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AN ASSESSMENT OF QUALITY MANAGEMENT SYSTEM PRACTICES IN UNIVERSAL BASIC EDUCATION PROJECTS IN KADUNA STATE

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ABSTRACT

Due to the insufficient implementation of quality management methods by construction firms in developing nations, the adoption of Quality Management System (QMS) in building projects is reported to be lower in these countries than in developed ones. This study looked into the Quality Management System (QMS) procedures used in State Universal Basic Education Board (SUBEB) projects. It also evaluated the benefits of adopting a QMS, the factors influencing QMS implementation, and the causes of QMS faults in UBE projects in Kaduna state. On this topic, a survey was sent to the Kaduna State Universal Basic Education Board's senior management team. 49 surveys were distributed in total, all of which were correctly filled out, returned, and examined. To analyse the data, descriptive statistics were employed. The results showed that the main variables influencing the adoption of QMS in UBE projects in Kaduna state were the application of various quality ideas, lack of motivation, and the belief that quality is expensive, which were ranked 1st 2nd and 3rd respectively. The two most significant advantages of implementing a quality management system (QMS) were improved project performance and enhanced reputation for high-quality design and construction. As regard the most important benefits derived from the implementation of QMS, Increased project performance and Enhanced reputation for good design and construction were ranked high. While 'inappropriate method of contractor selection' was found to be the main source of QMS defects in UBE projects in Kaduna state. Based on these findings, it is pertinent to recommend that organisations such as SUBEB should ensure a mandatory QMS independent certification and construction professional bodies such as; NIOB/CORBON, NSE/COREN, NIQS/QSRBN, NIA/ARCON etc. should be mandated as independent third-party certification bodies in Nigeria to ensure strict compliance to codes and standards.

Keywords: GLUT-4 gene, insulin resistance, medicinal plants, Nigella sativa, type 2 diabetes

1.0 INTRODUCTION

On September 30, 1999, the Federal Government of Nigeria established the Universal Basic Education Commission (UBEC), an agency of government tasked with overseeing all facets of the Universal Basic Education (UBE) program's execution, as part of its policy push for basic education in the nation. The UBE programme was essentially launched as a reform initiative with the goal of improving the quality and expanding access to basic education across Nigeria (ube.gov.ng, 2022). According to the UBE annual report from 2005, contributions in the form of guaranteed credits from foreign agencies and from local and international donors, as well as 2% of the Federal Government of Nigeria's consolidated federal revenue funds, are the primary sources of funding for UBE projects, of which infrastructure is a crucial component. This programme gets international funding through the World Bank credit and it is designated "Second Nigeria Primary Education Project" (PEP II CR 3346 UNI) while the Universal Primary Education (UPE) programme of 1976 was designated the "First"

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(PEP 1-CR2191- UNI) according to document obtained from Universal Basic Education Commission (UBEC, 2004). The World Bank assisted in Implementation of the UBE programme, with a Nigerian federal component of twenty million dollars ($20million). Prominent in the plan and guideline for the implementation of the UBE programmes, are provision of infrastructural facilities, which include construction of blocks of classroom. The programme document indicates that classrooms construction are planned to be executed in three phases at the rate of seven billion naira (7biliion) per phase. Similarly, The Japan's International Cooperation Agency (JICA) proposed to assist the UBE programme in rehabilitating and furnishing of some primary schools in three pilot states of Kaduna, Niger and Plateau (Anigbogu and Adewuyi, 2007). In a bid to domesticate the policy of the federal government on UBE, Kaduna state establishes through an act of law in 2004 the State Universal Basic Education Board SUBEB (subeb.kdsg.gov.ng, 2022).

In order to justify the funds expended by government, local and international organisations on UBE programmes, the need for Quality Management System (QMS) which will ensure the success of construction projects is important. According toMane and Patil, (2015), the impact of quality management on organisation's reputation is very huge, which could affect such organisation's progress and vision.

