

Enhancing Quality Management Systems (ISO 9001) Implementation in Pakistan's Manufacturing Industry: A Case Study

Zohaib Khan^{1,2*}, Yusri Bin Yusof¹, Anika Zafiah Mohd Rus¹, Yazid Saif¹

¹ *Advanced Manufacturing and Materials Center (AMMC), Faculty of Mechanical and Manufacturing Engineering Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor, MALAYSIA*

² *Mechanical Engineering Department, Quaid e Awam University of Engineering, Science & Technology Larkana Campus, 77150, Sindh, PAKISTAN*

*Corresponding Author: aghazohaib03@gmail.com

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Abstract

The ISO 9001 certification has become popular with its effectiveness in enhancing the organization's commitment to satisfying customer's needs hence guaranteeing consistency in quality of products. ISO 9000 is one of the most successful spin-offs of the drive for quality, which came into prominence during the 1980s. The quality standards set forth by ISO 9001 that are world famous even if students are studying within the context of Pakistan in 2015. Manufacturing industries are a significant contributor to the expansion of GDP in Pakistan, and hence are very vital for the country. Despite their increasing competitiveness and complexity, the implementation of ISO 9001, To identify it 2015 within the manufacturing sector of Pakistan is still quite challenging. The purpose of this research is to establish the causative factors that have mitigated the probability of achieving ISO 9001 in the manufacturing industries of Pakistan and the development of proper solutions to these problems. Both quantitative and qualitative techniques were used as a basis for data collection in the study. The analysis revealed 11 significant barriers to ISO 9001:2015 implementation, with the most critical factor found to be leadership commitment from top management, perceived unrealistic ISO requirements, and insufficient employee training, all with mean scores over 4.5 on the Likert scale. The study has brought out the need to address gaps and come up with specific strategies that would enhance the chance of achieving ISO 9001 in the sector. These insights could lead to offering precious information to improve the conformance of the manufacturing industry in Pakistan to ISO 9001 standards, and thus boost economic development.

1. Introduction

There is also the fact that the companies which passed the procedure of receiving the ISO 9001 title, will be focused on satisfying the clients' needs, and the clients will be able to receive high-quality goods and services [1]. It is one of the series of standards in Quality Management System (QMS) which assists organizations to continuously enhance their operations. Being audited every five years, ISO 9001 helps organizations remain relevant in a constantly changing world [2]. Globalization in organizations has ensured that several standardized techniques

are used in an organization to produce quality goods and services; TQM principles, formulation of quality policies and formation of international accreditation and certification bodies [3].

During the 1950s wholesalers and retailers in manufacturing companies could sell almost any product they produced and the problem of inconsistency in product and services became apparent as the market competition increased [4]. Management realized that quality was an important variable because it determined trade by the number of industries, price level and customers [1]. In the case of quality processes of a company or an organization ISO 9001 acts as the standard within the QMS [5]. Delivering 1.1 million certifications in 188 countries, it is the most applied technical specification across the globe. More than 5,000 companies certified to ISO 9001 in Sweden practice these today as previously stated by Fonseca and Domingues [6]. ISO 9001 reflects different aspects of quality assurance since it outlines numerous procedures and tools for a firm or organization to implement to achieve the required product quality that meets the customer requirement.

The core purpose of this study is to comprehend the most important characteristics, features, issues, and problems of the subject. This research highlights the problems and issues associated with the functioning and implementation of ISO 9001:2015 [6,7]. Furthermore, this section presents the information regarding ISO 9001:2015 global registrations besides the outline of the theoretical framework that leads and guides its operation and implementation [8]. The purpose of this section is to present an inclusive, comprehensive, and significant review of the literature related to the implementation of ISO 9001 [9]. Moreover, it focuses to take account of sine qua non and appropriate variables in the review of the literature besides the subject matter which is previously marginalized by the other associates and researchers [10]. Apart from that, the manufacturing organization and companies can utilize this role and information to progress and advance their functions besides operations [11].

The QMS is the name for numerous businesses and economical processes that emphasis on augmenting the satisfaction of clients and meeting customer necessities [12]. The seven criteria for quality administration form the foundation of ISO 9001. These fundamental beliefs, imperatives, conventions, and values that serve as a foundation for the firm, company, and organizations' ultimate performance development are these standards and codes [13]. Table 1 shows the seven standards, principles, and codes [14], such as customer focus, leadership, engagement of people, improvement, Evidence-based decision making, Relationship management.

