An Investigation the Current Situation of implementing ISO 9001 Quality Management System in Construction Sector in Erbil City-Iraq

● **Dr. Khalil Ismail Wali**[1] - Assist. Prof. ●
Bnar Naaman Hamadameen[2]- MSc.

[1,2] University of Salahaddin, College of Engineering, Civil Department
bnarnuhman90@gmail.com, kiwali2014@gmail.com

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Abstract

The purpose of this study is to investigate the current situation of implementation of a quality management system (QMS) based on ISO 9001 in construction sectors (private and public) in Erbil city. This study focused particularly on main motivation for adopting ISO 9001Certification and benefits as well as obstacles facing the implementation of ISO 9001 QMS in construction private and public sector. A questionnaire has been designed for the purpose of data collection. The findings of the questionnaire indicated that the most significant motivation factors for obtaining ISO 9001Certification were to improve the company's image and reputation, to satisfy customer requirements and expectation, to improve the quality of construction processes. While the most valuable benefits obtained from ISO 9001 Certification were improving awareness of company's objectives and policies, improves company image and reputation, and documentation and standardization of process and procedure of the projects. Whereas the major obstacles facing the implementation of ISO 9001 QMS were no existence of government regulations for mandatory implementation, lack of top management support and commitment, and inadequate employee's culture toward quality.

Keywords: Quality Management System, ISO 9001, Erbil City.

1. Introduction

In the construction industry, the projects should be completed within the specified cost, time and quality as in the contract, quality assessment provided throughout quality assurance and quality control. Quality assurance concerns to the system controlling the provision of a product or service for the reason of fulfilling the customer requirements. Construction quality control represents the application of the quality assurance program and its related activities (Turk, 2006).

Quality management system (QMS) is a set of interrelated processes designed and executed for the purpose of meeting customer requirements. QMS can be defined as the system to manage customer requirements (Alolayan, 2014) .International organization for the standardization (ISO) has authorized a technical committee, called Technical Committee (TC176), including of 162 members from different countries to be responsible for preparing, establishing, documenting, and maintaining the ISO 9001 standard document. ISO first published ISO 9001 International Standard in 1987, and since then it has become a major dimension of the quality movement and a key management framework for all type of organizations worldwide(Fonseca, 2015). From 1987 until today the standard has been revised four times. The latest one which is being used worldwide is the ISO 9001:2015(Fonseca and Domingues, 2017).

Because of the severe competition in today's world market oblige organizations to practice and follow a number of management systems and philosophies including ISO 9001 to examine how to improve the quality of products and services as they seek to increase their competitiveness, ISO 9001 is a series of standards that are generic, not specific to products or services and all types of organizations can be used to make sure that a particular quality of a product or service is consistently met (Ashrafi and Bashir, 2011).

To adopting of ISO 9001 QMS Certification, an organization has its QMS audited by an independent certification body, to access if it

satisfies ISO 9001 requirements and attains the intended results. The certification body should prove that it has competent management and staff and that it is impartial and free from conflicts of interest. The accreditation bodies audit certification bodies against ISO17021standard and an accredited certification body should meet the applicable requirements and make confident to its stakeholder (Fonseca and Domingues, 2017).

At any construction firm, a formal QMS has the possible to change attitudes, cultures, and work procedures in a way the organization has never practiced before. In most cases, in order to set up a formal quality management system at a construction firm, there have to be direct demands from their customers, whose requirement for quality is essential for doing business. Most of the construction organizations will not enter into the cost and allocation of resources to implement a quality management system unless they will be compensated.(Farooqui and Ahmed, 2009) .

The effective implementation of ISO 9001 QMS in construction companies requires appropriate and full implementation of the system to allocate companies to improve the method they manage and operate, in this way increasing profitability and market share, improving employee and customer satisfaction, and producing innovative and sustainable construction products and services (Trigunarsyah et al., 2011).

1.1. Motivate for Adopting of ISO Certification

Many number of reasons motivates different organizations for obtaining ISO 9001 Certification, Zaramdini (2007) analyzed the different aspects of the motives and benefits of ISO 9001Certification in 2000 companies in the United Arab Emirates, the findings specified that certified companies were more concerned with internal reasons like improving processes or products than by external reasons like pressure from customers or imitation of competitors.

Sampaio et al. (2011) categorized motivation of ISO 9001 certification to internal and external motivations, internal motivations are associated with the objective of attaining organizational improvement, while external motivations are mostly related to promotional and marketing issues, customer pressures, improvement of market share, etc.,

Gotzamani and Tsiotras (2002) also stated that companies seeking ISO 9001 certification mainly based on external motivations will also attain mostly external benefits, while those that obtain certification based on true quality improvement will get benefits mainly in terms of internal operations improvement.

