



BUILDING INFORMATION MODELLING AND RENOVATION PROJECTS IN KADUNA, NIGERIA

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A b s t r a c t

New construction features the most in studies on the advancement in digital technologies in contrast to existing buildings. The application of BIM for renovation projects is underdeveloped both in practice and in studies. This study assesses the level of awareness of Building Information Modeling (BIM) for renovation projects among building contracting firms in Kaduna, Nigeria to promote sustainable construction. A survey questionnaire focused on 33 contracting firms in Kaduna metropolis using purposive sampling. With a return rate of 75.8%, the level of BIM awareness was fair at 44%. Construction planning and constructability analysis were the dominant BIM application areas for renovation. Others include clash detection, quantity take-off and cost estimation. The main drivers include the availability of BIM software and clients' interest in the use of BIM. Main barriers are unclear liabilities among parties, training costs and lack of BIM expertise. Although the study found evidence of BIM use for renovation projects within the study area, it, therefore, recommends upskilling of personnel through BIM proficiency courses supported by relevant professional bodies. Future research could examine ways to increase clients' awareness of BIM for renovation projects to promote sustainable construction.

R e s e a r c h H i g h l i g h t s

1. Strong evidence of BIM use for renovation projects by contractors.
2. Construction planning and constructability analysis dominate BIM application areas for renovation.
3. Increased clients' awareness encourages more BIM use among contractors.

R e s e a r c h O b j e c t i v e s

This study assessed the level of awareness of Building Information Modeling (BIM) for renovation projects among building contracting firms in Kaduna, Nigeria with a view to promote sustainable construction. The Nigeria construction industry has been bedevilled with poor service delivery (1), poor productivity (2) and slow to respond to innovative practices and tools including BIM. Although the industry is taking initiatives for sustainable construction, adopting BIM could facilitate a high-efficiency industry (3). Furthermore, studies on BIM in Nigeria mostly feature new buildings than existing building. As such, this study keys into this premise to investigate BIM use on renovation projects in Kaduna Metropolis focusing on contractors.





Methodology

A survey questionnaire was administered to contracting firms in Kaduna metropolis, Nigeria. Out of a sample size of 182 firms from the records of the Federal Inland Revenue Service (FIRS), 33 firms were sampled using purposive sampling. The Statistical Package for Social Sciences (SPSS) was used to analyse the data for descriptive analysis. A return rate of 75.8% was achieved.

Results

The level of BIM awareness stood at 44% however, there was strong evidence of BIM use for renovation at 64%. Construction planning and constructability analysis were the dominant BIM application areas for renovation. This was followed by clash detection, and thirdly, quantity take-off and cost estimation. The main drivers were the availability of BIM software and clients' interest. Main barriers were legal and contractual issues, training costs and lack of BIM expertise. BIM capability was occasionally considered for subcontractor selection where electrical subcontractors ranked highest in utilising BIM for renovation projects among other subcontractors.

Findings

Results show that up to 56% of the firms that adopted BIM for renovation projects fall between 0-5 years. This suggest that young firms are more disposed to using innovative tools and processes for efficient service delivery. The main drivers and barriers found in this study are consistent with findings of (4–6). Also, the findings suggest ontractors can now compete with consultants on BIM utilization in Nigeria construcion industry ultimately promoting improved collaboration in the industry

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Author's Biography



Muhammad Zia-ul-haq Muhammad is Lecturer in the Department of Building, Ahmadu Bello University (ABU) Zaria, Nigeria since 2009. He earned his Bachelors degree in Architecture from ABU in 2004, MSc in Structural Engineering & Construction Management from Newcastle University, UK in 2007, MSc in Architecture from ABU in 2013 and is currently on his PhD programme in Quantity Surveying at Universiti Teknologi Malaysia (UTM), Malaysia since 2017. His research interests include Building Information Modelling (BIM), Construction Project Management and Information Technology in Construction