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ISO 9000 in construction: An examination of its application in Turkey

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Abstract

ISO 9000, the quality management system standards developed by the International Standards Organization (ISO), is widely used in the construction industry, as it is in all industries in the world. Recently, a growing interest has been paid to the use of this system in the construction industry. Despite the growing interest, ISO 9000 use of construction firms has not been sufficiently studied from the perspective of developing countries. In this article, with regard to the ISO 9000 quality management system (QMS) in Turkey, the characteristics of contractor firms in the construction industry, the perceptions, behavior and experiences of the firms in regard to ISO 9000 QMS are discussed. A field study has been executed, and a questionnaire has been carried out. In total, 138 construction firms, members of Turkish Contractors Association and representing the top-level firms operating both in Turkey and in the international market, have been selected for this study. The evaluation of the data points to the fact that the surveyed construction firms generally have a positive approach toward ISO 9000 QMS and that ISO 9000 QMS provides important advantages for the firms. However ISO 9000 QMS cannot be made widespread and applied effectively due to certain disadvantages and difficulties in practice.

Keywords: ISO 9000; Quality management system (QMS); Standards; Construction

1. Introduction

In the construction industry, quality is defined as meeting the requirements of the designer, the contractor, the regulatory agencies and the project owner [1]. The term ''high quality building project'' reminds us of factors like the design being easily understandable and applicable, conformity of the design with specifications, economics of construction, ease of operation, ease of maintenance and energy efficiency [3]. In the construction industry, it is a rule that projects must be completed within the planned cost, at the scheduled time and at the required quality level. Quality may sometimes be ignored in the construction industry in order to cut the costs and/or shorten the project term. Quality assessment is provided through quality assurance and quality control in the construction industry. Quality assurance refers to the system controlling the provision of a product or service for the purpose of satisfying the customer needs [2]. Construction quality control means the specific application of the quality assurance program and its related activities [3]. In this framework, ISO 9000 QMS standards have been widely used in the construction industry in recent years as in all industries of the world. As a result, a growing interest has appeared in the literature with respect to the use of ISO 9000 QMS in the construction industry. Various studies have been carried out for ISO 9000 applications in European, Asian and North American countries in the construction industry [4–16]. In these studies, it is questioned whether ISO 9000 QMS is an appropriate tool for the construction industry, or, more specifically, for the construction firms. In the studies, the advantages and disadvantages are presented on equal terms and the constraints in application are identified. However, the use of ISO 9000

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QMS in construction firms has not been sufficiently studied from the perspective of developing countries. That is, very few studies have been produced to-date for ISO 9000 applications within the construction industry using examples from developing countries. The purpose of this article is to put forth the contractor firm characteristics in the construction industry related to ISO 9000 QMS in Turkey, and to find out the perceptions and behavior of the firms and the firms' experiences. The contribution expected from this study are taking the guidance of the knowledge and experiences attained to make widespread the ISO 9000 QMSs and use them in relevant applications in the construction industry at both the domestic and the international level.

Extending and applying ISO 9000 QMS for the construction industry in Turkey is important for three aspects. The first aspect is that the construction industry, as in all other countries, is an important economic activity in the Turkish economy. It is accepted as one of the leading industries of the Turkish economy since this industry is based largely on domestic production, and has a wide employment potential, an intense input-output relationship with other industries, especially the manufacturing industry, and brings in foreign exchange with the contractors' projects that are carried out abroad. The construction industry, which works with relatively labor-intense technology and plays an important role in the reduction of unemployment, has a 6% share on average within the total employment picture [17]. It is estimated that the construction industry also has a 6% share on average in the GNP generated in the Turkish economy with respect to production, and this share has risen to 33% with the contribution of other industries that operate in conjunction with the construction industry. As the construction industry is directly related to fixed capital investments, the growth of the construction industry affects the rate of growth in the national economy. The construction investments generally constitute 60% of the total investment amount realized in Turkey [17]. In the economy, besides the construction investments realized by private and public sectors, international contracting services are also important. The contractors who undertake international construction projects do not only provide foreign exchange to the country in terms of profit transfer or the money earned by the employees of the firms, but also contribute largely to the balance of payments through construction materials, machinery and equipment export. It will be useful for the Turkish construction sector to apply QMS effectively and widely in order to strengthen its position in the international market, to have access to new job opportunities, and to improve its image.

Secondly, application of QMS especially by contractors in the domestic market will be useful in order to restore their images distorted particularly due to the major earthquakes that occurred recently. As a matter of fact, the devastating loss of life and property in these earthquakes occurring in 1999 in Turkey has adversely affected the image of the construction industry as a whole. Nearly, 93% of Turkey is located in an active seismic zone. Nearly, 98% of the population lives in settlement units that involve an earthquake risk. In total, 61% of dwelling losses, the highest rate of dwelling loss in natural disasters, is caused by earthquakes. The economic losses caused directly by the earthquakes are approximately 3% of the GNP [18]. It is a known fact that this rate amounts to 7% with the addition of the indirect losses. Despite rapid transition and the ability to adapt to new technologies in the construction sector in Turkey, the performance of building inventory against natural disasters causes great concern. The concerns about the duration and cost of construction may override the quality of construction much of the time. Therefore, it will be constructive if the use of ISO 9000 QMS in the domestic market increases.

The third aspect is Turkey's adaptation process to the European Union. In particular, the extensive use of ISO 9000 QMS and standardization in the construction industry in member countries of the European Union [19] may require the use of ISO 9000 QMS especially for contractors in the construction industry in Turkey, a country aiming to be accepted to the European Union. In order for Turkish contractors to have a more effective position in both the domestic and international construction market, QMS should be established and used extensively and effectively in the construction industry as well as in all industries. This application and sustainability of QMS will increase the quality of construction projects in Turkey. In addition, it will make it easier to adapt to the systems of developed countries and may strengthen the position of the construction industry in the international market.

When all these national and international activities in the Turkish construction industry are taken into consideration, the studies that probe the experiences and opinions of the firms on the use of ISO 9000 QMS are not sufficient. In a thesis study in 1998, a survey carried out on a very limited number of firms (22 firms) in the construction sector revealed that almost all firms have grasped the importance of having a quality system, but they do not have enough experience on how to apply the system correctly, and experience problems on issues such as documentation, communication, training and process development [20].

In the first part of the paper, a literature survey has been performed with respect to ISO 9000 QMS applications in the construction industry. In addition, a theoretical infrastructure has been set up in connection with ISO 9000 QMS applications and the existing situation of construction firms in Turkey. The second