

Recommendations for the Implementation of ISO 9001:2015 in the Manufacturing Industry of Pakistan

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Abstract-ISO 9001:2015 is known as the highest quality management standard, enhancing customer and company satisfaction. While the manufacturing industry is playing a vital role in Pakistan's GDP, the implementation of ISO 9001:2015 is not widespread. This study aims to examine the factors that hinder the implementation of ISO 9001:2015 in Pakistan's manufacturing industry and recommend suggestions to overcome them. An in-depth literature review identified 32 general factors that hinder the implementation of ISO 9001:2015. A structured questionnaire was designed and distributed to 135 respondents to examine the factors hindering the implementation of ISO 9001:2015 in Pakistan's manufacturing industry. The gathered data were analyzed using the average index formula, and 8 significant factors were identified. These factors were used in the design of a semi-structured questionnaire distributed among high qualified and experienced respondents working in top managerial posts of manufacturing industries in Pakistan. The collected data were analyzed using content analysis. The findings can be helpful in the determination of recommendations regarding the implementation of ISO 9001:2015 in the manufacturing industries of Pakistan.

Keywords-recommendations; manufacturing industry; ISO 9001:2015; significant factors

I. INTRODUCTION

ISO 9001 is based on seven quality administration standards. These standards and codes are elementary convictions, imperatives, norms, and values that form a foundation that ultimately leads firms, companies, and organizations to performance enhancement. Before, on ISO 9001:2008, the principles were based on 8 quality administration standards, and later they were decreased to the seven quality executive code standards [1, 2]. The previous ISO 9001 edition referred to "products" which encompassed every kind of product, while the definition "purchasing" was altered to "control of externally provided processes, products, and services". So, the organizations that subcontract these functions

or processes can ensure that their external suppliers comply with the definitions of the administration system [3]. The fundamental model could be interpreted as an organization or a company incorporating the new processes or implementing the new ISO standard. The PDCA cycle proposes a test preparation process that guides companies or organizations during changes or problem-solving procedures. The PDCA cycle includes test data and feedback [4]. The major parts of this sequence involve numerical procedure control strategies in the production process, simplifying quality enhancement. The PDCA cycle was applied by Japanese industrial engineers with enormous success. For instance, the Toyota Production System (TPS) is partially associated with PDCA scientific schemes and quality control [5]. In underdeveloped countries, fewer organizations are certified by ISO 9001 in comparison to the developed countries. As North American and European countries demand trustworthy infrastructure for the ISO 9001 list and registration, uncompliant organizations cannot access these markets [6]. In many countries, the production sector has an important and vibrant position [7], while unsteadiness in the production division may cause turbulence on the whole economy. Several studies investigated the business sector in numerous, developing and developed, countries. Previous studies reported that although there is significant literature on the ISO 9001, only a few publications highlighted the problems, the issues, and the challenges of the ISO 9001, especially in the developing countries [8, 9]. Besides, progress in the implementation of ISO 9001 has been noticed in Middle East countries among numerous groups of companies in the United Arab Emirates, Kuwait, Lebanon, Qatar, and Oman, while Pakistani companies are trying to incorporate the codes and the standards to obtain the official certification.

Experimental research was carried out in Egypt, by selecting a sample of industrial organizations to explore the critical aspects of the application process of ISO 9001 [10]. The study highlighted the problems arising during the application of ISO 9001 principles, the administration body's actions to apply

them successfully, and reported the necessity to alter the organizational system to conform. Hence, the employees' confrontation during the implementation of the standards was the most momentous issue faced. Furthermore, 11 probable elements that influence the application of ISO 9001 were recommended. The responders were requested to rate the intensity to which every dimension influenced them, and the scale ranged from "very helpful" to "not helpful at all". Thus, by investigating the outcomes, it was shown that the main advantageous elements in the successful application of ISO 9001:2015 were the commitment from apex supervision, the devotion of the company's in-house auditor, the well-designed system of the procedures, and the support from the mother organization or the partner.

A study conducted on ISO 9001 certified goods and manufacturing companies in Pakistan reported 8 prominent difficulties during the procedure [11]. Another study reported the following significant aspects that assist the ISO 9001 implementation in Pakistan: a well-organized process system, the commitment of higher management to the goal, and the useful views from domestic auditors [12]. Moreover, the major problems connected to the standards' application were the requirements to change the prevailing systems, the uncertainty reported by the employees concerning the alteration, and the lack of understanding and respect to the ISO principles illustrated by all departments. Furthermore, several problems and issues concerning the function of the quality structure factors in the Pakistani manufacturing field were reported, such as the inspiration for the registration, the cost of the official ISO certification and the training plans, the quality guidelines, the registration companies, the ISO advantages, and the formal auditing.

