess formal assumptions and procedures; direct observations captured the actual course of audit activities. Combining these sources with the results of a survey of people with experience in audit practice made it possible to examine more broadly the role of audits in manufacturing enterprises.

The obtained results indicate that quality audits perform a function broader than formal conformity control. Both the case studies and the survey demonstrate their importance for work standardisation, nonconformity prevention, improving safety and ergonomics, and generating information for process improvement. This approach is consistent with PN-EN ISO 19011:2018-08, according to which an audit should be conducted in an orderly manner, based on evidence, and oriented also toward providing information useful for the improvement of management systems and processes. Similarly, the literature emphasises that the value of audits becomes visible when they support quality management processes rather than merely confirm formal conformity (Helmold & Terry, 2021; Lenning & Gremyr, 2022).

These findings align with the literature on quality management, in which the effectiveness of quality practices is associated with their actual embedding in organisational processes, rather than merely with the formal implementation of a system (Oakland, 2014; Gremyr et al., 2021). Therefore, the difference between an audit treated as a system obligation and an audit used developmentally becomes particularly important. The value of an audit is revealed primarily when its results lead to cause analysis, assignment of responsibility, implementation of corrective actions, and verification of their effectiveness.

The analysed audit practices differed in their scope and place in the production process, but their common feature was the generation of information that could be used to improve processes. Audits supported the maintenance of work standards, the identification of sources of nonconformities, the planning of corrective actions, and the assessment of their effectiveness. A similar picture emerges from the survey, in which respondents indicated that the value of audits depends on the quality of information, the speed of response, and consistency in closing post-audit actions. In this sense, the research results align with the assumptions of TQM, as they present the audit as a mechanism linking data, responsibility, the process approach, and quality improvement activities (Kaynak, 2003; Oakland, 2014; Lenning & Gremyr, 2022; Gremyr et al., 2021; Xu et al. 2026).

At the same time, the study's interpretative limitations should be noted. The case studies covered three purposively selected enterprises, while the survey was diagnostic and included 40 respondents. This means that the results should not be statistically generalised to the entire population of manufacturing enterprises. Their significance lies primarily in the in-depth demonstration of the mechanisms by which audits function and in comparing these findings with a broader assessment by practitioners, which is consistent with the logic of complementary mixed-methods research (Creswell & Poth, 2018).

Consequently, the value of quality audits in manufacturing enterprises should be considered not only through the prism of their control function but, above all, through the use of their results. Their managerial significance becomes particularly evident when they lead to the identification of problem causes, the improvement of work standards, the strengthening of responsibility, and lasting process improvement.

6. Conclusions

The aim of the article was to identify and assess the role of quality audits in selected manufacturing enterprises. The study, based on case studies of three anonymised organisations and supplemented by a survey of 40 respondents, enabled the determination of how audits support process stabilisation, the identification of nonconformities, the initiation of corrective actions, and the development of practices consistent with the assumptions of Total Quality Management.

The obtained results indicate that the value of audits becomes evident primarily when their results are used as a source of managerial information. Audits retain their classical verification function, but their significance does not end with confirming conformity. In the analysed enterprises, audit findings provided a basis for identifying the causes of problems, assigning responsibility, initiating corrective actions, and assessing the effectiveness of the implemented solutions.

The survey data strengthen this interpretation: 65.0% of respondents indicated that an audit generates data for improvement, and the same proportion assessed their impact as strong or very strong in the early detection of problems, the reduction of nonconformities, and the support of continuous improvement.

An important finding is the diversity of audit functions depending on their position within the production process. The 6S audit supported the organisation of the work environment, operational discipline, and the maintenance of workplace standards. The final audit performed a safeguarding and selective function by reducing the risk of transferring a nonconforming product to subsequent stages or to the customer.

The product audit had the most developed process-diagnostic character, as it combined product conformity assessment with process analysis, responses to deviations, and the evaluation of corrective action effectiveness. These findings indicate that audits should be treated as complementary rather than uniform quality management tools.

The novelty of the study lies primarily in the comparative identification of these different audit functions within one analytical framework. Other research has frequently considered audits at the general level of internal auditing, conformity assessment, or quality management system maintenance, with particular attention paid to the role of audits in ISO 9001 systems, compliance verification, and the improvement potential of quality management systems (Gremyr et al., 2021; Lenning & Gremyr, 2022; Camango & Cândido, 2023).

Against this background, the present study provides an empirically grounded interpretation of how audit practices located at different points in the production process may perform distinct but mutually reinforcing roles. Based on the analysis of the three case studies, three audit functions were distinguished in this article: the workplace-organisational function represented by the 6S audit, the safeguarding function represented by the final audit, and the process-diagnostic function represented by the product audit.

These functions should be understood as an analytical interpretation derived from the empirical material, rather than as a universal classification of all quality audits. This distinction does not constitute a universal classification of all quality audits; however, it provides a useful analytical framework for explaining how the location and subject of an audit influence the type of value it generates in a manufacturing enterprise.

It should therefore be treated as the author's analytical proposal, derived from the empirical material and intended to support the interpretation of audit roles in the examined manufacturing settings (see Figure 6 below).

