

ISO in the Construction and Manufacturing Companies: A Case Study from the Construction Industry of Hyderabad and Karachi, Pakistan

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ABSTRACT

Construction industry plays very important role in development of any country. The development of construction industry depends to a larger extent on quality of construction productions and projects. Quality of construction productions and projects is linked with the implementation of QMS (Quality Management System) in construction organizations. ISO certification is one of the QMS which has been adopted in manufacturing and construction industry at the global level. The construction companies of developing countries have reaped many advantages from the effective implementation of ISO standards. The rate of adoption of ISO standards has remained slow in the construction sector of some developing countries like Pakistan.

This paper presents the literature review of ISO in global construction industry. It highlights the advantages, disadvantages and barriers faced by construction companies in the implementation of ISO standards. This study also investigates the level of adoption of ISO standards in construction and manufacturing companies of Pakistan through a questionnaire survey. It presents the comparison of ISO standards' adoption in both construction and manufacturing sectors. The paper puts forward some suggestions and recommendation for the better adoption and improvement of ISO implementation in the construction sector of Pakistan. This study emphasizes that construction companies of Pakistan should learn from the benefits reaped by the construction companies of developed countries and take appropriate measures for implementing ISO standards. It also suggests that public sector clients should make it obligatory for the contractors and consultants to have ISO certification before awarding the works in order to enhance the adoption of ISO standards in construction sector.

Key Words: ISO Standards, Construction Companies, Quality Management.

1. INTRODUCTION

Quality is an essential element for sustainability and customer satisfaction [1]. Quality can be defined as meeting the legal, aesthetic and functional requirements of a project [2]. In the last few decades, increased attention was paid to quality

management at global level more specifically in manufacturing sector. The developed countries like Japan, USA and UK introduced ISO standards in their organizations. Gradually the same trends were adopted by construction sector in developed countries. Inspired

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from the successful implementation of ISO standards in developed countries, the manufacturing and construction organization of developing countries also started the adoption of ISO standards. As the nature of construction process and construction projects is different than the manufacturing, hence the pace of implementation of ISO standards is slow in construction sector. Therefore, presently more attention is being paid to the adoption of ISO standards in the construction sector of developing countries.

ISO offers a variety of benefits to the construction industry. These benefits include: improved quality, better productivity and good market image [3]. As compared to manufacturing industry, the construction sector of Pakistan is considered as backward because of its reluctance in adopting new technology and better management procedures [4]. In the last decade many construction companies of developed countries has implemented ISO-9000 management system as a first step towards total quality management [5]. The rate of adoption of ISO-9000 standards seems to be slow in the construction sector of Pakistan. This study therefore, investigates and compares the level of adoption of ISO standards in the construction and manufacturing companies of Pakistan. The case of two major cities, Karachi and Hyderabad are taken as a case study. It also examines the advantages, disadvantages and barriers observed by construction and manufacturing companies in the implementation of ISO standards.

2. OBJECTIVES OF THE STUDY

The main objectives of this study are:

- To study the advantages, disadvantages and barriers faced by construction companies in global construction industry through an extensive literature review.
- To investigate and compare the level of adoption of ISO in the construction and manufacturing companies of Pakistan.
- To highlight the advantages and obstacles in the implementation of ISO standards in construction and manufacturing companies of Pakistan.
- To put forward some suggestion for the acceptance, adoption and effectiveness of ISO standards in construction companies.

3. LITERATURE REVIEW

Various studies which have been conducted in global construction industry present different aspects of ISO certification for construction companies. These aspects include: main reasons for ISO certification, obstacles in implementing ISO standards and advantages of implementing ISO standards. Some of the above aspects are mentioned in Tables 1-3.