II. RESEARCH METHODOLOGY

The main objective of this study was to identify the significant factors which hinder the implementation of ISO 9001:2015 in the manufacturing industry of Pakistan and determine recommendations to overcome them. An in-depth literature review was conducted which identified 32 common factors that hinder the implementation of ISO 9001:2015 in the manufacturing industry worldwide. A structured questionnaire was designed and developed based on the identified common factors shown in Table I. The questionnaire was distributed among 130 experienced respondents who were working in the manufacturing industry of Pakistan. The respondent's experience profile is shown in Figure 1.

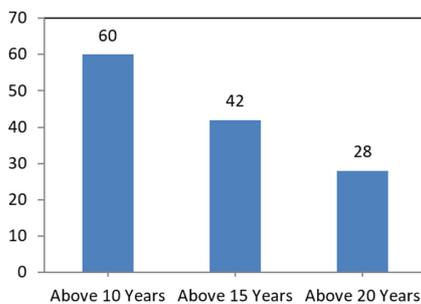


Fig. 1. Respondents' experience.

TABLE I. FACTORS HINDERING ISO 9001 IMPLEMENTATION

	Factors hindering ISO implementation	1	2	3	4	5
1	Absence of ISO 9001 certification					
2	Unwillingness to change organizational culture					
3	Inflating the size of documents					
4	Unwillingness to change work system					
5	Weak Interdepartmental relationship					
6	Management involvement					
7	Insufficient knowledge in quality					
8	Insufficient employee training					
9	Training to top management by industries					
10	Insufficient knowledge in quality					
11	Insufficient Human Resources					
12	Shortage of financial resources					
13	ISO requirements as unrealistic					
14	Absence of consulting boards					
15	Difficult to implement ISO					
16	Employee resistance					
17	Top management involvement					
18	Leadership from top management of company					
19	Accountability in industry					
20	Action orientation by industry					
21	Credibility of the industry					
22	Collaboration among Industries					
23	Technology resources in the company					
24	Big quality standards					
25	Complexity in industries					
26	Rules & Regulations					
27	Training of staff					
28	Previous record of Quality					
29	Inspection and Testing					
30	Unavailability of Quality Manuals					
31	Employees behavior					
32	Corrective and preventive action					

The gathered data were statistically analyzed using the average index formula. Factors having an average score of more than 3.6 were marked as significant factors that hinder the implementation of ISO 9001:2015 in the manufacturing industry of Pakistan [13]. These factors are shown in Table II.

TABLE II. LIST OF SIGNIFICANT FACTORS

No	Significant Factors	AI Score	Ranking
01	Absence of ISO 9001 Certification	4.874	01
02	Unavailability of Quality Manuals	4.764	02
03	Training of Staff	4.697	03
04	Top Management involvement	4.518	04
05	Employees behavior	4.473	05
06	Management involvement	4.197	06
07	Rules and Regulations	3.954	07
08	Difficult for implementation of ISO	3.879	08

After identifying the significant factors, a semi-structured questionnaire was developed and distributed to 50 top managerial respondents to investigate recommendations for each significant factor hindering the implementation of ISO

9001:2015 in Pakistan's manufacturing industry. The academic qualification of the selected respondents is shown in Figure 2. Gathered data from the semi-structured questionnaire were analyzed using content analysis. Content analysis is a research method involving a thorough inspection of human conversation and a systematic, objective, quantitative analysis of human characteristics. After revising the collected data of every aspect that may be relevant, the coding frame was developed [14].

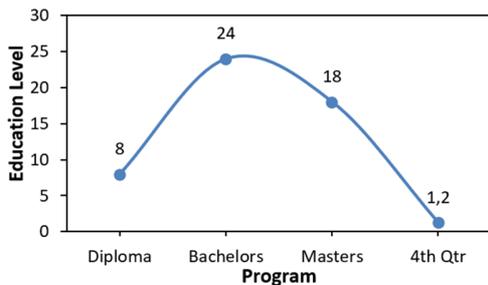


Fig. 2. Respondents' academic qualification.