Van der Wiele et al. (2000) showed that external motivations are positively correlated with customer relationships and organizational control, and these internal motivations were found to be positively correlated not only with customer relationships and organizational control but also with financial aspects and market share.

Terziovski et al. (2003) also observed that, the internal motivations for certification have a highly significant effect on business performance and the reduction of waste.

Arauz and Suzuki (2004), studied 292 companies which ISO 9001 certified in Japan, confirmed that internal motivation was the critical factor in terms of cost and quality performance.

Construction firms usually obtain ISO 9001 QMS standards in order to satisfy their customers, optimize the firm's resources, and to manage the targeted for internal quality procedures. However, in reality, many construction firms attain this certification due to the request of their customers or as a condition of the public tender authorities. On the other hand, there are many firms consider that using ISO 9001 certification is to gain a reputation aimed and as a tool to attract potential customers(Turk, 2006).

1.2. Benefits of ISO 9001 Certification

Different authors studied the benefits of ISO 9001 certification ,Casadesús et al. (2001) conducted a study to determine the benefits gets from application of ISO 9001 standard in Spanish companies and found that the most important internal benefits are improvement of definition and standardization of work procedures, improvement in the definition the responsibilities and obligation of workers ,increased company confidence in their quality, greater commitment to work and improved guidelines reducing improvisation whereas the main external benefits are better response to customer requirements,

penetration of new market, improved customer relation, improvement in customer services and reduction of customer audits.

Terziovski and Power (2007) tested the strength of the relationship between motivation for seeking ISO 9001 certification, quality culture, management responsibility, and the perceived benefits derived from ISO 9001 certification. Amongst the major findings is organizations that seek ISO 9001 certification with a proactive approach driven by a continuous improvement strategy are more likely to derive significant business benefits as a result. We also found that organizations can effectively use ISO certification as a means of promoting and facilitating a quality culture, where the quality auditor is an important player in the process.

Williams (2004) achieved that the most benefits of ISO 9001 Certification was documentation improvement, quality awareness increased ,improved customer relations, product reliability improved, and improved Systemization. Tarí et al. (2012) analyzed most benefits of ISO 9001 Certification which are improved efficiency and profitability, improved customer satisfaction, improved relationship with staff and image, other benefits analyzed for ISO 9001 are market share, sales, and product quality. Also Gotzamani (2005) identified the most valuable benefits of ISO 9001 implementation which was increasing customer satisfaction, improved company image, useful in tenders and increasing sales or market share.

1.3. Obstacles of Implementation of ISO 9001 Quality Management System

ISO 9001 certification may also present obstacles for its implementations, many researchers analyzed these obstacles, Zeng et al. (2007) explored the barriers to implementation of ISO 9001 in China, these barriers including short-sighted goal for "getting certified"; over-expectation on the ISO 9001 standard; mandatory requirement (not wholehearted commitment) in some industries; and following others (the trend) in certification and lack of necessary guidance for certification. Abdullah et al. (2013) investigated the main barriers of ISO 9001 implementation in local government (LG) organizations. The barriers are lack of cooperation among internal departments .They also defined two barriers categorized under the behavioral and cultural barriers, namely negative perception or attitude towards quality among employees, and employees' culture toward quality.

From a survey conducted by Erel and Ghosh (1997) found that the most common obstacles to ISO 9001 implementation are: "lack of understanding of its importance by all departments" and "unwillingness to change from the existing system" - followed by a procedural one - "difficulty in understanding the ISO 9001 requirements".

Zain and Kifayah (2002) identified most frequently barriers faced by the local organizations can be classified to human resource, attitude towards quality, management, culture, interdepartmental relations, machines and equipment, materials, quality related information, method, training, and finance. Gotzamani classified most important barriers in the new standard's implementation to the need to change the culture, the adaptation of "paper certificates", unrealistic requirements and ritualistic implementation, poor adaptation of the previous standard and conventional quality audit process.

1.4. Objective of the Study

The purpose of this study is to investigate the current situation of implementation of a quality management system based on ISO 9001in construction sectors (private and public) in Erbil city. This study particularly focused on main motivation factors for adopting ISO 9001Certification in construction private sector and benefits getting from ISO 9001 Certification .In addition obstacles facing the implementation of ISO 9001 QMS in public sector and private sector was studied.

