

A Survey on the Current Status of Building Information Modelling (BIM) Adoption in Quantity Surveying Practice in Kenya

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ABSTRACT

Building Information Modelling (BIM) offers the capability to automate building quantity take-offs directly from a digital information model. This can save the time spent by the QS manually measuring and counting items to focus on more valuable cost advice for the success of the projects. However, cost management and cost control remain the most significant challenges facing construction businesses worldwide. This paper aimed to establish the current status of BIM adoption in the Quantity Surveying Practice in Kenya. A mixed-methods research design was used, where quantitative results from the survey questionnaire were validated using qualitative results from the interviews. 167 responses were received out of 270 targeted respondents, and 5 interviews. The results indicated a below-average adoption rate, with a mix of computer-aided onscreen measurement and traditional paper-based practices prevalent. BIM use is less planned and more of a by-chance implementation. Institutions of higher learning should incorporate BIM in their quantity surveying curricula, and professional bodies in their seminars to build awareness on the benefits of its use for the QS profession.

Keywords: Building Information Modelling, BIM, Model-based cost estimating, Quantity Surveying Practice, Kenya

INTRODUCTION

The construction industry in Kenya is a vital component of the national economy, contributing to capital formation, employment creation, and the Gross Domestic Product (GDP). In 2024, it contributed a significant 6.3 per cent of the national GDP, according to the 2024 Economic Survey Report by the Kenya National Bureau of Statistics (KNBS, 2025). Quantity surveyors are in charge of the cost management of construction and infrastructure projects. Their work starts with quantity take-off, breaking the project into components synonymous with the project cost breakdown structure, preparing bills of quantities, pricing, and tendering.

Nevertheless, construction projects are becoming increasingly complex, with modern clients being more knowledgeable and demanding highly customized non-traditional services from quantity surveyors in terms of cost advice, financial planning and control, contractual management, and dispute resolution, among other roles (Shayan *et al.*, 2019). For quantity surveyors to excel in the provision of these services, their work must be based on very accurate estimations and quantifications of the proposed project. The traditional paper-based process of quantity take-off, squaring, abstracting, and developing draft bills is time-consuming, prone to error due to human judgment, and expensive from a business development perspective (Babatunde *et al.*, 2019).

Given the advances in information and communication technologies, these manual repetitive tasks can be automated with Building Information Modelling. By definition, Building Information Modelling (BIM) is a collaborative approach to project delivery that integrates project participants in a single shared project database, where key information required for making decisions about the facility being built is found and continually updated. This methodology is enabled by technology through BIM-supporting software. It is based on the work processes of the people involved in the project, with a recognition of the industry procedures and government regulations that govern the construction industry (Azhar, 2011; Wu et.al, 2014; Karasu, 2022).

It encourages project participants to be aware of the decision-supporting information requirements of others and to produce and share the right information, at the right time, in the right file formats, and with the right details to help them make decisions faster and execute the project efficiently (Autodesk University & Allen, 2016). The underpinning technology and associated software are just enablers due to their automation capabilities.

Therefore, this paper aimed to establish the current status of the adoption of Building Information Modelling (BIM) by quantity surveyors in Keya, by investigating the practices that are popular in the projects they handle, the documents they produce to support its implementation, and how they communicate their information needs to the other project team members (especially the model authors, because they depend on this information to do their cost management work).

BIM usage by the quantity surveyors is dependent on the quality of model information produced by model authors. The 3D model contains intelligent BIM objects, building components, and elements that build up the information model representing architectural, structural, MEP, and civil infrastructure of the designed facility. Using this, model-based design coordination and clash detection can be done to help the QS and the whole project team reduce and eliminate field conflicts. This reduces the number of requests for information produced, subsequently increasing the productivity on site, therefore serving as a cost control and quality assurance tool for the QS (AIQS & NZIQS, 2018).

As costs are linked to time, 4D BIM aspects are vital for the QS to visualize the whole construction process and simulate how the timing of site tasks affects the construction workflows, including resolving time-based clashes and verifying the sequence of works visually (AIQS & NZIQS, 2018). The 3D model linked to tasks in the simulated construction schedule then helps support model-based estimating and quantity take-off through 5D BIM. This is where quantity take-offs are generated from the model and linked to a cost database to compute the estimate. According to Wu *et.al* (2014), Babatunde *et.al.* (2019), and Ullah *et.al* (2019) this process provides more accurate cost information to the owner during the early decision-making phases of the design and throughout the lifecycle, considerably reducing the time taken to perform quantity take-offs, and making it easier to explore different design options and concepts with owner's budget, while quickly determining the costs of specific objects.

Further, the ability to do this is dependent on the capabilities of the firms to deliver various aspects and requirements of BIM in construction projects. These capabilities are technically referred to as the organization's BIM maturity levels, and include the following, as summarised by Kontothanasis *et.al* (2020) from the BewRichards BIM Maturity model:

1. Level 0: CAD (low collaboration) – the project promotes zero collaboration and makes use of paperbased 2D CAD drafting techniques to generate product information in the form of paper or electronic prints.
2. Level 1: 2D/3D (partial collaboration) – introduces the 2D drafting (generation of statutory approval documentation and product information) and 3D CAD (for conceptual work). Data exchange happens electronically.
3. Level 2: 4D/5D (full collaboration) - promotes collaborative working by giving each of the stake-

holders their own 3D CAD model, and the information is exchanged through a common data environment.

4. Level 3: 6D (full integration) – it promises deeper collaboration, enables the participants to work on the same model simultaneously, which eliminates the chances of conflicting information.