Table 1 *Identified key finding in this study*

Author(s)	Study Focus	Key Findings	Implications for Current Research
Fonseca et al. (2023) [6]	ISO 9001:2015 implementation in various industries	Identified significant factors hindering ISO 9001 implementation, such as leadership and unrealistic standards	Highlights barriers in ISO 9001 implementation, forming the basis for the current study
Andres-Jimenez et al. (2020) [8]	ISO 9001 global registrations and theoretical framework	Explored the global adoption of ISO 9001 and its theoretical underpinnings	Provides a framework to analyze the theoretical aspects of QMS in this study
Astrini (2021) [9]	Review of ISO 9001 performance metrics	Examined the role of ISO 9001 in improving performance in the manufacturing sector	Supports the focus on the manufacturing sector in this study
Owusu-Kyei et al. (2023) [12]	QMS and customer satisfaction in telecom industries	Found that QMS principles directly influence customer satisfaction	Reinforces the importance of QMS in customer satisfaction and service quality
Sarmiento (2023) [15]	Economic impact of ISO 9001 implementation	Demonstrated economic benefits of QMS adherence in organizations	Provides evidence of economic advantages, supporting the rationale for QMS adoption
Chukwu et al. (2023) [13]	Seven principles of ISO 9001 and their impact on organizational development	Emphasized leadership and evidence-based decision-making as key success factors	Aligns with the study's focus on leadership and organizational barriers

Practicing a quality management system in a planned resolution enhances business performance and quality. Earnings and economic advantages of implementing excellent administration scheme by following the international codes and principles [15,16]. Retain a constant surge of goods and/or services that administer to fulfil the customers' requirements besides conforming to the legal and regulatory legislation [17]. i) To enhance consumer contentment by facilitating chances and opportunities. ii) The Quality administration scheme prerequisites mentioned in the ISO 9001:2015 codes and the standards are considered to correspond to requirements necessary for the products and the services [18]. The international codes and standards are taking on a progressive approach that also integrates the PDCA-cycle (Plan-Do-Check-Act), besides the risk-based thinking.

The fundamental model could be interpreted: an organization and a company do incorporate new processes or implement new ISO code or standard. The PDCA cycle proposes a test preparation for instance a process that guides companies or organizations at the time of proceeding with the changes or solving the problems as shown in Fig. 1. The PDCA-cycle is applied as a procedure that also encompasses the test data and feedback. To better understand the relevant research, the following table summarizes key previous studies related to ISO 9001:2015 implementation.

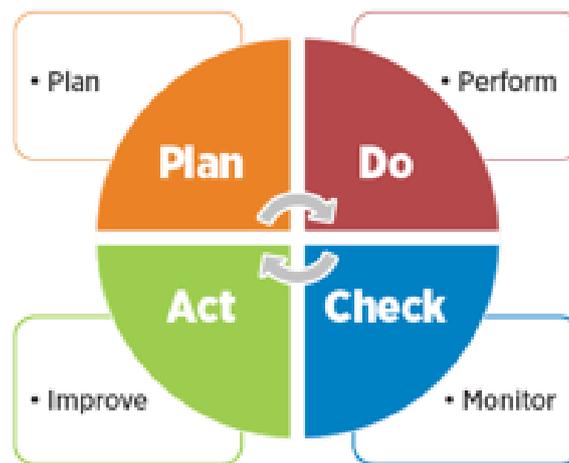


Fig. 1 PDCA-cycle

2. Research Methodology

The primary purpose of this research is to explain the research methods and tools. It begins with the plan of the methodology along with a summary of the research design. The methodology of research along with data collection techniques which are quantitative approach and qualitative approach will be presented to perform analysis using SPSS. In the end, a befitting approach in pursuit of achieving the objectives will be elaborated. Fig. 2 and Table 2 show the process of ISO 9001 based on textile manufacturing industry of Pakistan.

The questionnaire identified common factors which hinder the implementation of ISO 9001:2015 in all countries of the world but only some of the factors that only applied to the Pakistan environment were highlighted. In this research, there were two stages of the survey to identify potential factors which affect the ISO 9001 implementation in the Pakistan manufacturing industry. The first stage is to distribute the designed questionnaire in person for covering most of the manufacturing organizations in Pakistan. After gathering the data from the questionnaire, the data was analyzed. While, the second stage was a semi-structured questionnaire, which is a qualitative approach.