2. Methodology

In order to achieve the main objective of this paper a questionnaire survey was conducted to investigate the main motivation factors, benefits, and obstacles from the implementation of ISO 9001 quality management system in the construction sector in Erbil city. The questionnaire designed as a simple and effective

way for the purpose of data collection, it consisted of five sections, first section solicited general information about organization/company and respondents, second section carried a knowledge about ISO 9001 Certification , while third and fourth section are related to the motivation factors for adopting ISO 9001 Certification and main benefits of ISO 9001 Certification respectively and final section regarding the obstacles facing the implementation of ISO 9001 QMS in construction sector in Erbil city.

The final draft of the questionnaire was then subjected to a pilot test involving four quality head and Auditor who had experience in implementing and auditing of ISO 9001, the pilot test was conducted within a two week. Through this pilot test, many comments to improve the content of the questionnaire had been propounded by the selected quality heads and auditor. Based on these comments, an amended final version of the questionnaire was then produced and utilized for the actual survey.

The Likert scale of five points was used in order to evaluate every question statement. For section three and section five which are the motivation for adopting ISO 9001 Certification and obstacles facing the implementation of ISO 9001 QMS in public sector, the scales were assigned values from one to five to indicate agreement or disagreement with the statement. While for section four the benefits of ISO 9001 Certification the scale designated values from one to five to determine the benefits from none benefit to extreme high benefit.

The companies with and without ISO 9001 Certification considered to fill the form of a questionnaire in construction private sector and organization with and without ISO 9001 Certification in the public sector also considered participating in filling the questionnaire .The questionnaire filled by a site visit and online sent by email to these companies . A total of 190 forms of questionnaire distributed, finally, a total of 165 form returned and completed. The answers listed in the returned questionnaires were collated and qualitatively analyzed using the Statistical Package for Social Sciences (SPSS) version 22 and Microsoft Excel 2013.

3. Result and Discussion

3.1. Study Area:

The study area covered the city of Erbil which is the capital of both Erbil Governorate and Kurdistan Regional Governorate; the area of Erbil Governorate is about 15074 km^2, with the population of 1612700 capita and geographically distributed of 24% rural, and 76% urban (all-population, 2018).

3.2. Analysis of Data

The analysis of data based on the calculation of score mean of each factor regarding motivation for adopting of ISO 9001 Certification, benefits of ISO 9001 Certification and obstacles facing the implementation of ISO 9001 quality management system computed according to equation (1).

$$M = \frac{\sum(f * s)}{N} \quad (1)$$

Where:

M = Score mean of factors (Motivations, Benefits, and Obstacles)

S =Score give to each factor by respondents ranging from 1 to 5.

f = Frequency of each rating (1-5) for each factor.

N =Total number of respondents.

3.3. Profile of Public Organizations, Private Companies and Respondents

The main information of profile of the organizations and companies in construction sector in Erbil city that investigated in this study is summarized in Table 1, it shows that the percentage of organization in public sector was 37.6% while the percentage of companies in private sector was 62.4%. The percentage of public organization and private companies which certified by ISO 9001 was 35.2% and not certified by ISO 9001 was 64.8%, the percentage of organizations and companies have been established more than 20 years was 49.1%. Additionally, the customer sector of almost all organizations and companies was government which was 40.6 %. Degree of education of most respondents was BSc with percentage of 92.7% whereas the percentages of respondents that have MSc and Diploma were 6.1% and 1.2% respectively. Additionally the maximum

percentage of respondents had qualification in civil engineering with 72.7% and most of the respondents 5 to 10 years had worked in these organizations and companies while maximum percentage of respondents (29.1%) had a role as a project manager in construction projects.

3.4. ISO 9001 Certification Information

This section only related to these organizations and companies which have ISO 9001 Certification, the study shows that the numbers were 17 companies(48 respondents) in construction private sector and 2 organization (10 respondents) in construction public sector in Erbil city. Table 2, represented all information about ISO 9001 Certification, as indicated that, the most well-known certification bodies was Russian register (17.2%) and SGS (15.5%) as well as Universal Register (15.5%), maximum percentage of companies and organizations certified by ISO 9001 Certification for the period of 1 to 3 years. The required time for preparation of ISO 9001 Certification as presented in Table 2 that (62.1%) of organization have a time for preparation less than 6 months while 20.7% of organization prepared for certification between 6 to 12 months. Additionally, 72.4% of organization have a consultant during adopting of ISO 9001 Certification and many of organization prepared the documentation by consultant only or quality assurance team with consultant.

