

# Evaluation Of Compliance with ISO 9001 Quality Management Principles by Construction Firms in Enugu State Nigeria

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**Abstract**— The study aims to evaluate the compliance of construction firms in Enugu State with ISO 9001 standards, with a view to identifying opportunities for improvements that can be implemented by the firms. The study adopted a questionnaire survey design aided by interviews and literature reviews. Findings of the study show that quality management policy exists in over 70% of the construction firms in the study area. However, while this percentage has quality management policies, others engage in quality management practices but do not have policy documents guiding their practices within their firm. Quality management policies of construction firms do not also completely comply with ISO standards. The “Focus on Customers” principle of quality management received the highest level of compliance while the “Continuous Improvement” principle received the lowest level of compliance with ISO 9001 standards. The study concluded by recommending that construction firms should always gain the commitment of their staff in the course of complying with ISO 9001 standards by motivating their employees with appropriate motivation schemes. It is also recommended that to sustain the level of compliance with ISO 9001 in a construction firm, the firm should further maintain a continuous improvement approach and always update its quality management policies.

**Index Terms**—ISO 9001, Quality management, compliance, Enugu State.

## 1. Introduction

The international standard organization (ISO, series 8402) defines quality management as the totality of features of a product, process, organization, person, activity, or system that bear on its ability to satisfy stated and implied needs. However, quality management in the construction industry is different from that in manufacturing or other service industries.

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Dada (2016) defines quality management in the construction industry as encompassing every stage of a project by stating that quality management covers all activities of integrating all procedures, processes, structures, and products to achieve quality in the finished project. Quality management is therefore, a major focus for construction project managers as the whole process involved in a project must be undertaken towards meeting the customer’s requirements and design standards.

An important area of concern in the construction industry in Nigeria is the increasing number of cases of collapsed buildings across the country (Abdulkareem and Adeoti, 2011). Failure or collapse of buildings is the result of poor design, adoption of wrong methods of construction use of substandard materials, use of faulty machinery, and so on. Oyegbile, Tat, and Olutoge (2012) reveal that over the last 10 years, the fatal incidence of building collapse in Nigeria has continued to reoccur without any indication of being reduced. According to (Oke, 2006), the effects of poor quality are always project abandonment, structural failure, building collapse, and other issues that may arise. In Enugu State, there have been cases of structural failure, project delay and abandonment, and building collapse. According to a report by DailyPost newspaper on 1st March 2014, a three(3) storey building under construction in Nsukka collapsed, trapping 7 persons. In another report by PUNCH newspaper on 20th August 2021, a three-story building also collapsed in Abapka-Nike, Enugu State, with no casualty recorded. In Another report by Vanguard newspaper on 5th April 2020, a three-story building collapsed along Agbani Road in Enugu South LGA. In June 2023, a two-storey building in Abakpa Nike also collapsed without any casualties. To control these causes, good quality management measures in building construction projects should be adopted. Compliance with ISO 9001 quality management principles by construction firms could bring an end to the needless loss of lives (Abdullahi, Bustani, Hassan, and Rotimi, 2019). Hence, the study aims to evaluate the compliance of construction firms in Enugu State with ISO 9001 quality management principles.

## 2. Overview of ISO 9001 Standards

Standards are documents used to define acceptable conditions or behaviors and to provide a baseline for assuring that conditions or behaviors meet the acceptable criteria. Standards are the key to any compliance assessment. The term ISO describes the series of international standards dealing with product design, production, delivery, and services. ISO 9001 standards describe principles of quality management and their requirements. These principles can be applied to all types of organizations both public and private sector, regardless of size or classification of industry. The principles are used to provide a sound foundation for achieving the quality goals and objectives of a construction firm. These principles include fact-based decision-making, focus on customers, good relationship management, continual improvement, process approach, involvement of people, and good leadership. These principles also guide construction firms in establishing their quality policy and plan as they clearly state the steps necessary to achieve desired standards.

The concept of quality management is an approach to ensure that all participants involved in quality management in a construction firm, work towards raising high-quality buildings. Compliance with quality management standards requires that all team players are actively involved. When the construction professionals involved in managing quality can set good quality management policies, with a high level of compliance with standards, enhanced quality of projects can be achieved. This involves compliance with quality management principles as outlined by ISO 9001. However, the mere existence of quality culture and policy in a construction firm does not necessarily guarantee the effective implementation of quality principles.

Mohammed, Misnan, Yusof, and Bakri (2006) undertook a study to investigate the issues of quality culture in the construction industry. The method adopted for the study is the use of a questionnaire. Descriptive statistical methodologies were used to analyze the data. The study identified nine important cultural elements that contribute to the successful application of quality management, these elements include; leadership and top management commitment; customer management; training and education; teamwork; quality planning and strategy; supplier partnership; process management; people management, and empowerment; rewards and effective communication. In another study by Jha and Iyer (2006) on critical factors affecting quality performance in construction projects. The data collected were analyzed using descriptive statistics. The critical success factors identified were: the project manager's competence; top management's support; monitoring and feedback by project participants; interaction among project participants; and owners' competence. According to Kubr (2004), the leadership must be committed to the QM and be the driving force by creating visions that will take the organization from its current position to where it wants to be. Ahuja and Khamba (2002), also stated that top management can influence the achievement of

manufacturing performance advancements by putting in place structures for implementing quality management principles, setting up just reward and recognition structure in the organization, and ensuring that resources for managing change in the organization are available on time.