TABLE 1. MAIN REASONS FOR OBTAINING ISO CERTIFICATION BY CONSTRUCTION COMPANIES

Author	Aim/Topic	Main Reasons for ISO Certification
Turk, A.M. [6]	ISO 9000 in construction	- Due to the condition of public sector authorities. - As a tool to attract potential customers.
Dissanayaka SM et. al.[7]	Evaluating outcomes from ISO 9000-certified quality systems of Hong Kong constructors	- As an obligation of their customers.
Tat Y. Lee [8]	The development of ISO 9000 certification and the future of quality management	- Customers' pressure for getting ISO 9000 certification.
Ofori G. et. al. [9]	Implementing environmental management systems in construction	- To enhance the competitive power of the firm. - To improve the image of construction firm

The international study which compares the performance of US, UK and Japanese contractors concludes that the Japanese superiority in quality performance is actually due to their high perception of implementing quality management system. In this study it was observed that the percentage of Japanese ISO certified contractors was more as compared to US and UK contractors [14]. The above facts reveal that ISO certification has a significant impact on the construction quality performance of construction companies in global construction industry.

4. ADOPTION AND IMPLEMENTATION OF ISO STANDARDS IN CONSTRUCTION COMPANIES OF PAKISTAN

Considering the above mentioned importance of ISO in global construction industry, it is essential to study the adoption and implementation of ISO for the construction companies of Pakistan. In order to achieve this objective a

questionnaire survey was carried out in two major cities of Pakistan. The data was collected from construction and manufacturing companies. In manufacturing sector, the steel and cement manufacturers were selected because these products are used in construction. Total 80 questionnaires were distributed to consulting, contracting and manufacturing companies. 51 companies responded to the questionnaire. The statistics of respondents is depicted in Fig. 1.

5. RESULTS OF QUESTIONNAIRE SURVEY

In most of the cases the numbers represent the number of companies who have responded to the questionnaire; in other cases a percentage is used. The term construction companies refer in this study to consultants and contractors. The results of the questionnaire survey are mentioned below:

TABLE 2 MAIN OBSTACLES IN THE IMPLEMENTATION OF ISO STANDARDS

Author	Aim/Topic	Main Obstacles in the Implementation of ISO standards
Chew, Y.S., and Chai, L.N., [10]	ISO 9002 in Malaysian Construction Industry	- Lack of management commitment. - Employees' resistance to accept change. - Lack of continuous training.
Bubshait, A.A., et. al. [11]	ISO 9000 quality standards in construction	- Increased amount of paper work. - Additional work load. - High costs of certification.

TABLE 3. ADVANTAGES OF IMPLEMENTING ISO-9000 STANDARDS IN CONSTRUCTION ORGANIZATIONS

Author	Aim/Topic	Main Advantages of Implementing ISO 9000 standards
Chew, Y.S., and Chai, L.N., [10]	ISO 9002 in Malaysian Construction Industry	- Optimization of resources usage. - Good communication in different departments. - Better tractability of quality problems. - Reduction in material wastage. - Improvement in work quality. - Less repeated work. - Improvement in defective work at early stage.
Yates, J.K., and Anifto, S., [12]	International standards and construction	- Advantage of winning new projects. - Lead over the competitors.
Chini, A.R., and Valdez, H.E., [13]	ISO 9000 and the US construction industry	- Development of in-house management. - Use as a marketing tool.
Lee, T.Y., [8]	The development of ISO 9000 certification and the future of quality management	- Better team spirit. - Less staff conflicts. - Increasing efficiency. - Improved business - Less customer complaints.

- As depicted in Fig. 2 the results indicate that only 12% of the construction companies surveyed in this study are ISO certified, whereas all manufacturing companies who responded to the questionnaire are ISO certified. The results reveal that level of adoption of ISO standards is low in construction companies as compared to manufacturing companies.
- Most of the construction companies who have not implemented ISO, are of the opinion that ISO implementation will not help them in gaining any market benefit and it will merely be a wastage of money. All the respondents related to manufacturing are ISO certified.
- 80% of the certified construction companies are ISO-9001 certified and 20% companies have both ISO-9001 and ISO-14000 certification. The results reveals that construction companies are also adopting ISO-14000, indicating a trend towards environmental management.
- 89% of the manufacturing companies are ISO-9001 certified; other 11% are ISO-14000 certified. The results indicate that majority of the

manufacturing companies have ISO-9000 certification.