3.5. Validity and Reliability

The validity analysis of the questionnaire instrument adequacy to what extent it measures the idea or concept which was planned to measure, content validity is considered in this study, it was depends on to what extent the researchers developed the measurement items to fully cover the content area of the variable being measured. Typically, it can be only measured subjectively by the researchers. The motives factors and benefits as well as the obstacles items were carefully selected from an extensive review of literature. Additionally, the validity of the lists of motives, benefits and obstacles statements was approved and confirmed by quality managers and Auditors during the initial testing stage. The internal consistency of a group of measurement items refers to the degree to which items in the group are homogenous. In this study, the internal consistency is estimated by using the Cronbach's alpha reliability coefficient. The Cronbach's alpha for the 17 motives items is equal to(0.872) and the Cronbach's alpha for 16 items of obstacles is equal to 0.837 both of them is (higher than 0.8), which suggests good reliability (Gliem and Gliem, 2003) ,moreover, the Cronbach's Alpha reliability coefficient tested for 35 items of benefits which is (0.916) greater than 0.9 , which recommends to excellent reliability (Gliem and Gliem, 2003) .

3.6. Motivation for adopting of ISO 9001 Certification

Table 3,shows the mean score , standard deviation and rank of mean of each motivation factors for adopting of ISO 9001 quality management system in construction sector in Erbil city, the most significant certification motive indicated by the respondents as a first rank was to improve company image and reputation and second rank was to satisfy customer requirements and expectation as well as the third rank was to improve the quality of construction processes and procedure with mean score 4.71,4.41,and 4.38 respectively. While the forth rank was to meet clients requests as a part of the bidding process and fifth rank was to achieve competitive for the international construction market with mean score 4.29 and 4.26 respectively.

3.7. Benefits of ISO 9001 Certification

The most important benefits that companies and organizations get from ISO 9001 Certification in construction sector in Erbil city as shown in Table 4, the most significant benefits coming in first rank was improves awareness of company's objectives and second rank was improves company image and reputation policies as well as the third rank was documentation and standardization of process and procedure of the projects with mean score 4.21, 4.12, and 4.0 respectively. In the fourth rank and fifth rank were quality improvement of services and products ,increasing customer satisfaction with the mean score 3.98 and 3.95 respectively.

3.8. Paired t-test

Paired t-test is used to compare means between two conditions, The relationship between the motives and benefits was investigated by analyzing the mean differences between the expected-perceived pairs of motives and benefits we tested the motivation and benefits of ISO 9001 Certification to determine that the motivation that the organizations expected from adopting of ISO 9001 Certification actually executed and this is appeared from the benefits that these companies achieved, as shown in Table 5, the result of the paired t-test for 5 paired ,all of them was (Sig.<0.05) indicated that there were no significant differences between mean of theses motivation and benefits, this signified that the organizations essentially get benefit that expected from adopting of ISO 9001 Certification.

3.9. Obstacles facing the implementation of ISO 9001 Quality Management System

This section of the questionnaire consisted of sixteen obstacles facing the implementation of ISO 9001 QMS in construction sector in Erbil, all the public organizations and private companies which ISO 9001 Certified and not certified participated in this section. Table 6, shows mean score and rank of mean for all the obstacle factors .The main top five obstacles have no regulation from government for mandatory implementation ,lack of top management support and commitment, inadequate employee's culture toward quality , absence of training and education to encourage employees to accept the values of QMS ,and absence of qualified and professional personnel in ISO Certification with the mean score of 4.22,4.05,4.05.4.02,and 3.99 respectively.

Figure 1, shows the difference between the obstacles facing the implementation of ISO 9001 QMS in public organizations and private companies in Erbil city. It can be noticed that the mean of all the obstacles from public organizations is greater than the mean of obstacles in private companies except the mean of increase in workload/paperwork in private companies is higher than in public organizations. It means that these obstacles from public organizations was more than the obstacles in private companies.

3.10. Comparison of top five motivation, benefits and obstacles factors of implementing ISO 9001 quality management system in various countries.

It is useful to compare the top five motivation, benefit obstacles factors of implementing ISO 9001 QMS of the current study in Erbil city with the other available study in different countries such as Turkey, Emirate, Japan, China, Spanish, Egypt and Malaysian. The result of these comparisons shows in Table 7, Table 8, and Table 9.

4. Conclusions

This paper studied the motivates and benefits of ISO 9001 Certification for the companies and organization that certified with ISO 9001 Certification in both construction public sector and construction private sector in Erbil city, in addition to investigated the obstacles facing the implementation of ISO 9001 quality management system in construction sector in Erbil city for public sector and private sector that certified or not certified with ISO 9001 Certification.