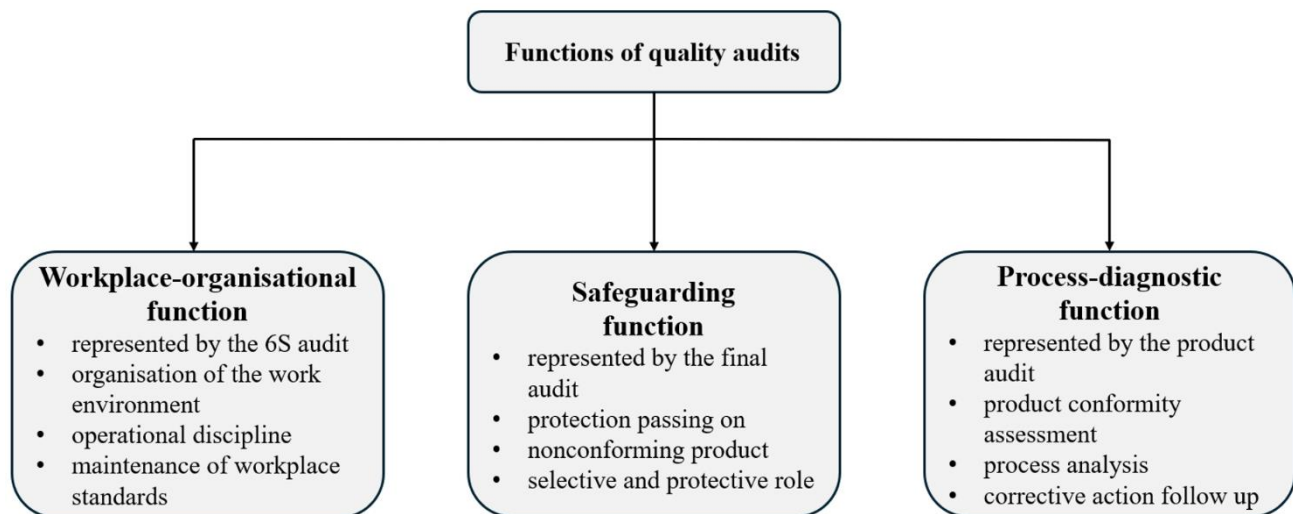


Figure 6. Proposed functional distinction of quality audits in the analysed manufacturing enterprises

Source: own elaboration.

A further contribution of the study is the identification of the mechanism through which audits may support improvement. The findings indicate that an audit does not produce organisational improvement automatically. Its potential value is achieved through a sequence of activities comprising the detection and documentation of a deviation, the communication of findings, the analysis of causes, the assignment of responsibility, the implementation of corrective actions, and the subsequent assessment of their effectiveness. This result is consistent with the literature emphasising that the value of audits and quality management systems depends on their use for management and improvement rather than solely for documentation and compliance (Gremyr et al., 2021; Lenning & Gremyr, 2022).

The study also contributes by combining evidence from organisational case studies with diagnostic survey results. The case studies provided insight into the actual functioning of three audit practices, whereas the survey made it possible to assess whether the functions identified at the organisational level were reflected in the broader perceptions of respondents familiar with quality management practices. The convergence of both sources of evidence strengthens the conclusion that audits are perceived not only as instruments of control but also as sources of improvement data and mechanisms supporting early problem detection.

The findings additionally show that quality audits contribute to the practical implementation of TQM assumptions. In the analysed organisations, they supported the process approach, developed responsibility for quality, organised the flow of information, and fostered continuous improvement. In some cases, the audit process involved employees representing different functions and organisational units, which supported a shared understanding of quality and strengthened cooperation. The results therefore suggest that the role of an audit in TQM is not determined solely by its formal position in the quality management system, but by its ability to connect information about nonconformities with coordinated organisational action.

From a practical perspective, the obtained results suggest that manufacturing enterprises may increase audit effectiveness by moving beyond their treatment as instruments used only to confirm conformity. Greater value can be achieved when audit findings are systematically connected with root-cause analysis, corrective actions, process-owner responsibility, implementation deadlines, and the assessment of action effectiveness. The results also indicate the importance of organisational barriers, including insufficient time and resources, employee resistance, poor data quality, manual data entry, and fragmented IT systems. These barriers may interrupt the transition from identifying a nonconformity to implementing and verifying an effective organisational response.

The study has several limitations. These concern the qualitative nature of the case studies, purposive case selection, the limited number of organisations, and the diagnostic rather than representative character of the survey. Consequently, the results should not be statistically generalised to the entire population of manufacturing enterprises. The proposed distinction between workplace-organisational, safeguarding, and process-diagnostic audit functions should also be treated as an empirically derived interpretation requiring verification in other organisational and industrial contexts. The value of the study lies in its in-depth presentation of the mechanisms through which different quality audits function under real organisational conditions and in the comparison of these mechanisms across several manufacturing settings.

Further research could extend the analysis to a larger number of enterprises, verify the proposed functional distinction across different industries, and examine whether similar audit configurations occur in organisations with different levels of quality management maturity. It would also be useful to combine qualitative analysis with quantitative measures such as nonconformity recurrence, response time, corrective action effectiveness, process capability, customer complaints, and selected cost-of-quality indicators. A further relevant direction concerns the relationship between audit digitalisation, data quality, the integration of audit records with enterprise information systems, and the speed and effectiveness of organisational responses.

In summary, quality audits can constitute an important element of production process improvement and the practical implementation of the TQM philosophy. The principal contribution of the study is the demonstration that different audit practices create different but complementary forms of value and that this value emerges through the conversion of audit findings into managerial information, corrective action, and verified process improvement. Their significance therefore does not result solely from their formal presence in the quality management system, but from whether the organisation is capable of transforming audit evidence into decisions, responsibility, organisational learning, and lasting improvement.

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