It is clear that building construction makes a significant contribution to each country's economic growth, and quality management principles cannot be entirely disregarded in construction projects (Farooqui, Masood, and Aziz 2008). A nation's ability to grow is largely dependent on the calibre of its building projects and infrastructure (Wasiu, Aliu, and Modupe 2012). Regrettably, most construction businesses have downgraded QMS, which is the typical procedure for most construction projects (Abdulazeez, 2022).In Nigeria, infrastructure provision organisations such as the UBE board have major problems in the utilisation of total quality tools and techniques which usually results in contractors and clients engaging the services of quacks and the use of inferior construction materials in a bid to reduce costs, the resultant effect of which are accidents and/or deaths during and after the construction process (Kado, 2013). Nonetheless, several scholars have highlighted the issues surrounding the building industry's quality standards (Rumane 2017; Lee *et al.*, 2020). According to Abdulkareem and Adeoti, (2010), building sector in Nigeria is particularly concerned about the rising number of collapsed structures that have occurred recently throughout the nation. This shows that there is a great task in these organisations to ensure quality management of projects especially in the State Universal Basic Education Board (SUBEB).

In order to create and execute a general model of a QMS for the information technology sector, Ken Croucher, a British management consultant, came up with the phrase "quality management system" and its abbreviation "QMS" in 1991.According to Doyle (2005) The International Organization for Standardization (ISO) 9001 QMS is a collection of business processes dedicated on consistently meeting customer requirements and improving their satisfaction. It is associated with an organisation's determination and strategic direction.By using QMS programs, businesses can improve long-term operations, product and process quality, foster a positive team environment, increase employee job satisfaction, increase revenues, lower quality costs, improve customer service and competitiveness in the market, enhance professionalism and skill across the board in the construction industry, and assist in achieving the goals and benefits of proposed projects (Low and Teo, 2004).

Quality management (QM) has been an important issue for organisational growth and success (Belle 2000; Pheng & Teo 2004; Gowthami, Sridhar & Venkata 2020). However, the construction industry is faced with challenges arising from accomplishing

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quality and customer satisfaction (Gowthami, Sridhar & Venkata 2020). Another issue is on how organisations can meet the demands of the clients/users by delivering high quality projects at the lowest cost in a time of wide competition from various bidders. These and many other reasons which increase the problem of quality and results in businesses engaging in sharp practices in an effort to be more competitive, sometimes they also reduce bids by cutting profit margins in the hope of winning the few jobs available (Abdulazeez, 2022). Leonardo (2006) stated that that global competition in the market in developing competitive edge, profitability, increased productivity, creating goodwill and reputation and reduction in cost of rework, repairs etc., appeals for the adoption of QMS in all organisations which influence teaching and learning environment and consequently affects human development.

According to Adusa-Poku, (2014) adoption of Quality Management System QMS in construction projects of developing country is low compared to developed countries, as the construction firms in the developing countries are slow in adopting quality management practices. Ashokkumar (2014) also stated that India construction industry has been struggling with quality issues for many years and the construction firms have been wasting resources as a result of faulty constructions attributed to human factors like poor knowledge of quality control mechanisms and the legislations guiding them. Therefore, there is the need to assess the QMS required to satisfy the clients for attaining productivity and business performance in projects. In Nigeria, little is known about Quality Management System among Infrastructure provision organisations such as UBE (Omojola and Olugboyega, 2016). This explains the reason for assessing the Quality Management System QMS of Universal Basic Education UBE projects as the provision of infrastructure such as blocks of classroom together with other instructional facilities are of utmost necessity for the realisation of the objective and success of the programme. This paper seeks to answer the following questions; What are the most important factors affecting the implementation of QMS in SUBEB? What are the benefits of QMS in SUBEB? What are the possible sources of quality defects in SUBEB projects? The research sought the perception of top and middle management of SUBEB Kaduna state.

1.1 Concept of Quality Management System QMS

The quality management system, as defined by the International Organization for Standardization ISO 8402 (1994), is the organizational structure, process, resources, and procedure required to implement quality management. It comprises all of the activities of the overall management function that establish the quality policy, objectives, and responsibilities and carry them out through the use of quality planning, assurance, control, and improvement. Mane and Patil (2015) also used the terms quality assurance, quality control, and quality planning to describe the quality management system. Hoonakker et al. (2010) opined that the concept of quality management system involves, investing in people, attainment of International Organisation for Standardization ISO 9000 certification which includes two types of standards: those relating to Quality Assurance and those relating to Quality Management.The British Standards Institution specifies that ISO 9001, ISO 9002, and ISO 9003 are the quality control standards intended for procurement assessment purposes. Organizations creating and implementing quality systems are intended to follow the guidelines provided by the ISO 9004 quality management standard. An certified third party (an authorized external auditor) has been shown by a company registered as adhering to ISO standards that its processes have been recorded and that the business is routinely audited (Abdulazeez, 2022).