It is concluded that the percentage of companies in construction private sector that ISO 9001 certified was 46.6% whereas the percentage of companies in private sector not certified by ISO 9001 was 53.4%, as well as for public sector the percentage of organization that certified by ISO 9001 was 17.9% and percentage of organization not certified by ISO 9001 was 82.1%.

The most important (top five) motivation factors for adopting ISO 9001 Certification were to improve the company's image and reputation ,to satisfy customer requirements and expectation ,to improve the quality of construction processes and procedure ,to meet clients requests as a part of the bidding process ,and to achieve competitive for the international construction market with mean score of 4.71,4.41,4.38,4.29, and 4.26 respectively.

The most valuable benefits that companies and organizations acquired from ISO 9001 Certification associated with improving

awareness of company's objectives and policies ,improves company image and reputation ,documentation and standardization of process and procedure of the projects, quality improvement of services and products ,and increasing customer satisfaction with mean score of 4.21,4.12,4,3.98,and 3.95 respectively.

Paired t-test is utilized to determine whether the organization have a great motivation for adopting ISO 9001 Certification actually get benefit from certification or not .It is signified that the organizations obtained benefit from ISO 9001 Certification with relation to improve the company's image and reputation, increase customer satisfaction, enhancing and improving productivity, improve quality of services and products, and achieve competitive for the international construction market.

The major obstacles facing the implementation of ISO 9001 Quality Management System in public organizations and private companies were: no regulation from government for mandatory implementation ,lack of top management support and commitment, inadequate employee's culture toward quality , absence of training and education to encourage employees to accept the values of QMS ,and absence of qualified and professional personnel in ISO Certification with the mean score of 4.22,4.05,4.05.4.02,and 3.99 respectively.

Furthermore, mean of all the obstacles from public organization is greater than the mean of obstacles in private companies except the mean of increase in workload/paperwork in private companies is more than in public organizations. It signifies that these obstacles in public organization was more as compared with private companies.

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دراسة الوضع الحالي لتنفيذ نظام إدارة الجودة (ISO 9001) في قطاع البناء بمدينة أربيل

بنار نعمان حمد امين1 - ماجستير
د . خليل اسماعيل ولي2 - استاذ مساعد
[1, 2] جامعة صلاح الدين - كلية الهندسة - قسم الهندسة المدنية

المستخلص

الفرض من هذه البحث هو دراسة الوضع الحالي لتنفيذ نظام إدارة الجودة (QMS) على أساس ISO 9001 في قطاعات البناء (القطاعين العام والخاص) في مدينة أربيل. ركزت هذه الدراسة بشكل خاص على الدافع الرئيسي لاعتماد شهادة ISO 9001 وفوائد الحصول على شهادة ISO 9001 وكذلك العقبات التي تواجه تنفيذ ISO 9001 QMS في قطاع البناء الخاص والعام من خلال تصميم استبيان لفرض جمع البيانات. أشارت نتائج الاستبيان إلى أن أهم العوامل المحفزة للحصول على شهادة الأيزو 9001 هي تحسين صورة الشركة وسمعتها ، وتلبية متطلبات العملاء وتوقعاتهم ، وتحسين جودة عمليات وإجراءات البناء. في حين أن أكثر الفوائد قيمة والتي تم الحصول عليها من شهادة ISO 9001 كان تحسين الوعي بأهداف الشركة وسياساتها ، وتحسين صورة الشركة وسمعتها ، وتوثيق وتوحيد العمليات والإجراءات الخاصة بالمشاريع ، في حين أن العقبات الرئيسة التي واجهت تطبيق ISO 9001 QMS هي عدم توفيرالحكومة لائحة للتنفيذ الإلزامي ، وغياب الدعم الإداري من الجهات العليا ، والثقافة المحدودة للموظف فيما يخص الجودة.

الكلمات المفتاحية : نظام إدارة الجودة ، شهادة الأيزو 9001 ، الدوافع ، الفوائد ، العقبات.