- 60% of the ISO certified construction companies have got certification during the year 2006-2008; 20% companies during 2003-2005 and remaining 20% before year 2000. These results show an increasing trend of ISO certification during 2006-2008.
- 87% of the manufacturing companies have got certification during 2006-2008 and 13% before 2000. These results also indicate an increasing trend of ISO certification during 2006.
- The most important factors to implement ISO standards in construction companies are chief executive's initiative and the demanding customers. Whereas the most important factors to implement ISO standards in manufacturing firms are increasing demand from customers and the pressure from the competitors. The results reveal that "increasing customers' demand" is the common and one of the important factors for implementing ISO Standards in construction and manufacturing companies.

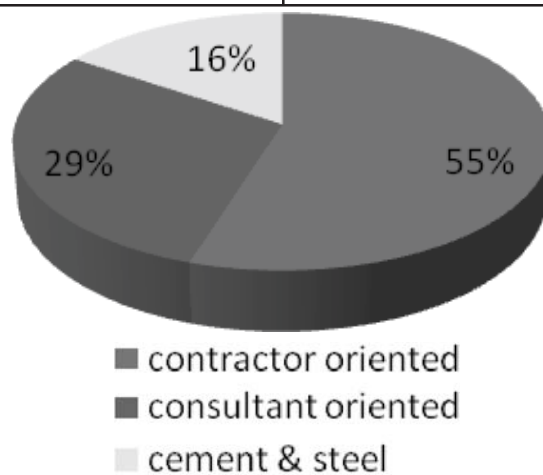


FIG. 1. THE PERCENTAGE OF RESPONDENTS

- 60% of construction companies say that their service quality has improved after implementing ISO standards, whereas 40% of the respondents state that their service quality has slightly improved after implementing ISO standards. On the manufacturing side, all the respondents say that their service quality has improved after implementing ISO standards. The results are portrayed in Fig. 3
- Most of the respondents from construction sector say that the major benefit achieved after ISO implementation is business expansion, while some of the respondents state that after implementing ISO standards their market image has improved.
- Majority of the respondents from manufacturing sector say that the major benefit achieved after ISO implementation is, improved market image, while some of the respondents say that their business has expanded after implementing ISO standards. The results reveal that 'improved market image' and 'business expansion' are the common benefits achieved by construction and manufacturing sector after implementing ISO standards.

- As shown in Fig. 4, 50% of the respondents from construction sector say that 25-50% of their customers ask for ISO certification. On the manufacturing side 62% of the respondents say that 25-50% customers ask for ISO certification. The results indicate that majority of the respondents from construction and manufacturing have the same observation.
- According to the results presented in Fig. 5, 40% of the respondents from construction sector say that their organizational competitiveness has improved up to 25-50% after implementing ISO. 50% of the respondents from manufacturing sector say that their organizational competitiveness has improved up to 25-50%. The results indicate that the observation is almost same in both the construction and manufacturing sector.
- The obstacles in the implementation of ISO standard observed by most of the construction companies according to level of importance are mentioned below:
 - ◆ Lack of top-management commitment
 - ◆ Lack of education and training
 - ◆ Increased paperwork
 - ◆ Lack of employee commitment

