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QUANTITY SURVEYORS SCORECARD IN THE 4IR: UNRAVELLING THE BIM RESPONSIVENESS IN DEVELOPING COUNTRIES

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Abstract

BIM has become the new international benchmark for the efficiency of design, construction, and maintenance of buildings. It is the platform that brings about the collaboration between project stakeholders and the improvement of project outcomes. The aim of this study is to investigate the BIM awareness level of Nigerian Quantity surveyors. A field survey was conducted using a structured questionnaire, self-administered to quantity surveyors. The survey revealed that professionals are moderately aware but far from implementation. Professional bodies should organize rigorous awareness campaigns (workshops, seminars, training, etc.). This will prepare Nigerian Quantity surveyors for a technological revolution in the construction industry.
Keywords: BIM, BIM awareness, BIM knowledge, BIM implementation, Quantity surveyor

Introduction

Building information modeling (BIM) has become a front-burner issue for discussion in the construction industry. The industry has been discussing and also making series of adjustments to accommodate the disruption associated with the BIM innovation. This adjustment has affected and will continue to affect the process in the construction industry. BIM is poised to introduce effectiveness and efficiency to the construction process. However, the construction process cannot be properly managed and coordinated without the professionals and other stakeholders in the industry. BIM provides a platform for collaboration for efficiency during the construction process.

Awareness can be said to be a measure of the knowledge or perception of a thing or fact. BIM is not a new concept and has existed for a long time. Over the years, it has increased in popularity and usefulness. Its relevance is very much felt and acknowledged in the construction industry (Newton and Chileshe, 2012). In Nigeria, there has been a dearth of studies carried out in order to discern the level of awareness of BIM among quantity surveyors especially(Abubakar *et al.*, 2014; Adekunle *et al.*, 2020, 2021; Fadason *et al.*, 2018; Kori and Kiviniemi, 2015) focused on the industry. Studies have shown that the construction industry is always reluctant when it comes to adopting of new

technology (Yang, 2007); compared to other industries, the construction industry is more reserved in the application of new technologies. Gambatese and Hallowell, (2011) studied the differences in the rate of technical innovation throughout the construction industry.

Meanwhile, the model for IT implementation process postulated that there exist six stages for the implementation of new technology. These are namely initiation, organizational adoption, adaptation, acceptance and adoption, routinisation, and infusion (Korpelainen, 2011). For most firms and professionals, the initiation (awareness) stage is where they presently belong. Going beyond this stage remains a heinous task for them. It can be inferred that one cannot adopt what he possess limited knowledge of. Only a few possess this knowledge in the industry presently and a collaborative effort by all stakeholders is established as the only solution to this problem (Kori and Kiviniemi, 2015). This study, therefore, tests the knowledge of the Quantity surveying professionals majorly in the Nigerian Construction Industry.

Research method

This study considered the BIM knowledge among Quantity surveyors in the Nigerian construction industry. Survey design was adopted, and well-structured questionnaires were designed to gather responses from consultant quantity surveyors in the Lagos State area of Nigeria. Lagos state was chosen because it has a high number and concentration of consulting quantity surveying firms. The result is expected to representative because seventy-five percent (75%) of quantity surveying firms in Nigeria are either based in Lagos or have branches in the state (Oke *et al.*, 2010). Meanwhile, Naoum, (2016) opined that questionnaires are the most suitable technique for a survey research.

A total of seventy-three (73) copies of questionnaire were distributed, only fifty-two (52) copies deemed fit for analysis were retrieved from the field representing 71.23% as shown in table 1 below. The 71% response rate is considered adequate for the study as a response rate of 20 to 30% is established to be adequate for survey researches(see (Oke *et al.*, 2018). Level awareness of BIM amongst Nigerian quantity surveying professionals was measured using an eleven (11) item construct measured on a Likert- type scale on a five-point levels of agreement (Strongly disagree to Strongly agree).

Table 1: Responses to Questionnaires

S/N	Questionnaire	Number	Percentage
1.	Administered	73	100
2.	Received	52	71.23

Background Information

Table 2: Background information of the respondent

Characteristics	Sub-Characteristics	Frequency	Percentage
Designation	Principal/ Partner	2	3.8
	Associate Partner	4	7.7
	Senior Q.S.	28	53.8
	Junior Q.S.	11	21.2
	Trainee Q.S.	7	13.5
Academic Qualification	HND	8	15.4
	B.Sc. /B.Tech.	30	57.7
	M.Sc.	11	21.2
	Others	13	5.7
Professional Qualification	MNIQS	30	57.7
	FNIQS	2	3.8
	MRICS	3	5.8
	FRICS	1	1.9
	Others	5	9.6
	Missing system	11	21.2
Post-graduation industry work experience	0-10 years	36	69.2
	11-20 years	14	26.9
	21-30 years	1	1.9
	Above 30 years	1	1.9