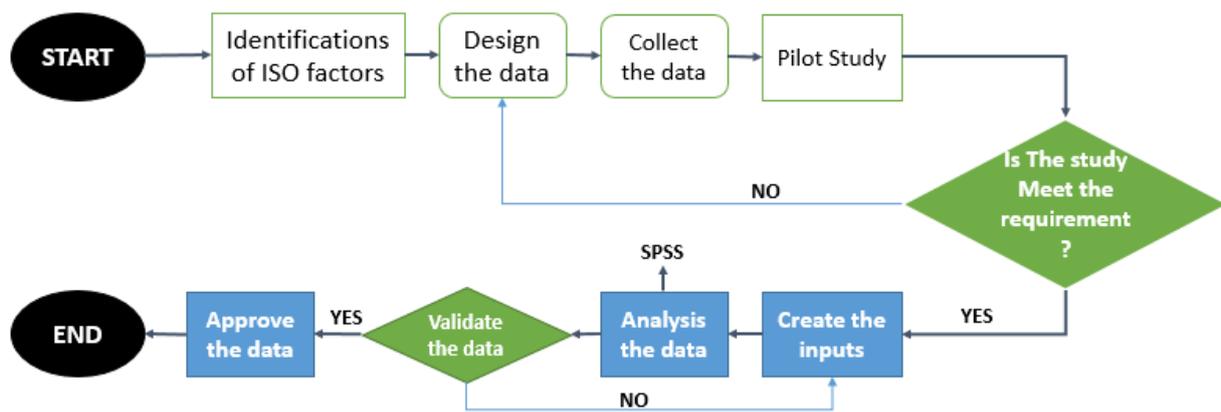


Fig. 2 Flow chart of ISO 9001 process

Table 2 Summary of research objective and methodology

Objective	Method	Analysis	Factors
Improve the textile manufacturing industry in Pakistan	Quantitative Questionnaire survey	SPSS (Significant test)	11

Data collection is a method of collecting data from different sources [19, 20]. Data for this research was obtained by using a “mixed method” which consists of both quantitative and qualitative approaches. The quantitative approach is used by employing the questionnaire as an instrument of data collection [21]. While in the qualitative method, the data is collected through the semi-structured questionnaire that was carried out for recommendations of implementation of ISO 9001:2015 in Pakistan manufacturing industry. In this research, the processing of collected data was done according to the following sequence described in detail in the subsequent sections. identification of the factors which hindrance the implementation of ISO 9001:2015 in the manufacturing industry of Pakistan through literature review. identification of significant factors which hindrance’s the implementation of ISO 9001:2015 in the manufacturing industry of Pakistan. the identification of significant factors which hinder the implementation of ISO 9001:2015 in the manufacturing industry of Pakistan. Respondents of the survey were from managerial positions in the manufacturing industries in Pakistan. Respondents were requested to share their knowledge and experience about the barriers in the implementation of ISO 9001:2015 in the manufacturing industry of Pakistan [22].

In this study, a closed-ended questionnaire was designed to collect quantitative data on the factors affecting ISO 9001:2015 implementation. The questionnaire was carefully developed to ensure clarity and relevance, adhering to the following stages of survey design:

1. **Defining Research Objectives:**

The first step involved clearly defining the research objectives, specifically to identify significant barriers to the implementation of ISO 9001:2015 in Pakistan's manufacturing industry.

2. **Literature Review:**

A comprehensive literature review was conducted to identify common factors influencing ISO 9001 implementation across different contexts. This informed the selection of relevant variables for inclusion in the questionnaire.

3. **Questionnaire Development:**

The questionnaire consists of two main parts:

- **Part One: Demographic and Organizational Information:** Gathered data such as organization name, type, respondent’s position, work experience, gender, and educational qualifications.
- **Part Two: Identification of Significant Factors:** Included **Likert scale questions** such as: "The lack of commitment from top management is a significant barrier to ISO 9001 adoption," rated from 1 (Strongly Disagree) to 5 (Strongly Agree).

4. Pilot Testing:

A pilot test was conducted with 15 participants from the manufacturing sector, whose feedback was instrumental in refining the questionnaire for clarity and relevance.

5. Data Collection:

The final questionnaire was distributed to stakeholders in the manufacturing industry throughout Karachi, focusing on managerial staff. Informed consent was obtained from all participants, ensuring confidentiality and ethical compliance throughout the research process.

6. Data Analysis:

After data collection, responses were analyzed using the **SPSS** platform. Descriptive statistics, including mean scores and standard deviations, were calculated to identify the most significant barriers to ISO 9001 implementation. The analysis also included correlation analysis to explore relationships between identified factors.