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Table 1: Profile of Respondents and Organizations. (Source: Researcher)

Operating Sector type of organizations and companies	Percentage%	Degree of Education of respondents	Percentage %
Public sector	37.6	MSc	6.1
Private sector	62.4	BSc	92.7
ISO 9001 Certification		Diploma	1.2
ISO 9001 Certified	35.2	Qualification of Respondents	
Not certified	64.8	Civil Engineering	72.7
ISO 9001 Certification by operating sector		Mechanic	12.1
Private sector Certified	46.6	Other	15.2
Private sector not Certified	53.4		
Public sector Certified	17.9	Year of working of respondent in these organizations and companies	
Public sector not Certified	82.1	<5 Years	32.7
Operating years of organizations and companies		5-10 Years	38.8
<10 Years	16.4	11-15 Years	18.8
10-20 Years	34.5	16-20 Years	6.7
>20 Years	49.1	>20 Years	3
Major customer sector of organizations and companies		Role or Position of Respondent	
Government	40.6	Company Manager	9.7
Private	38.8	Quality Manager	9.7
Oil and gas	20.6	Project Manager	29.1
Type of contractor (main activities of organization)		Supervisor Manager	13.9
Civil	21.8	Site Manager	26.7
Building	15.2	other	10.9
Civil and Building	57.6		
Other	5.5		

Table 2: ISO 9001 Certification Information. (Source: Researcher)

ISO 9001 Certification Body	Percentage%	Years of Certified by ISO 9001	Percentage%
Russian Register	17.2	<1 Years	6.9
SGS (Société Générale de Surveillance)	15.5	1-3 Years	65.5
UR (Universal Register)	15.5	3-5 Years	24.1
TÜV (Technischer ÜberwachungsVerein)	10.3	5-7 Years	3.4
SAI GLOBAL	8.6	Using of Consultant services	
PECB (Professional Evaluation and Certification Board)	6.9	Yes	72.4
LMS(Linear Management Solution)	6.9	No	27.6
Intercert	5.2	Preparation of documentation for ISO 9001 Certification	
SWISS CERT PVT LTD	5.2	Every division and sun-division	5.2
other	8.6	Quality assurance team	22.4
Time for preparation of ISO 9001 Certification		Consultant	36.2
< 6 Months	62.1	Quality assurance team and consultant	36.2
6-12 Months	20.7		
1.5-2 Years	8.6		
>2 Years	8.6		

Table 3: Motivation for adopting ISO 9001 Certification in construction sector in Erbil city. (Source: Researcher)

Motivation Factors Description	Mean Score	Std. Deviation	Rank of Mean
To improve the company's image and reputation	4.71	0.45	1
To satisfy customer requirements and expectation	4.41	0.62	2
To improve the quality of construction processes and procedure	4.38	0.64	3
To meet clients requests as a part of the bidding process	4.29	0.85	4
To achieve competitive for the international construction market	4.26	0.66	5
To improve the overall company's management system	4.24	0.92	6
To improve the quality of services and products	4.17	0.90	7
To control and operate project activities effectively and efficiently	4.02	0.90	8
Improving communication within the company or organization	4.00	0.85	9
Decrease in incidents, rejection and complaints	4.00	1.00	10
Enhancing and improving productivity	3.91	1.03	11
Use it as a tool for marketing	3.90	0.94	12
A step toward total quality management	3.79	0.83	13
Improving the relationship between employees and management	3.66	1.14	14
Market share increasing	3.64	0.81	15
Reduction in internal and external cost of company or organization	3.47	1.14	16
Requested by the government	3.29	1.22	17

Table 4: Benefits of ISO 9001 Certification in Construction Sector in Erbil City. (Source: Researcher)

Benefits Factors Description	Mean Score	Std. Deviation	Rank of mean
Improves awareness of company's objectives and policies	4.21	0.64	1
Improvement of company image and reputation	4.12	0.77	2
Documentation and Standardization of process and procedure of the projects	4.00	0.70	3
Quality improvement of services or products	3.98	0.83	4
Increasing customer satisfaction	3.95	0.80	5
Clearer job description and responsibilities	3.91	0.60	6
Helped in continuous improvement	3.88	1.06	7
Fewer customer complaints	3.86	0.54	8
Clear work instruction	3.86	0.87	9
Improved the efficiency of the quality system	3.83	0.63	10
Improve strategic quality planning	3.79	0.67	11
Improves records and makes recovery of information easy in the situation of litigation.	3.74	1.18	12
Controls of quality problems effectively	3.66	0.87	13
Effective risk management	3.64	0.91	14
Excessive competitive advantage	3.62	0.79	15
Improve the performance evaluation of process and employees	3.60	0.77	16
Improvement of organization communication and have a communication procedure	3.60	0.90	17
Improve profitability	3.59	1.17	18
Higher sales (Market share)	3.55	0.84	19
Increase in operational efficiency	3.55	1.08	20
Better communication procedure related to customers	3.53	0.75	21
Improvement of work environment	3.52	1.05	22
Greater quality awareness of employees and share notices and information with its employees	3.52	0.71	23
Improved suppliers performance	3.50	0.96	24
Productivity increase	3.48	0.84	25
Effective and capable of identifying new opportunities	3.48	0.98	26
It is a basis to assistance of the project to be finished within the time frame specified in the contract, preventing project delays	3.47	0.88	27
Utilization of material resources more effectively	3.45	1.01	28
Elimination of non-value added work or preventing work repetition	3.43	0.86	29
Expansion to the international market	3.41	1.14	30
Reduction in wastage of materials and inefficiency	3.41	0.97	31
Decrease in internal and external costs of company	3.34	1.09	32
Improves communication between employees and management	3.33	0.94	33
Improves communication and relationship with the owner, subcontractors and engineer.	3.26	0.76	34
Development training to the subcontractors and workers	3.16	0.72	35