Building construction organizations must, in the words of Rumane (2011), show that they can continually deliver construction projects that either meet or surpass the expectations and satisfaction of their clients.

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They must also adopt the right procedures for the ongoing improvement of the QMS and related assurances of conformity to client-applicable regulatory requirements.

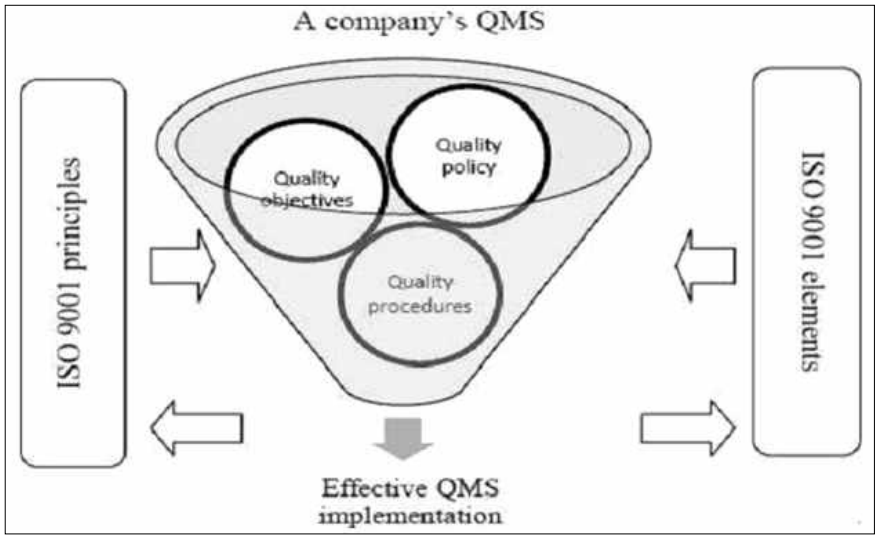


Figure 1: Typical effective Quality Management SystemQMS implementation (Rumane, 2011; Abdulazeez, 2022).

American Society of Civil Engineers ASCE (2005) emphasised that codes and ethics are essentialin protection of public health and safety likewise the environment and also to ensure that adherence to standards is maintained at the preliminary stage of the construction project.

If suitable norms and standards are not followed from the start of construction projects, significant expenditures and delays may result. Therefore, in order to ensure that construction projects are completed successfully, specialists must adhere strictly to norms and standards when carrying out any building project. According to Watson and Howarth (2011), ISO 9001 is still predicated on a compliance system that involves a thorough evaluation of the organization in comparison to a standard. The organization is then given the opportunity to become accredited if it passed all evaluation examinations. Ensuring that work is completed in accordance with the intended requirements during the design and development phase is the key to an effective QMS implementation (Figure 1). Furthermore, client must express satisfaction with the end products and services (Beaumont 2006).

1.2 Implementation of QMS in Construction Projects

Construction projects mostly required huge costs to reach completion. Likewise, time and resources are significant factors that decide the cost-effectiveness of any project. Failure during construction process often results in project delay or abandonment. Especially where total reconstruction of a structure is required, an increase in cost becomes unavoidable.In the worst instance, building failure could cause fatalities or serious injury to people (Sanni and Windapo, 2008). In-depth study on quality control is vital to prevent the enormous rise in capital expenses (induced by the need for reconstruction) or the potential for fatalities from accidents. For the construction process and delivery to be improved, these qualitative procedures are very crucial.However, Jimoh (2012) states that the risk of construction failure will be significantly reduced if professionals in the field (architects,

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builders, engineers, etc.) closely follow Standard quality management techniques. Unfortunately, most building procedures have not been conducted with strict adherence to quality management systems (QMS). In Nigeria's construction sector, a quality management system is essential to the completion of a project successfully. Professionals in industrialized nations' construction industries have tested and embraced QMS throughout the world, and it consistently optimizes total cost over the course of a project's life cycle (Abdulazeez, 2022).