3. Results and Discussion

For further analyzed to determine the maximum, minimum and mean values of average index score (AI) and standard deviation (SD) for each factor, as given in Table 3.

Table 3 Criteria for analyzing the level of significance

Items	Average Index	Standard Deviation (S.D)
Maximum	3.95	1.223
Minimum	2.93	0.997
Mean	3.04	0.9405

Table 4 shows the value of maximum and minimum mean value of 4.792 and 3.095 respectively. Factors having a mean value above than 3.6 are considered as significant from Table 2, 11 factors are acceptable and considered most significant.

Table 4 Analysis of significant factors

Identifying the Significant Factors Influencing ISO	Mean Value	Ranking
Leadership from top management of the company	4.792	1
ISO requirements as unrealistic	4.784	2
Insufficient employee training	4.599	3
Production Training in the industry	4.463	4
Insufficient Human Resources	4.229	5
Action orientation by industry	4.207	6
Technology resources in the company	4.178	7
Training to all employees of the company	4.634	8
Employee resistance	4.019	9
Top management commitment	3.977	10
Accountability in industry	3.591	11

The measure of central tendency and dispersion provides a way to have a feel for the collected data set. Descriptive statistics such as maximum, minimum, mean, and standard deviation were obtained for internal-scale dependent variable for all eleven independent variables as shown in Table 5.

Table 5 Descriptive statistics for interval scale variables

Factor Code	Independent variables	N	Min	Max	Mean	S.D
1	Leadership from top management of company	100	01	05	3.170	.8117
2	ISO requirements as unrealistic	100	01	05	2.651	.718
3	Insufficient employee training	100	01	05	2.742	.725
4	Availability of Quality Manuals	100	01	05	2.871	.8740
5	Production Training in the industry	100	01	05	3.605	.464
6	Previous record of Quality	100	01	05	3.517	1.547
7	Insufficient Human Resources	100	01	05	3.757	.610
8	Action orientation by industry	100	01	05	2.831	.821
9	Technology resources in the company	100	01	05	2.660	.867
10	Top management commitment	100	01	05	2.732	.797
11	Accountability in industry	100	01	05	3.042	.754

Most Significant Factors which hinder the Implementation of ISO After the analysis of the collected data, this study selected 11 factors with the highest average-index score (between 3.95 to 3.58). These 11 factors are considered the most significant factors in which hinder the implementation of ISO 9001:2015 in the manufacturing industry of Pakistan, as given in Table 6 and Fig. 3.

Table 6 Descriptive statistics for interval scale variables

Factor Code	Most Significant factors hindering ISO9001:2015	AI	SD	Ranking
1	Leadership from top management of company	3.95	1.223	1
2	ISO requirements as unrealistic	3.82	1.025	2
3	Insufficient employee training	3.80	1.112	3
4	Availability of Quality Manuals	3.78	0.989	4
5	Production Training in the industry	3.75	1.216	5
6	Previous record of Quality	3.73	1.230	6
7	Insufficient Human Resources	3.71	1.145	7
8	Action orientation by industry	3.68	1.132	8
9	Technology resources in the company	3.66	1.157	9
10	Top management commitment	3.64	1.029	10
11	Accountability in industry	3.61	1.168	11