Table 5: The paired sample test for motivation and benefits of ISO 9001 Certification in construction sector in Erbil City. (Source: Researcher)

		Mean Diff.	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pair 1	To improve the company's image and reputation - Improvement of company image and reputation	0.586	0.879	0.115	5.07	57	0.000
Pair 2	To satisfy customer requirements and expectation - Increasing customer satisfaction	0.534	1.404	0.184	2.89	57	0.005
Pair 3	To enhancing and improving productivity - Productivity increased	0.431	1.125	0.147	2.91	57	0.005
Pair 4	To improve the quality of services and products - Quality improvement of service or products	0.258	0.806	0.105	2.44	57	0.018
Pair 5	To achieve competitive for the international construction market - Expansion to the international market	0.844	1.196	0.157	5.37	57	0.000

Table 6: The obstacles facing the implementation of ISO 9001 Quality Management System. (Source: Researcher)

Obstacle Factors Description	Mean Score	Std. Deviation	Rank of Mean
No regulations from government for mandatory implementation from private and public product/service providers.	4.22	0.64	1
Lack of top management support and commitment.	4.05	0.97	2
Inadequate Employees' culture towards quality	4.05	1.05	3
Absence of training, and education of employees to encourage employees to accept the QMS values.	4.02	0.77	4
Absence of qualified and professional personnel in ISO Certification.	3.99	0.97	5
Lack of strong motivation from all levels of management.	3.95	1.01	6
Absence of financial support for the implementation of ISO 9001	3.93	0.97	7
Lack of consulting boards.	3.84	1.01	8
Absence of necessary guidance for ISO Certification.	3.78	0.95	9
Difficulty in implementing the quality audit process	3.77	1.02	10
Increase in workload/paperwork	3.76	1.12	11
Lack of understanding the importance and benefits of ISO 9001 quality management system	3.67	1.06	12
Resistance to change	3.67	1.21	13
Short-sighted goal for "getting certified"	3.56	1.15	14
Difficulty in development of documentation	3.44	1.03	15
Lack of leadership.	3.38	1.32	16

Table 7: Comparison of top five motivation factors of using ISO 9001 QMS in various countries. (Source: Researcher)

	Current study in Erbil City-Iraq	Turkey (Turk, 2006)	Emirate (Zaramdini, 2007)	Japan (Arauz and Suzuki, 2004)	Spanish (Escanciano et al., 2001)
Top Five Motivation Factors	To improve the company's image and reputation	To entering to the international construction market	Improving productivity and/or efficiency	Improving corporate procedures and organizational standards	Improving product/service quality
	To satisfy customer requirements and expectation	It is compulsory for contract bidding	Reducing incidents, rejections and complaints	Improving corporate image	Improving internal process and procedures
	To improve the quality of construction processes and procedure	ISO 9001 certification will soon be mandatory	Use it as a basis for internal costs reduction	Satisfying customers' requests	Improving company image
	To meet clients requests as a part of the bidding process	Certification is necessary for the improvement of the management system of the company	Improving processes and procedures	Improving product/service quality	Mandatory to compete in the sector
	To achieve competitive for the international construction market	Company wants positive change and improvement	Improving product and/or service quality	Following the behavior of markets	Anticipating market trend

Table 8: Comparison of top five benefit factors of using ISO 9001 QMS in various countries. (Source: Researcher)

	Current Study in Erbil City-Iraq	Turkey (Turk, 2006)	Emirate (Zaramdini, 2007)	Egypt (Magd and Curry, 2003)	Spanish (Escanciano et al., 2001)
Top Five Benefit factors	Improves awareness of company's objectives and policies	Enhances company's image	Increased productivity and/or efficiency	Improves documentation	Better understanding of processes/ responsibilities
	Improvement of company image and reputation	Improves definitions of responsibilities in the company	Elimination of redundancy or unnecessary work	Improves the efficiency of the quality system	Employees become more quality aware
	Documentation and Standardization of process and procedure of the projects	Improves company's operating procedures	Reduced internal costs	Helps supplier selection	Improved employee training
	Quality improvement of service or products	Improves customer satisfaction	Improved product and/or service quality	Improves product/service quality	Improved product/service quality
	Increasing customer satisfaction	Increases productivity	Improved processes and procedures	Helps develop quality management	Reduction of level of failures