III. DATA ANALYSIS AND RESULTS

Cronbach's alpha measures the internal consistency or reliability of survey data, and it was utilized to evaluate the reliability of the data set using SPSS v27. As Cronbach's alpha was measured at 0.914, it was reliable to proceed further [15]. Eight significant factors were found to hinder the implementation of ISO 9001:2015 in the manufacturing industry of Pakistan. Content analysis revealed some recommendations and suggestions to counteract those hindering factors, as shown in Table III.

TABLE III. RECOMMENDATIONS FOR SIGNIFICANT FACTORS

Factor	Recommendations	Frequency
1	1. ISO certification should be clear	47
	2. Process of ISO certification should be explained	45
	3. Owner should be informed of ISO certification	42
2	1. Quality manuals should be available easily	48
	2. Quality manuals should be explained	45
	3. Quality manuals should be revised	41
3	1. Training of staff	48
	2. Staff should be informed of ISO 9001 benefits	45
	3. Training should be done regularly	41
4	1. Top management should be involved in ISO 9001 certification	48
	2. Brief should be given for advantages of ISO 9001	46
	3. Top management should be given examples of ISO 9001 certified industries	43
5	1. Employees should be informed of ISO 9001 advantages	49
	2. Employees should follow the standards of ISO 9001	46
	3. Employees should be trained on ISO-9001	44
6	1. ISO certification training should be given to management	48
	2. Management should be informed of ISO 9001 advantages	45
	3. Quality manuals should be revised	41
7	1. Rules and regulations should be informed to all staff	48
	2. Policies of ISO 9001 should be easily understood	45
	3. Training should be done regularly	41
8	1. Clear concept of ISO 9001 should be explained	48
	2. Implementation procedure of ISO 9001 should be made easy	46
	3. Top management should be informed on the advantages of ISO-9001	43

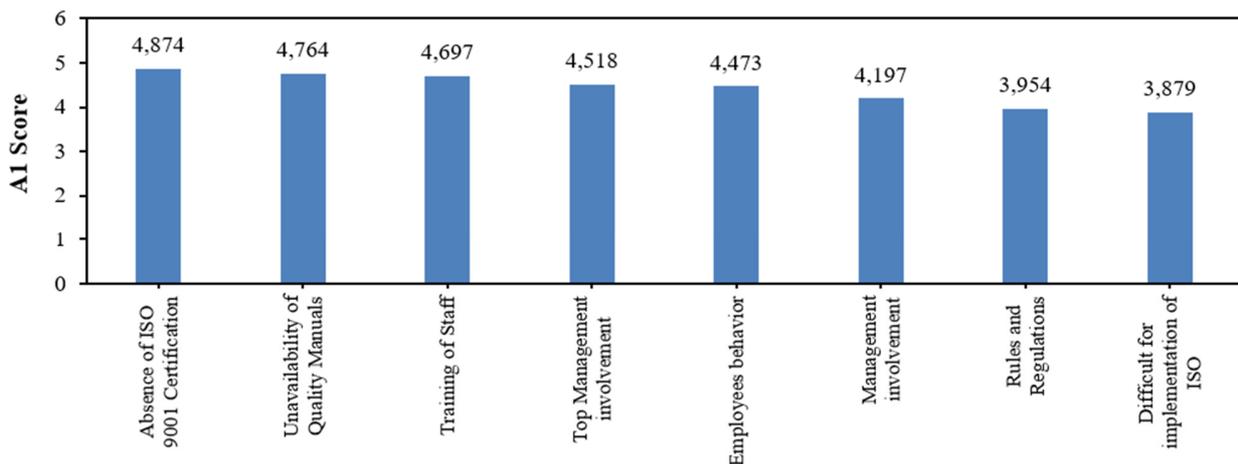


Fig. 3. Significant factors hindering the implementation of ISO (with AI score).

IV. CONCLUSION

ISO certification plays an important role in any country's GDP development. The implementation of ISO 9001:2015 in Pakistan's manufacturing industry is a serious concern. Eight

significant factors were found to hinder the implementation of ISO 9001:2015 in Pakistan's manufacturing industry. Recommendations and suggestions were pointed out by the qualified and experienced professionals of Pakistan's manufacturing industry. The proposed suggestions for the

implementation of ISO 9001-2015 include training to employees and administrative staff, and informing the top management of the advantages of ISO implementation. This study will be helpful for the implementation of ISO 9001-2015 in the manufacturing industry of Pakistan.