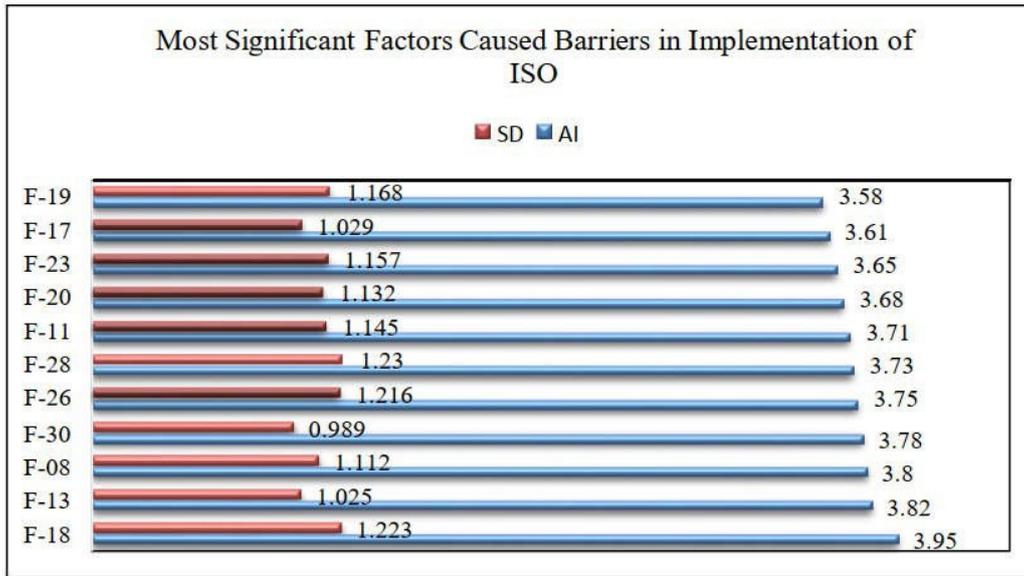


Fig. 3 Most significant factors caused barriers in the implementation of ISO

According to Pearson correlation following are the results on basis of strong relationship among factors and recommendations for implementation of ISO 9001:2015, as shown in Table 7.

Table 7 Results of pearson correlation

Factors	Recommendations	Confidence level
Leadership from Top management	Leadership from top management of manufacturing industry should be encouraged for advantages of ISO 9001:2015	.871**
ISO requirements as Unrealistic	Standards of ISO 9001:2015 should be shared among the manufacturing industry	.752**
Insufficient employees training	Sufficient training should be given among employees	.761**
Availability of quality manuals	Training should be given to staff about quality manuals	.696**
Production training in industry	Production training should be arranged in the industry	.681**
Previous record of quality	A mechanism should be developed to keep the previous record of quality	.868**
Insufficient human resource	Facilities should be given to available staff	.823**
Action orientation by the industry	Orientation actions in the industry should be made	.838**
Technology resources in the industry	New technologies should be updated in the industry	.870**
Top management commitment	Advantages of implementation ISO9001:2015 should be shared among top management	.801**
Accountability of the industry	Team of ISO 9001:2015 should adopt the process of accountability in each industry	.782**

The study identifies 11 primary factors preventing the implementation of ISO 9001:2015 in Pakistan's manufacturing industry. These include top management leadership, perceived challenges, insufficient employee

training, limited human resources, industry proactive approach, technology resources, and top management commitment. The results provide valuable insights for successful implementation.

4. Conclusion

In fact, the ISO 9001 certification is an essential factor that establishes the imprint for enhancing commitment to customer needs and consistency of their goods and services. ISO 9001: As one component of a wider Quality Management System (QMS), the system increases the effectiveness and effectiveness of an organization's activities. The integrated QMS in accordance with ISO standards significantly adds to product quality and also has numerous financial and economic advantages. This study was conducted to identify the most significant factors hindering the successful implementation of ISO 9001 in the Manufacturing Industry of Pakistan: A Analytical Review of 2015. An interview was administered among 300 respondents and a structured questionnaire was used with 239 received and used through the use of SPSS plat form. The analysis identified 11 key factors that act as barriers to ISO 9001:2015 implementation. The most significant factors, based on their mean score and ranking, include:

1. Leadership from Top Management: The means of the scores were calculated to be 3.95, out of a possible 5, except for the first, which was calculated to be 4.51 means with the lack of commitment from senior management as the highest ranked barrier, this still stress out the importance of leadership for adopting ISO 9001.
2. Perceived Unrealistic ISO Requirements: Some of the respondents believed that the set ISO 9001 standards' requirements were cumbersome and not adaptable to the manufacturing industry.
3. Insufficient Employee Training: Inadequate training proved to be another practice, which prevented employees from maintaining ISO 9001 procedure.
4. Production Training in the Industry: Another major facilitator was the lack of production training specific to the industry; therefore, pointing at the need for more specialized training.
5. Insufficient Human Resources: Lack of adequate human resources allocation and constraints in human resource management were the main causes of limited implementation.
6. Action Orientation and Technological Resources: An insight in the proactive orientation of the industry and the possibility of acquiring updated technology also contributed to success implementation of ISO.
7. These findings underscore the importance of top management commitment and adequate employee training in overcoming the challenges of ISO 9001:2015 implementation. To rectify these barriers particularly the absence of leadership and perception of achievability of set goals, the drive towards ISO 9001 success rate in Pakistan's manufacturing industry will have to be boosted.

The findings of this research can inform policymakers and organizations on how to develop viable mechanisms to address these factors with an aim of improving overall implementation process of these factors in line with international quality standards.

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Author Contribution

Zohaib Khan: Conceptualization, Methodology. Zohaib Khan: Formal analysis, Data curation, Writing – original draft, preparation, Software. Yusri Bin Yusof: Investigation, Writing – review & editing.

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