In the same vein, Low (2010) in his research outlined the following basic framework for implementing quality management in construction firms namely: customer feedback system, continuous improvement, encouraged teamwork, reduced number of suppliers, process management and improvement through productivity study, effective communication system, top management, review organizational culture, produce training plans, establish monitoring process. The study proposed 6 critical success factors (CSFs) of quality for the construction industry, namely, Top management commitment, Customer Satisfaction, Employee Involvement, Human Resource Management, and Process Improvement. These and other factors when well planned for, make quality management more realistic in any construction firm. Psomas, Dimitros, and Katerina, (2015) recommend that the top management must make sure that an organization's inspiration for executing quality standards emanates from within and not from without. This understanding and appreciation should be obtained through appropriate training and experience.

Several researchers in the area of quality management have also outlined factors that hinder compliance with quality management policies in construction firms. Turk (2006) noted that the development of an ISO 9001-certified quality management system requires a huge amount of written documentation and needs a long time to integrate into a company's management system, leading to potential substantial increases in operating costs. This high cost of quality makes it difficult for firms to adopt quality management standards.

In a study by Nurcahyo, Zulfadlillah, and Habiburrahman (2021), on the Relationship between ISO 9001:2015 and the operational and business performance of manufacturing industries in a developing country (Indonesia), data collected were analyzed using frequency counts, and multiple linear regression analyses. The study reveals major obstacles in the effective implementation of ISO 9001 in the manufacturing industry including lack of qualified personnel, inadequate training, employee resistance, and lack of commitment among top-level management executives. While the study by Nurcahyo et al was conducted within the manufacturing industry in Indonesia, the current study was conducted in the construction industry in Enugu State, Nigeria.

According to a study by Sadikoglu and Olcay (2014) which examined the effect of total quality management on performance and the barriers to total quality management practice, the results uncovered that essential snags that the organizations in Turkey confront were an absence of worker contribution, mindfulness and responsibility of the representatives, wrong firm structure, and absence of adequate resources. It is suggested that organizations should proceed

with implementing quality management with all variables to enhance performance.

The relevance of quality management practice in building projects cannot be over-emphasized as it sets the minimum standards for the construction of buildings intending to ensure the quality, safety, and proficiency of our building industry. The ISO 9000 standards have provided and continue to provide a good foundation on which competent and beneficial quality management policies can be built in the construction industry. In another study by Bankole (2019) quality management practices of contracting firms in building project delivery. The study adopted a quantitative research method with the use of a questionnaire to collect data from the respondents. Findings from the study revealed that the top-ranked benefit of quality management practices of contracting firms is the improvement in company reputation. Hoyle (2009) asserts that when applied correctly these standards will help organizations develop the capacity to create and retain satisfied customers in a manner that satisfies all the other stakeholders.

The quality management system establishes a framework of reference points that ensure that every time a process is performed, the same information, methods, skills, and controls are used and applied consistently (Dale, 2003). Essentially a quality management system standardizes organisations' processes, helps to minimize waste and reworks, and increases organisations' profit margin (Wilkinson and Scofield, 2010). As construction firms are encouraged to comply with ISO 9001 principles of quality management, they get enlightened when they do so, which will therefore sanitize the construction industry in Nigeria, thus increasing their reputation among the world's construction professionals.

### 3. Research Methodology

This study adopted a questionnaire survey design. The instruments for data collection for this study were a structured questionnaire and interview administered to project/quality managers in construction firms in Enugu State (which include Civil Engineer, Electrical Engineer, Builder, or any other professional involved in the construction industry). Enugu State was selected for its proximity and because of the numerous building construction firms in the state. The population of the study is sixty-five (65) building construction firms. There was no sampling as the population of the study was manageable. The researcher distributed the questionnaire to the respondents with the help of a research assistant who was briefed on how to administer the instrument. The data collected was analyzed using descriptive statistics aided by Statistical Package for Social Sciences (SPSS) and presented through percentiles, mean, and frequencies.

### 4. Results

This section addresses the presentation and interpretation of data obtained from the field survey. Table 1 gives a breakdown of the sampled respondents involved in this study. The

demographic characteristics of the respondents include their gender, qualifications, Professional Body affiliation, and years of experience.