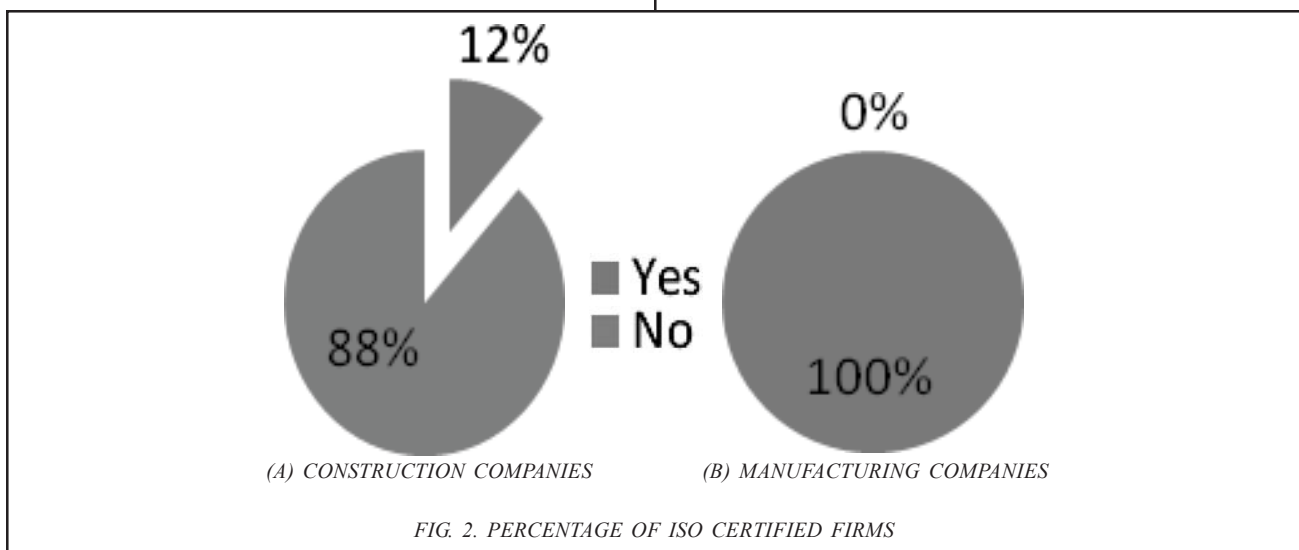


FIG. 2. PERCENTAGE OF ISO CERTIFIED FIRMS

□ The obstacles in the implementation of ISO standard observed by most of the manufacturing companies according to level of importance are mentioned below:

- ◆ Lack of education and training
- ◆ Increased paperwork
- ◆ Lack of top-management commitment

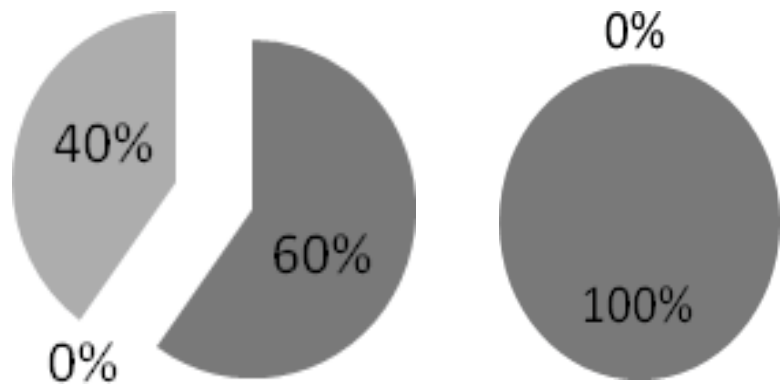
□ The results reveal that Lack of top-management commitment is the most important obstacle in the implementation of ISO standards in

construction companies. Where as in manufacturing companies, it is the lack of education and training.

6. DISCUSSION

□ The rate of adoption of ISO standards is low in construction companies as compared to manufacturing companies. Based on this result it can be concluded that still significant percentage of construction companies do not realize the importance of ISO certification.