Table 9: Comparison of top five obstacle factors facing the implementation of ISO 9001 QMS in various countries. (Source: Researcher)

	Current study in Erbil City-Iraq	Turkey (Turk, 2006)	China, Zeng et al. (2007)	Malaysian Abdullah et al. (2013)
Top five Obstacles factors	No regulations from government for mandatory implementation	Registration process is too lengthy	Short-sighted goal for "getting certified"	Negative perception or attitude towards quality
	Lack of top management support and commitment.	ISO 9001 certification has increased the expenses	Over-expectation on ISO 9001 standard	Lack of cooperation among internal departments
	Inadequate Employees' culture towards quality	The company management is not open to research and criticisms	Mandatory requirement (not wholehearted commitment) in some industries	Employees' culture toward quality
	Absence of training, and education	Company management procedures have changed for implementing QMS	Following others (the trend) in certification	Lack of involvement, cooperation and commitment from employees
	Absence of qualified and professional personnel in ISO Certification	Lack of information about ISO 9001 QMS	Lack of necessary guidance for certification	Lack of time

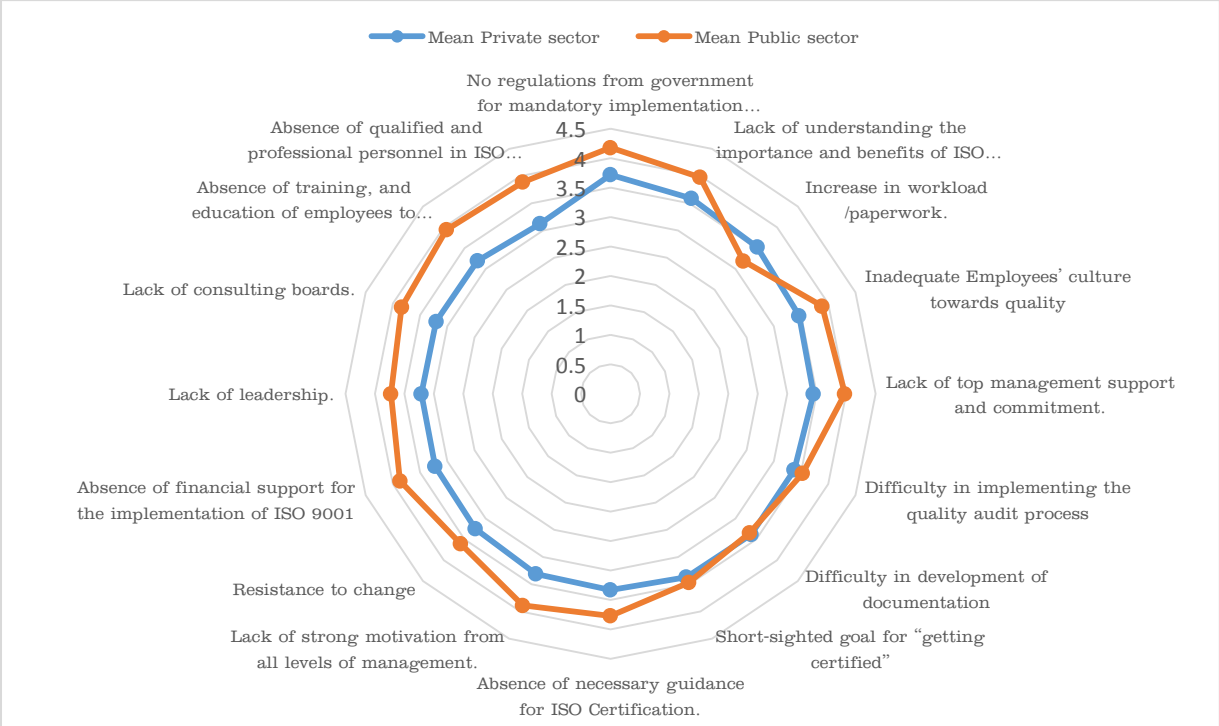

Figure 1: Obstacles facing the implementation of ISO 9001 Quality Management System in public organizations and private companies in construction sector in Erbil city. (Source: Researcher)