Table 2 above shows that only two (2) which represent 3.8% of the respondents were principal managing partners, 7.7% which represent four (4) respondents were associate partners. 53.8 % which represent twenty-eight (28) respondents were senior quantity surveyors; 21.2% which represent eleven (11) respondents were junior quantity surveyors while the remaining 13.5% representing seven (7) respondents were trainee quantity surveyors. Eight (8) respondents which represent 15.4% of the sample have HND; thirty (30) respondents which represent 57.7% of the sample have B.sc/B.Tech; eleven (11) respondents which represent 21.2% of the sample have M.sc; three (3) respondents which represent 5.7% of the sample have other educational qualification. The qualifications categorized as others were; one (1) OND, one (1) PGD and one (1) M.P.M. It can be deduced that majority of the respondents of this questionnaire are B.sc certificate holder with 57.7%. Out of the fifty-two (52) respondents, only forty-one (41) of them which represent 78.8% are either professionally qualified or attached to professional bodies. Out of the forty-one (41), thirty (30) which represent 57.7% were MNIQS, two (2) respondents which represents 3.8% were FNIQS one (1) respondent which represents 1.9% was MRICS while the remaining five (5) respondents (9.6%) fell under the category of others. This implies that a larger percentage of the respondents (78.8%) are professionally qualified quantity surveyors. 69.2%; thirty-six (36) respondents have

post-graduation working experience of less than or equal to 10 years, 26.9% which represent fourteen (14) respondents have post-graduation working experience between 11 – 20 years while 1.9% which represent one (1) respondent has working experience between 21 – 30 years. 1 respondent (1.9%) has working experience of above 30 years. This shows that bulk of the respondents are new in the industry, as such are supposed to embrace technological innovation that will aid the delivery of the services of quantity surveyors.

Analysis of Data

BIM knowledge amongst Nigerian Quantity Surveyors

Respondents were requested to indicate their level of agreement with the statements on BIM knowledge among Nigerian quantity surveyors with eleven (11) constructs by ticking from: strongly disagree (assigned 1), disagree (assigned 2), neutral (assigned 3), agree (assigned 4) and strongly agree (assigned 5). The result, presented in table 3 below, was analyzed using the mean item score. From the result, it is evident that the awareness of BIM among Nigerian quantity surveyors is fairly okay. The top ranked on the list is "I am aware of some BIM software packages" with mean value of 3.73. Seven of the eleven ranked factors have mean of above 3.00 with the remaining four factors ranking below 3.0. This means that the knowledge of the available BIM software packages among the respondents is the highest ranked variable while "I am currently using BIM on my projects" is the lowest which indicates the lack of adoption among the professionals.

Table 3: Awareness of BIM among Nigerian Quantity Surveyors

STATEMENT	MIS	Rank
I am aware of some BIM software packages	3.73	1
I am fully aware of BIM for some years' now	3.63	2
I got to know about BIM through personal reading	3.52	3
BIM also involves some hardware facilities	3.35	4
I know about the levels to which BIM operates	3.33	5
I became aware of BIM through my professional body	3.15	6
I know about standards/publications for BIM required for interoperability	3.02	7
I have attended seminars/workshop on BIM	2.92	8
My firm has worked with design consultants that used BIM	2.90	9
I am just coming to terms with BIM	2.63	10
I am currently using BIM on my projects	2.58	11

Discussion of Findings

The results presented in table 3 above contradicts the findings of Abubakar *et al.*, (2014) which revealed that lack of awareness of BIM technologies among professionals and lack of well-informed and experienced partners were the leading process barriers to BIM technologies adoption in the Nigerian construction industry.

These outcomes shows that the low implementation of BIM in the Nigerian construction industry is not due to awareness as construction professionals, especially quantity surveyors, are becoming more aware of the capabilities of the package. Therefore, the slow pace of adoption of BIM could be traced to other reasons such as cost of implementation (Eadie *et al.*, 2013) incompatibility with industry's Standard Methods of Measurement (Stanley and Thurnell, 2014) among other reasons. Result also shows the deficiency in the educational system; BIM is yet to be integrated into the curriculum. Most awareness has been gotten through personal efforts of respondents.

Conclusion

This study considered the BIM knowledge among Quantity surveyors in the Nigerian construction industry. Survey design was adopted, and well-structured questionnaires were designed to gather responses from consultant quantity surveyors in the Lagos State area of Nigeria. Based on the results, BIM awareness exists through personal efforts of quantity surveyors. The school and professional bodies are not making efforts to make their members aware of BIM. It is however unexpected that BIM has not been used by any of the respondents on their project; this is because the awareness level is encouraging. This also establishes the fact that BIM awareness does not translate automatically to adoption. Thus, awareness cannot be said to the cause of non-adoption of BIM but other cause that ranges from government regulation like the UK model, cost, clients' request, and failure of professionals to collaborate among others. This is a good area for further study.

The study therefore recommends that the educational system of the Nigerian tertiary institutions should incorporate BIM in the curriculum. This will enable the early exposure of students to BIM. Also, the professional body should organize workshop and seminars for members and incorporate it into their CPD. It is evident that other professionals too are not putting forward BIM on projects, clients are therefore enjoined to request for BIM adoption on their projects; this is to enable them get value for their investment.

It is strongly believed that the findings of this study will help the quantity surveyors, the professional body, and clients on ascertaining the problems with BIM adoption among the quantity surveyors.

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