Table 1: Demographic information of Respondents

	Frequency	Percentage (%)
<b>Gender</b>		
Female	4	7.55
Male	49	92.45
<b>TOTAL</b>	<b>53</b>	<b>100</b>
<b>Qualification</b>		
HND	8	15.09
B.Sc.	32	60.38
PGD	2	3.77
M.Sc.	7	13.21
Ph.D.	4	7.56
<b>TOTAL</b>	<b>53</b>	<b>100</b>
<b>Professional Body affiliation</b>		
NIOB	18	33.96
NIA	9	16.98
NSE	26	49.07
<b>Total</b>	<b>53</b>	<b>100</b>
<b>Year of Practice</b>		
0 – 5	11	20.75
6 – 10	25	47.17
10 and above	17	32.08
<b>Total</b>	<b>53</b>	<b>100</b>

Source: Field data 2023

Table 1 indicates that, out of the fifty-three (53) respondents whose questionnaires were retrieved, 49(92.45%) are male, and 4(7.55%) are female. This result indicates that project/Quality managers of building construction firms in the study area are dominated by male counterparts. This could indicate poor involvement of females in construction work even after they have studied courses related to the construction industry. The level of academic qualifications attained by the respondents and their professional affiliations shows that the respondents are academically and professionally qualified to provide reliable and useful information. Based on the 53(92.45%) questionnaires retrieved, it can be deduced that most of the respondents have good working experience. This indicates that the respondents are well experienced in the construction industry to provide significant information that can be relied upon for the study.

Table 2: Existence of Quality Management Policy in Construction Firms in Study Area

Response	Frequency	Percentage (%)
YES	39	73.58
NO	14	26.42
<b>Total</b>	<b>53</b>	<b>100</b>

Source: Field survey 2023

Table 3: T-Test Analysis results of Firm's Compliance with ISO 9001 standards

Quality Principle	Mean	T	df	P value	95% Confidence Interval of the Difference		
					Mean Difference	Lower	Upper
LEADERSHIP	3.48	-9.05	38	.000	-1.51648	-1.8557	-1.1772
FACT BASED DECISION MAKING	3.42	-11.1138	.000	-1.58120	-1.8695	-1.2929	
INVOLVEMENT OF PEOPLE	3.51	-11.7338	.000	-1.48718	-1.7439	-1.2305	
FOCUS ON CUSTOMERS	4.12	-7.78	38	.000	-.88141	-1.1108	-.6520
RELATIONSHIP MANAGEMENT	3.45	-8.75	38	.000	-1.54579	-1.9035	-1.1880
CONTINUAL IMPROVEMENT	3.39	-9.28	38	.000	-1.61172	-1.9634	-1.2600
PROCESS APPROACH	3.88	-7.59	38	.000	-1.12454	-1.4245	-.8246

The longer one stays in a job, the better understanding of the organization he/she has.

Existence of quality management policy in construction firms in the study area.

Table 3 presents the result of the T-test analysis of the level of compliance of the construction firm's quality policies with ISO 9001 standards. It is observed from the results that the p-value is less than 0.05 ( $p < 0.05$ ). The individual mean scores of the principles are not also equal to the test mean value. This indicates that the policies of construction firms do not completely comply with ISO 9001 standards. The policies of the construction firms comply to a great extent with the "Focus on Customers" principles, with a mean of 4.12 which is closer to the test mean value. The policy with the least level of compliance is the "Continual Improvement" principle with a mean value of 3.39. Therefore, it can be said that the quality management policies of construction firms in the study area do not completely comply with ISO standards.

Table 4: Extent of implementation of quality management policy by construction firms.

Response	Frequency	Percentage (%)
Very often	10	25.64
Often	19	48.72
Undecided	6	15.38
Rare	4	10.27
Very rare	0	0
Total	39	100

Table 4 shows the extent to which the construction firms in the study area implement their quality management policies in construction projects. It indicates that 10(25.64%) and 19(48.72%) of the respondents respectively implement quality management principles very often and often, while 4(10.27%) rarely apply these principles. This indicates that a good number of firms in the study area frequently implement their quality management policies in their building construction projects.

Table 5: Nature of building construction works to which Firms apply Quality Policy

Response	Frequency	Percentage (%)
All building	18	46.15
Building above one floor	21	53.85
High rise buildings	0	0
Total	39	100

In Table 5, in the frequency of the nature of building construction projects to which firms apply their Quality management Policies, results show that 18(46.15%) of the firms apply it in all their building construction projects, while 21(53.85%) do so on buildings above one floor. Summarily, these results indicate that building construction firms in the study area are fully aware of quality management policies and practices. However, it can be predicted that some of the firms are yet to adopt a better approach to quality management as they don't implement their quality policies in all their projects.

## 5. Conclusion

In conclusion, based on the findings from the study, it can be inferred that quality management policy exists in over 70% of building construction firms in the study area. Despite the existence of quality management policies in construction firms in the study area, their quality management policies do not completely comply with ISO standards as there are low perceptions of some of the principles of quality management as outlined by ISO 9001. "Focus on Customers" principle of quality management received the highest level of compliance while "Continual Improvement" principle received the lowest level of compliance. It is recommended that to sustain the level of compliance with ISO 9001 in a construction firm, the firm should further maintain a continuous improvement approach and update its quality management policies. Firms should also apply their quality policies in all building projects.

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