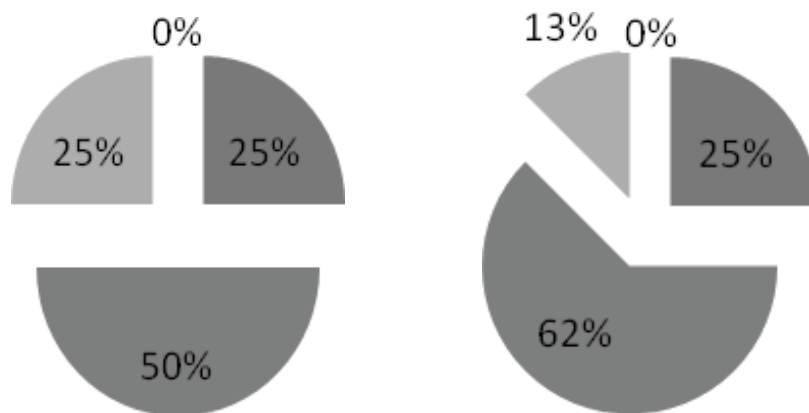
■ (a) Improved ■ (b) Remained same ■ (c) Slightly improved



(A) CONSTRUCTION COMPANIES (B) MANUFACTURING COMPANIES

FIG. 3. SERVICE/PRODUCT QUALITY AFTER IMPLEMENTING ISO STANDARDS

■ (a) 0-25% ■ (b) 25-50% ■ (c) 50-75% ■ (d) 75-100%

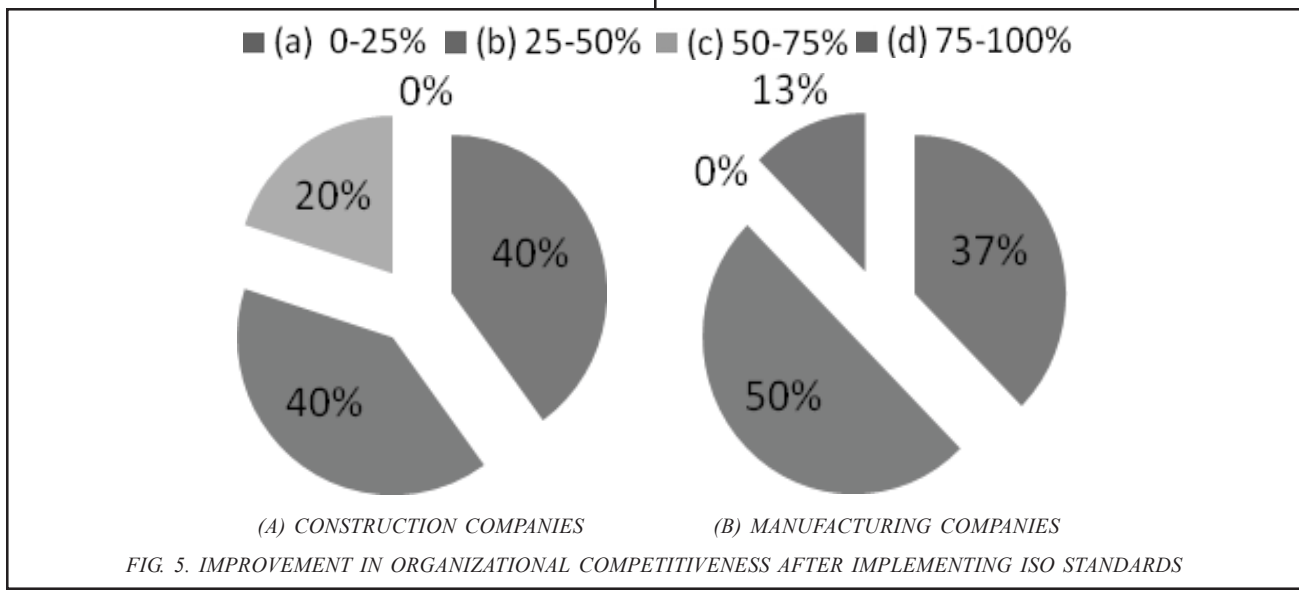


(A) CONSTRUCTION COMPANIES (B) MANUFACTURING COMPANIES

FIG. 4. CUSTOMERS DEMANDING ISO CERTIFICATION

- ❑ Most of the construction companies have a preception that ISO certification will not help them in gaining any market benefit and it will be just wastage of money to invest on its' implementation. Which seems to be a wrong perception.
- ❑ Some ISO-9001 certified construction companies have also ISO-14000 certification, which shows a good trend towards environmental management.
- ❑ The results indicate that a significant percentage of construction and manufacturing companies have got certification after year 2006, which is a sign of increasing trend of ISO certification in recent years.
- ❑ Chief executives' initiative is the most influential factor in the adoption of ISO standards in construction companies. In manufacturing companies it is mainly due to the pressure from competitors. Where as the common influential factor in both construction and manufacturing companies is the 'increasing demand from customers'.

