

ISO 9001:2015 Implementation Strategy in Small And Medium Metal Industries

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Abstract. The metal industry in Tegal has played a central role in the city's economy and the quality of life of its people for decades. However, they still rely on third parties in the product sales process, which has the potential to reduce profit margins. This dependence occurs because Metal SMEs in Tegal do not have ISO 9001:2015 certification. Metal SMEs in Tegal face obstacles in meeting the ISO 9001:2015 certification requirements from B2B buyers, especially in preparing documents that comply with the standard. This study aims to formulate an effective strategy for Metal SMEs in Tegal to prepare the documents needed to obtain ISO 9001:2015 certification. This study used a qualitative descriptive approach, which collected data through observation, interviews, and documentation studies. The results of this study provide several important strategies, such as top management participation, ISO team formation, workforce training, and preparation of procedure manuals. By implementing this strategy, it is expected to reduce dependence on third parties and expand access to international markets to encourage sustainable business growth.

Keywords: *ISO 9001:2015, Implementation Strategy, Quality Management, Metal SMEs*

1. Introduction

Quality management is an integral component of a company's competitive advantage in the era of globalization. Companies use quality as a primary competitive approach to improve organizational performance on a global scale. (Albulescu et al., 2016). ISO 9001 is a set of standards developed and published by the International Organization for Standardization (ISO), which defines, establishes and maintains an effective quality assurance system for manufacturing and service industries. Although ISO 9001 certification is voluntary, it is interesting to note that many organizations seek certification despite the significant level of commitment involved. When the organization's size is considered, ISO 9001 implementation becomes more complex (Alshahrani & Husain, 2024).

Small and Medium Industries play a vital role in countries' economies worldwide. Nevertheless, many companies regardless of their size—small, medium, or large—feel unprepared to implement ISO 9001:2015. Applying ISO 9001:2015 in Small and medium-sized enterprises (SMEs) brings specific challenges. SMEs often encounter constraints regarding knowledge, human resources, and infrastructure, which can impede the certification process and the establishment of a Quality Management System (QMS). While much of the existing research has concentrated on implementing ISO 9001 in large manufacturing companies and other major firms worldwide, evidence is scarce regarding the effectiveness of ISO 9001 in SMEs

The research conducted by Kakouris & Sfakianaki (2018) discovered that SMEs in Greece encounter obstacles such as bureaucracy, insufficient management guidance, limited time and resources, and employee resistance. These challenges differ from company to company and are experienced with varying degrees of intensity. The application of ISO 9001 QMS in large enterprises contrasts with its implementation in SMEs. Unlike larger organizations, SMEs often lack the resources needed for certification, lagging in adopting recommended quality improvement practices (Alshahrani & Husain, 2024). According to Zimon et al. (2022), smaller organizations encounter substantial challenges in the initial certification process and the ongoing maintenance and enhancement of the ISO 9001 quality management system when compared to larger organizations.

This research focuses on metal SMEs in Tegal, which have been instrumental in shaping the city's economy and enhancing the quality of life for its residents over recent decades. The adoption of ISO 9001:2015 is crucial for

addressing the challenges related to Tegal's metal SMEs dependence on third parties in the product sales process, as this reliance can potentially reduce profit margins. Furthermore, these SMEs encounter difficulties in fulfilling the certification requirements of ISO 9001:2015 as specified by B2B buyers, particularly regarding preparation documentation that meets the standard's criteria.

The current condition of metal SMEs in Tegal is as follows: The metal melting processes illustrated in Fig. 1 utilize a gas-powered furnace and take place in challenging work environments marked by exposure to heat, waste issues, and inefficient spatial organization. Moreover, the suboptimal arrangement of materials and workflow, as shown in Fig. 2, may adversely impact the final products' efficiency and quality. Those imply the urgency to improve the conditions by implementing ISO 9001:2015.



Fig. 1. The Metal Melting Process with a Gas-fired Furnace



Fig. 2. Operational Activities in the Workspace

ISO 9001 was introduced by the International Organization for Standardization (ISO) in 1987 and has since been adopted by organizations seeking to achieve organizational goals and customer satisfaction. The ISO 9001 standard was revised in 1994, 2000 and 2015 to include process approaches, risk management and other improvements (Alshahrani & Husain, 2024).