According to Mane and Patil (2015) Quality Management System could be implemented at the organisational level or at the project level. Kado (2011) and Adenuga (2012) noted that the implementation of QMS in an organisation require organisational cultural change. However, changing an organisation's culture is a very difficult task, which is often faced with internal and external resistance. According to Hoonakker et al. (2010), the size of the organization has an impact on how well quality management is implemented. Top management commitment was shown to be the most significant element influencing quality management methods by Chin and Choi (2003).Arditi and Gunaydin (1997) also suggests that achieving quality in a building project is a difficult task involving the collective effort of all relevant stakeholders such as the client, architect, contractor, manufacturer and the end user. Additional factors impacting quality management practices at the organizational or project level include: unclear standard requirements interpretation; training policies; absence of internal quality audits and staff training at all levels; lack of awareness; absence of a quality management system; high implementation costs; and time constraints (Omojola and Olugboyega, 2016). The analysis of the studies showcased the factors affecting the implementation of QMS to include the following: Inadequate knowledge and information about QMS; Difficulty in measuring the effectiveness of QMS; Poor internal communication; Poor performance of quality tools and procedures; Poor relationship and partnering among project participants; Lack of management commitment; Insufficient training resources for employees and Belief that quality is expensive.

1.3 Benefits of Quality Management System (QMS)

According to Liu, (2003); Hoonakker *et al*., (2010); Pheng and Wee, (2001); McIntyre & Kirschenman, (2000); Kiwus and Williams, (2001); Turk, (2006); Watson & Howarth, (2011); Ofori *et al*., (2002) and Omojola&Olugboyega, (2016).The implementation of a Quality Management System can accelerate project completion and profitability, enhance client satisfaction, minimize project defects and rework, give the company a competitive edge, and help it finish projects on time and under budget. It can also boost a construction company's reputation, help it win repeat business from clients, improve schedule performance, strengthen ties with consulting architects and engineering firms, increase project buildability factors, promote control over suppliers and subcontractors, lower inspection costs, improve product quality, improve workmanship and efficiency, decrease waste, and enhance organizational communication.

In a similar vein, Adenuga (2012) claimed that formal quality assurance procedure deployment can result in the following advantages: Improved reputation for quality design and construction; better design and construction; fewer delays and disruptions; lower cost of remedial and repeat works; better planning; better site management; higher project performance; efficient management of construction problems; better quality in construction; and more.

Other advantages of Quality Management System (QMS) outlined are;

a) Improved communications and efficiency.

b) Supervising of work and avoidance of

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unnecessary and costly efforts, failures and expensive remedial work.

c) Documented proof that work has been executed in compliance with document and specifications.

d) Easier implementation of client changes.

e) Precise clarification and quantification of the effects of such changes.

f) Easier identification and quantification of delays and claims.

g) Completion on time.

h) Reduced maintenance period of remedial works.

I) Provision of as-built recordson completion of any project.

j) Possible reduction of insurance premiums.

k) Improved competitiveness and marketability of services.

2.0 METHODOLOGY

This study used a quantitative research design. Utilizing a standardized questionnaire, data was gathered.The target population includes the top and middle level staff of the physical and project Monitoring department of SUBEB who are responsible for the policies and implementation of QMS. The recommendation made by Fox, as reported by Adenuga (2012) and (Kado, 2011), that decisions regarding quality in building operation rest on the desks of top and middle management levels and that they are in the right position to have adequate knowledge for the study regarding QMS, guided the decision to use only top and middle management staff. The total number of the population is 80.Sample size was determined using the Kish formula for finite population found in Agbodjah (2008). A minimum sample size of 49 was obtained. 49 questionnaires were administered. Purposive Sampling technique was used based on the recommendation by Fellows and Liu (2003). Data was analysed using descriptive statistics.The questionnaire consists of sections A and B. Section A comprises the factors affecting the implementation of QMS in building projects of SUBEB. Respondents were requested to rank them on a 5-point Likert scale with "5" indicating "Very Relevant" and "1" indicating "Very Irrelevant". Section Bcomprises the benefits to be derived on successful implementation/adoption of QMS in building operations in the SUBEB. Respondents were requested to rank them on a 5-point Likert scale with "5" indicating "Very serious" and "1" indicating "Never serious".