- ❑ Majority of the construction companies observe that their service or product quality has improved after the implementation of ISO. On the manufacturing side all companies observe that their service or product quality has improved. Based on this result it can be concluded that ISO implementation is beneficial in the improvement of service and product quality.
- ❑ The results reveal that both construction and manufacturing companies have gained some common benefits after ISO certification which includes: improved market image and business expansion. Based on this observation it can be concluded that ISO certification is beneficial to companies in terms of developing better market image and growth of business.
- ❑ Significant percentage of both construction and manufacturing companies observe that their organizational performance has comparatively improved after ISO implementation. This result leads to the conclusion that ISO standards are also helpful in improving organizational performance.



□ The main obstacles observed by both construction and manufacturing companies in the implementation of ISO standards are:

- ◆ Lack of top-management commitment
- ◆ Lack of education and training
- ◆ Increased paperwork
- ◆ Lack of employee commitment

This result leads to the conclusion that in order to enhance the rate of adoption of ISO standards these obstacles may be addressed properly.

7. CONCLUSIONS

Based on the literature review and the case study presented in this paper, following conclusions are drawn:

(i) The main advantages of obtaining ISO certification by construction companies in global construction industry are:

- Advantage of winning new projects
- Improvement in work quality
- Good communication in different departments
- Optimization of resources usage
- Development of in-house management
- Less customer complaints

(ii) The main obstacles in the implementation of ISO standards observed by construction companies in global construction industry are:

- Lack of management commitment
- Employees' resistance to accept change
- Lack of continuous training
- Increased amount of paper work
- High costs of certification

(iii) The rate of certification of construction companies surveyed in this study is very less as compared to manufacturing companies. Most of the construction companies who have not implemented ISO standards, perceive that investment in ISO implementation will not be beneficial for them.

(iv) The construction and manufacturing companies have benefited from the adoption of ISO standards. One of the most important advantages they have achieved is "improved product/service quality".

(v) There are some barriers in the adoption of ISO standards, faced by both construction and manufacturing companies. One of the main obstacles observed is "lack of management commitment".

8. SUGGESTIONS

Based on the survey results, discussion and conclusions presented in the preceding sections, some suggestions are made for improvement in the adoption and implementation of ISO standards in the construction companies of Pakistan.

(i) Steps should be taken to enhance the awareness of ISO in construction sector so that companies can understand the importance of ISO standards. Many construction companies still have a wrong perception that investing in ISO certification is just wastage of money. Proper awareness program is necessary to change this misconception.

(ii) The chief executives of the companies should take the initiative for the implementation of ISO standards because this study indicates that, chief executives' initiative is the most influential factor in the adoption of ISO standards.

- (iii) One of the important obstacles in the adoption of ISO is lack of education and training, therefore, proper education and training programs should be carried out.
- (iv) Organizational culture should be improved in order to provide a good base for the implementation of ISO standards.
- (v) There should be legislation by the government regarding the obligatory requirements for the implementation of ISO standards by construction companies.
- (vi) Public sector organizations should make it obligatory for the contractors and consultants to have ISO certification.
- (vii) The construction companies of Pakistan should learn from the benefits reaped by the construction sector of the developed countries and take appropriate measures for implementing ISO standards.
- (viii) The results presented in this paper are based on the questionnaire survey from construction and manufacturing companies of two major cities of Pakistan. However, this kind of study should be carried out at the macro level to analyze the adoption of ISO standards.

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