The changes to ISO 9001 are based on understanding a company's critical processes, focusing on product/service quality, and managing processes and systems through a “plan-do-check-act” approach. One of the key characteristics of ISO 9001:2015 is its focus on meeting customer needs and improving customer satisfaction through continuous process improvement. The standard is applied to many different types of organizations, both large and small, public or private, and in both the service and manufacturing sectors. ISO 9001 has become globally popular as

the basis for corporate confidence in understanding consumers and meeting regulatory needs (Alshahrani & Husain, 2024). ISO 9001 currently consists of standards for quality management systems (QMS) developed according to quality management principles such as customer focus, leadership, people involvement, continuous improvement, and relationship management (Sedevich-Fons, 2020). The ISO 9001 Quality Management System aims to satisfy customers and stakeholders by identifying opportunities, developing new products, coordinating resources, improving processes, and achieving results (Cândido, 2024). The ISO 9001 Quality Management System is organized around six essential elements: senior management, customer focus, process management, worker involvement in decision making and quality teams, employee training in problem solving, and cooperation with stakeholders. Therefore, the goal is to improve the company's performance based on continuous and systematic efforts by all its members (Barbosa et al., 2022).

Implementing ISO 9001:2015 in small and medium industries cannot be separated from various challenges. The main obstacles that often arise are limited resources and resistance to change. Metal SMEs are generally managed by business owners who also function as superiors, so the managerial burden is often too heavy to focus attention on implementing quality standards. In addition, many SME employees are accustomed to old ways of working, so implementing new procedures governed by ISO 9001:2015 is often met with skepticism. Another obstacle is resistance to change. SMEs generally have a more straightforward organizational structure, i.e., the company owner often also acts as the person in charge of operations. This causes a heavy burden in terms of management, so ISO 9001:2015 adoption is often hampered by a lack of time and capacity to focus on quality improvement. owner often also acts as the person in charge of operations. This causes a heavy burden in terms of management so that ISO 9001:2015 adoption is often hampered by lack of time and capacity to focus on quality improvement. Research by Siougale et al. (2019) highlights that top management involvement is critical in ensuring a smooth implementation process, but this is often a challenge in SMEs due to the limited understanding of the complexity of the ISO 9001:2015 standard. Another study by Esgarrancho & Cândido (2020) highlighted that another challenge in implementing ISO 9001:2015 managing risks and opportunities. ISO 9001:2015 introduces this concept as a key element in a quality management system, yet many metal SMEs do not have a formal mechanism to identify and manage risks systematically. As a result, risks associated with the production process are often poorly documented, which in turn can negatively impact product quality.

Despite the challenges, many studies have shown that the implementation of ISO 9001:2015 brings significantly benefits small and medium industries, especially regarding improved product quality and operational efficiency. One of the key benefits of implementing ISO 9001:2015 is increased consistency in the production process, which reduces product defects. In addition, with clearly documented procedures in place, metal SMEs can more easily identify areas that require improvement and take corrective action more quickly. ISO 9001:2015 standard ensures a clean and organized workplace, which can lower the risk of accidents and boost operational efficiency through improved material handling. Companies can enhance customer satisfaction by minimizing waste and maintaining product consistency. In addition, ISO 9001:2015 encourages ongoing improvement, assisting organizations in staying competitive and aligning with market requirements. This study aims to formulate an effective strategy for Metal SMEs in Tegal to prepare the necessary documents to obtain ISO 9001:2015 certification. A practical implementation strategy can help companies overcome these obstacles and gain strategic benefits from implementing the standard, such as increasing customer trust and satisfaction through organized and systematic quality assurance, a well-documented and neat system, improving the quality of employee performance, and creating a positive work culture (Bakhtiar et al., 2023). Although the benefits of ISO 9001:2015 have been proven, metal SMEs often face a number of challenges in its implementation. The main challenge is limited resources, whether financial, technical, or human resources. In addition, Cândido (2024) found that many SMEs have a limited understanding of the long-term benefits of a quality management system such as ISO 9001:2015, so it is often considered an additional cost rather than an investment.

2. Methodology

This study uses a qualitative approach to examine the implementation strategy of ISO 9001:2015 in small and medium industries (SMIs) in the metal sector in Tegal. The qualitative approach was chosen because it allows researchers to dig deeper into the experiences, perceptions and dynamics that occur during the ISO standard implementation process. This method also provides flexibility to understand the social and organizational context, which often influences the success or failure of quality management system adoption in SMEs.

This research uses a case study design to focus on several SMEs in the metal sector that have implemented or are implementing ISO 9001:2015. Case studies were chosen because this method effectively explores complex issues, especially those related to implementing quality management standards that involve many variables and interrelated processes.