REFERENCES

- [1] M. M. Chhikara, D. M. S. Narwal, and M. P. Dahiya, "Implementation of Six Sigma in Indian Manufacturing Industries," *International Journal of Advance Research, Ideas and Innovations in Technology*, vol. 3, no. 1, pp. 22–30, Feb. 2017.
- [2] D. Hoyle, *ISO 9000 Quality Systems Handbook - Updated for the ISO 9001:2008 Standard*, 6th ed. New York, NY, USA: Routledge, 2009.
- [3] S. I. S. A.- Hawary and F. M. F. Aldaihani, "Customer Relationship Management and Innovation Capabilities of Kuwait Airways," *International Journal of Academic Research in Economics and Management Sciences*, vol. 5, no. 4, pp. 201–226, Dec. 2016, <https://doi.org/10.6007/IJAREMS/v5-i4/2463>.
- [4] J. R. Evans and W. M. Lindsay, *An Introduction to Six Sigma and Process Improvement*, 2nd edition. Stamford, CT, USA: Cengage Learning, 2014.
- [5] A. Jönsson and M. Berglund, "ISO 9001:2015 implementation at a manufacturing company," M.S. thesis, Halmstad University, Halmstad, Sweden, 2016.
- [6] H. Latan, C. J. Chiappetta Jabbour, A. B. Lopes de Sousa Jabbour, P. de Camargo Fiorini, and C. Foropon, "Innovative efforts of ISO 9001-certified manufacturing firms: Evidence of links between determinants of innovation, continuous innovation and firm performance," *International Journal of Production Economics*, vol. 223, May 2020, Art. no. 107526, <https://doi.org/10.1016/j.ijpe.2019.107526>.
- [7] N. S. Siddharthan and K. Narayanan, Eds., *Innovation and Global Competitiveness: Case of India's Manufacturing Sector*, 1st ed. New York, NY, USA: Routledge, 2018.
- [8] A. S. A. Al-mijrab, M. E. Elgharib, and M. A. Al-Griw, "Critical Success Factors of ISO/IEC 17025 Implementation within Arabic Countries: A Case Study of Libyan Research Centres and Laboratories (LRCL)," presented at the 23rd International Conference on ISO & TQM 23-ICIT, Zhuhai, China, May 2019.
- [9] A. Kakouris and E. Sfakianaki, "Motives for implementing ISO 9000 – does enterprise size matter?," *International Journal of Productivity and Performance Management*, vol. 68, no. 2, pp. 447–463, Jan. 2019, <https://doi.org/10.1108/IJPPM-03-2018-0096>.
- [10] H. Magd, "Quality Management Standards (QMS) Implementation in Egypt: ISO 9000 Perspectives," *Global Business and Management Research; An International Journal*, vol. 2, no. 1, pp. 57–68, 2010.
- [11] M. Shafiq, "Implementation of Quality Management Systems and Business Excellence Frameworks in Pakistani Textile Companies," *Journal of Quality and Technology Management*, vol. 8, no. 2, pp. 11–23, Dec. 2012.
- [12] W. Ahmed, "ISO 9001 Transition and its Impact on the Organizational Performance: Evidence from Service Industries of Pakistan," *International Journal of Research in Business Studies and Management*, vol. 4, no. 3, 2017, <https://doi.org/10.22259/ijrbsm.0403004>.
- [13] S. Sohu, A. H. Abdullah, S. Nagapan, T. A. Rind, and A. A. Jhatial, "Controlling Measures for Cost Overrun Causes in Highway Projects of Sindh Province," *Engineering, Technology & Applied Science Research*, vol. 9, no. 3, pp. 4276–4280, Jun. 2019, <https://doi.org/10.48084/etasr.2749>.
- [14] G. Durak *et al.*, "Content Analysis of Master Theses and Dissertations Based on Action Research," *Journal of Education and Training Studies*, vol. 4, no. 12, pp. 71–80, Nov. 2016, <https://doi.org/10.11114/jets.v4i12.1906>.
- [15] S. Sohu, A. H. Abdullah, S. Nagapan, A. A. Jhatial, K. Ullah, and I. A. Bhatti, "Significant Mitigation Measures for Critical Factors of Cost Overrun in Highway Projects of Pakistan," *Engineering, Technology & Applied Science Research*, vol. 8, no. 2, pp. 2770–2774, Apr. 2018, <https://doi.org/10.48084/etasr.1916>.