3.0 RESULTS AND DISCUSSION

3.1 Factors affecting the implementation of QMS in SUBEB building projects

Assessment of the factors affecting the implementation of QMS in SUBEB building projects. Respondents were presented with 10 factors affecting the implementation of QMS in SUBEB building projects and were asked to rate the impact of the factors on the implementation of QMS in SUBEB building projects on a 5 point scale as described in the methodology.

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Table 1: Factors affecting the implementation of QMS in SUBEB Building Projects

S/N	Problems	Scale					Missing	∑f	∑fx	Mean	Rank
		1	2	3	4	5					
4	Application of various quality concepts	3	5	10	15	15	1	48	178	3.63	1st
8	Lack of motivation	4	6	7	19	12	1	48	173	3.53	2nd
10	Belief that Quality is expensive	2	6	11	14	14	2	47	173	3.53	2nd
5	Inadequate information/awareness	4	5	9	19	11	1	48	172	3.51	4th
6	Corruption in maintenance sub-sector	3	12	4	17	12	1	48	167	3.41	5th
3	Partial commitment	2	10	9	13	13	2	47	166	3.39	6th
2	Lack of top management support	6	7	8	14	13	1	48	165	3.37	7th
1	Ignorance of the concept	6	8	9	10	15	1	48	164	3.35	8th
7	Poor Organisational culture	6	6	11	12	13	1	48	164	**3.35**	8th
9	Lack of Experience	4	9	9	15	11	1	48	164	3.35	8th

Source: (Field survey, 2022)
(Scale: '1' = Very Irrelevant; '2' = Irrelevant; '3' = Fairly Relevant; '4' = Relevant; and '5'=Very Relevant)

Application of various quality concepts' ranked as first on the ranking scale of table 1. This is in agreement with the ISO 9000 (2000) which asserts that people at all levels are the heart of an organisation and their full involvement enables their abilities to be used for the organization's benefit. It has been observed that people are typically more productive when working in teams or groups to achieve shared objectives than when working alone. 'Lack of motivation' and 'Belief that quality is expensive' were both ranked second. These findings are in consistent with an earlier study by Omojola and Olugboyega, (2016) where the willingness to sacrifice quality for profits by management was ranked high in construction firms in Lagos.

3.2 Benefits to be derived from application of QMS tools in the Organisation

Respondents were presented with 20 benefits derived from application of QMS tools in SUBEB and were asked to assess these benefits on a 5 point scale as described in the methodology.

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Table 2: Ranking of the benefits derived from the application of QMS tools in the Organisation

S/N	Problems	Frequency of Response									
		1	2	3	4	5		∑f	∑fx	Mean	Rank
1	More effective planning	2	3	4	19	20	1	48	196	4.08	1st
8	Enhanced reputation for good design and construction	2	2	3	23	16	3	46	187	4.07	2nd
7	Provision of feedback for future project	5	0	2	21	20	1	48	195	4.06	3rd
4	Improved quality	1	3	7	20	17	1	48	193	4.02	4th
3	Efficient management of construction problems	3	3	6	16	20	1	48	191	3.98	5th
9	Checking of work and avoidance of unnecessary and costly efforts, failures and expensive remedial work.	3	1	6	23	16	0	49	195	3.98	5th
2	Increased project performance	2	5	7	14	20	1	48	189	3.94	7th
5	Lower cost of remedial and repeat works	1	4	10	16	17	1	48	188	3.92	8th
10	Documented proof that work has been executed in Compliance with document and specifications.	3	2	6	25	13	0	49	190	3.88	9th
6	Fewer delays and disruptions	2	2	9	24	12	0	49	189	3.86	10th

Source: (Field survey, 2022)
(Scale: '1' = Very Irrelevant; '2' = Irrelevant; '3' = Fairly Relevant; '4' = Relevant; and '5'=Very Relevant)