The population in this study are SMEs in the metal sector that have implemented or are in the process of implementing ISO 9001: 2015. The purposive sampling technique was used to select relevant samples, namely companies with a total number of employees below 100 people and have operational activities in metal manufacturing.

The data in this study was collected through three main methods: in-depth interviews, participatory observation, and document analysis. In-depth interviews were conducted with managers, quality department heads, and employees directly involved in implementing ISO 9001:2015. These interviews were semi-structured, where the researcher used interview guidelines but provided flexibility for respondents to explore related topics that were considered important. Participatory observation was conducted at the IKM site to observe how the ISO 9001:2015 implementation process works. This technique helps understand the interaction between employees, production processes, and quality management systems in a real context. Observations were conducted over several days at each SME to ensure that researchers could observe the various stages of implementation and the impact of implementing the standard. In addition to interviews and observations, internal documents related to ISO implementation, such as quality manuals, work procedures, and audit reports, were analyzed. Analysis of these documents helped the researcher understand how ISO 9001:2015 was formally implemented and how the standard was integrated into the company's daily work processes. The documentation also provided tangible evidence of the steps taken by the company to achieve certification and the challenges faced in the process.

3. Result and Discussion

Based on the data obtained from in-depth interviews, observations, and document analysis at the five metal SMEs that were the subject of the study, there are several key findings related to the implementation of ISO 9001:2015. The implementation process in these SMEs presents significant challenges, but also provides some important strategic advantages.

3.1 Result

Management's Commitment

The interview results show that management commitment is critical in successfully implementing ISO 9001:2015. In SMEs with a strong commitment from management, the implementation process runs more smoothly. For example, SMEs whose management is actively involved in quality standard-related decision-making, such as resource allocation for employee training and development, can complete certification faster. In contrast, SMEs with less committed management faced obstacles in integrating ISO standards into their daily operations, leading to delays and additional costs in implementation.

Employee Training and Development

Employees in all the SMEs studied reported that training was an important part of the implementation process. Employees who have received ISO 9001:2015 training show a better understanding of how standard operating procedures (SOPs) and quality policies should be applied in their daily work. In one SME, practical training successfully improved the efficiency of the production process, with a 15% reduction in production cycle time after implementing new ISO-customized SOPs. However, SMEs that need more adequate training face challenges in achieving the desired quality standards. Many employees reported needing clarification about implementing ISO requirements into their operational context. This suggests that employee training is not just a formal requirement but is vital to building the awareness and skills necessary to implement ISO standards.

3.2 Discussion

The study's results suggest that implementing ISO 9001:2015 has a positive impact on SMEs in the metal sector in terms of operational efficiency, customer satisfaction, and company reputation. However, successful implementation depends on several key factors, including management commitment, employee training, and resource availability.

The Role of Management Commitment in Successful Implementation

Management's commitment is a crucial factor in successfully implementing ISO 9001:2015. Small and medium-sized enterprises (SMEs) that show strong support from their management are generally more successful in achieving certification and improving their production processes. Leadership from top management is essential for any effort to change how an organization operates, as it helps to overcome employees' resistance to change. Top management is responsible for creating reward systems to boost employee morale and motivation and guiding their efforts. They also need to support ISO 9001 and establish clear communication so everyone understands the certification-related terms similarly

Employee Training and Process Adaptation Challenges

A significant challenge small and medium enterprises (SMEs) encounter is the need for adequate employee training and development. Many SMEs have yet to embrace training to support the full implementation of ISO standards. This shortfall in training hampers effective implementation, especially in production areas where a thorough understanding of operational standards is essential. To implement ISO 9001 successfully, companies should establish training programs to improve employee skills in quality standards while clarifying the strategic direction and business goals. Training focused on quality programs and information is provided to ensure a proper learning process is in place, which is essential for successful implementation

4 Conclusion

This study reveals that implementing ISO 9001:2015 within the small and medium-sized metal industries positively impacts product quality, operational efficiency, and customer satisfaction. The standard provides a practical risk management approach, which assists companies in handling the uncertainties frequently faced in the industry. Additionally, ISO 9001:2015 encourages continuous enhancements in production processes, enabling SMEs to adapt and enhance product quality in line with dynamic market requirements.

Although implementing it can be challenging, such as limited resources and resistance to change, management's strong commitment and proper employee training can address these issues. The long-term benefits of getting this certification include building customer trust, creating growth opportunities, and improving the company's competitive position. Thus, ISO 9001:2015 is not just a quality standard; it's also a smart move to support the growth and sustainability of small and medium metal businesses.

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