Table 2 shows the ranking of the benefits derived from application of QMS tools in the organisation. 'More effective planning' with "MIS= 4.08is ranked 1st and very relevant among the benefits from the application of QMS in the organisation. Organisations must compete either in order to survive, increase profit or increase market share and globalisation has made project performance a yardstick. Enhanced reputation for good design and construction' has (MIS=4.07) with 2nd position on the rank. 'Provision of feedback for future project', with MIS=4.02 is ranked 3rd. The SUBEB, an organisation purchasing various designs concept is likely to be more relevant to better design on full implementation of QMS. "Fewer delays and disruptions"with MIS=3.86 is the least benefits to be gained from the implementation of QMS in SUBEB.

3.3 Sources of Quality defects (SQD) in SUBEB building Project.

20 sources of quality defects in SUBEB building projects were identified. Respondents were asked to assess the relevance of the SQDs on a 5 point scale (1= Very Irrelevant; 2= Irrelevant; 3= Fairly Relevant; 4= Relevant; and 5=Very Relevant)

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Table 2: Sources of Quality Defects (SQD) in SUBEB building projects

S/N	Problems	Frequency of Response									
		1	2	3	4	5		∑f	∑fx	Mean	Rank
4	Inappropriate method of contractor selection	4	2	6	16	20	1	48	190	3.96	1st
9	Lack of process improvement	3	5	7	16	17	1	48	183	3.81	2nd
20	Project Environment	2	9	8	12	16	2	47	172	3.66	3rd
1	Lack of contractor supervision	7	3	6	16	16	1	48	175	3.65	4th
2	Poor relationship and partnering among project participants	3	6	7	21	11	1	48	175	3.65	4th
5	poor quality procedure and department	5	3	9	17	12	3	46	166	3.61	6th
18	Project size and complexity	6	3	9	18	12	1	48	171	3.56	7th
3	Reduced Subcontractor responsibility	3	9	9	16	11	1	48	167	3.48	8th
7	Poor Training system	6	7	5	15	14	2	47	165	3.51	8th
17	Nature uniqueness	5	3	13	19	8	1	48	166	3.46	10th

Source: (Field survey, 2022)
Scale: '1' = Very Irrelevant; '2' = Irrelevant; '3' = Fairly Relevant; '4' = Relevant; and '5'=Very Relevant)

The **Table 3** shows that "inappropriate method of contractor selection" is the 1st in the ranking scale on a 5 point Likert scale, with MIS of (3.96) which means that poor procurement method is the most relevant source of quality defect. 'Lack of process improvement' is ranked 2nd with an MIS of (3.81) which implies that there is need for management commitment in implementation of changes in the organisational processes. This is part of the decisions of the organisation which is in consonance with the observations of Kado (2013) and Adenuga (2012) who showcased the factor as obstacle to implementation of QMS. 'Nature uniqueness' with MIS=3.46 is ranked least severe source of Quality defects as 10th on the ranking scale. From the above, majority of building failures and problems are believed to arise from errors due to either poor contractor selection or lack of process improvement. These problems are classified on Stakeholder or Managerial, technical, material/ Environment /Equipment and cultural/political (Adenuga, 2012).

4.0 CONCLUSION

In conclusion, the following conclusions can be inferred from the survey's results.

1. The study observed that the most severe factors affecting the implementation of QMS in UBE projects in Kaduna are; application of various quality concepts, followed by the 'Lack of motivation' and the belief that quality is expensive, while the least severe factors are; poor internal communication' and 'internal threat.
2. In terms of the most important benefit of implementing QMS in state UBE projects; more effective planning and provision of feedback for future project were ranked highest, while the least important benefit is better design.
3. It was conculded that the most relevant source of quality defect in UBE projects is from 'inappropriate method of contractor selection.

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4.1 RECOMMENDATION

Based on the findings, it is pertinent to recommend that organisations such as SUBEB should ensure a mandatory QMS independent certification and construction professional bodies such as; NIOB/CORBON, NSE/COREN, NIQS/QSRBN, NIA/ARCON etc. should be mandated as independent third-party certification bodies in Nigeria to ensurestrict compliance to codes and standards.

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