Full collaboration and integration require project information to be hosted on a Common Data Environment (CDE), which serves as a central repository that houses all the information pertaining to the project. Information inputs to this central project information repository are agreed upon by the parties of the project at specific points in the project cycle from the outset. The software solution then can be used to control access to this project information via folder-level permissions, tracking and managing upload, read, write and view activities, and provide a quality assurance process which can track and control the flow of information as agreed at the employer's information requirements (EIR) and BIM Execution Plan (BEP) and Model Content Plans (MCP) (AIQS & NZIQS, 2018). The EIR, BEP, and MCP are important for defining what information will be produced, how it will be packed, and how it will be shared with other project team members and transmitted to the next phase of the development of the project, throughout the project's lifecycle.

Researchers agree that BIM leads to better cost estimates and cost control in a construction project (Wu *et.al*, 2014; Babatunde *et.al.*, 2019; and Chan *et.al*, 2019). Combined with visualization to support the quantity surveyors in better understanding the design, BIM also supports the extraction of building quantities from the 3D digital building model, significantly reducing the time required to perform quantity take-off and prepare cost estimates. Also, as the quantity extraction reduces the over-reliance on human effort that would have been in manual quantity take-offs, this reduces human error and improves the accuracy of the quantity take-offs and cost estimates for better construction cost management at all phases of the project.

Further, 4D phase planning and simulation help in better construction planning and monitoring by painting a clear picture of how work items in a construction project will be sequenced, and operational challenges the contractor may face on site, and how to overcome them before the actual work begins on site. Also, by facilitating the ease of assessment of construction materials, construction plant, equipment, and work processes, BIM helps improve the quality of the construction project (Chan *et.al*, 2019). Stakeholders who see these benefits in other projects and value them are driven to start implementing BIM in their projects. Therefore, these advantages of BIM are the factors that drive its adoption and implementation in construction practices.

Also, Chan *et.al* (2019) in their study of BIM implementation in Hong Kong found that it speeds up the design process, improves the efficiency of project communication, and enhances the organizational image of the firms. Project information created at the design stage of the project can be passed over to the construction and other subsequent stages. At the construction stage, contractors will add construction data into the model, incorporating any changes that may be introduced to form the as-built model. This can then be passed to the facility management stage to help maintenance managers efficiently manage the project during its occupation stage, thus benefiting from the advantage of BIM to support lifecycle data sharing. In the construction stage, BIM can also be used to simulate safety operations in a virtual environment and integrate safety factors in the sequencing and scheduling of a project to avoid accidents (Nyabioge *et.al*, 2023).

Musyimi (2016) cites drivers of BIM adoption as the benefits of improved productivity, better project performance, and reduced wastage compared to traditional construction project management. These benefits are brought about by the integrated project delivery approach, which encourages the early involvement of all stakeholders in the construction project to harness their professional expertise and experiences for the success of the project.

However, despite these immense benefits that encourage its use, BIM has not achieved widespread adoption globally. There exist challenges like the high cost of BIM implementation in a construction project. This is attributable to high initial costs of buying BIM software licenses and subscriptions, and the cost of buying new

hardware tools or upgrading the existing ones to match the computing requirements of these software (Musyimi, 2016; Chan et.al, 2019). Even with the software, there are still incompatibilities in the way project data is packaged and digitally presented, which pose serious interoperability issues, making cross-platform collaboration difficult.

Further, BIM adoption is limited by a lack of educational and training programmes to facilitate the transfer of knowledge on BIM, a lack of professionals, contractors, and subcontractors with BIM skills, poor collaboration amongst project stakeholders with a low level of information sharing and coordination in the industry, and difficulties in measuring the benefits of BIM from an economic perspective. Also, some organizations have organizational structures that do not support collaboration which is at the heart of BIM, with parties that hold tight to their existing workflows and systems and resist any change that may come with BIM, including the lack of BIM demand by clients which means they don't pay for its use, and limited policies, standards and guidelines on the implementation of BIM (Musyimi, 2016; Chan *et.al*, 2019; and Mosse *et.al*, 2020).

Although these concerns affect quantity surveyors too because they work in collaboration with other project team members, there are specific barriers to BIM adoption in quantity surveying work that differ from the overall concerns of all stakeholders in the construction industry. Wu *et.al* (2014) identified three key limiting factors in the adoption of 5D BIM. To begin with, there is an inconsistent level of design information in the BIM models produced by model authors (architects, engineers, interior designers, etc), which is inadequate to support the automated extraction of building quantity data from the models. Then, data exchange issues between cost estimating software and model authoring software persist, making it hard to seamlessly link BIM models to external cost estimating databases for the production of reliable cost estimates. These, coupled with the challenge that the outputs from the BIM models are not standardized for direct pricing without further customizations or manipulations, make quantity surveyors prefer to maintain their existing cost estimating workflows that pair onscreen take-off software with spreadsheets for the preparation of cost reports and bills of quantities.

In Kenya, BIM adoption has been studied generally in the construction industry (Nasila & Cloete, 2018), its uses and influences in engineering contract management (Mosse *et.al*, 2020), structural design and analysis (Mwero & Bukachi, 2019), usage in construction project management (Musyimi, 2016), usage by contractors (Oyuga *et.al*, 2023), and its applications in construction safety and accident mitigation (Nyabioge *et.al*, 2023). This research studies its specific use by the quantity surveying profession, especially to perform model-based cost estimating.

Overall, the study was guided by a combination of the Task-Technology Fit (TTF) Theory and the Technology Acceptance Model (TAM). TAM proposes that an individual's perception of the ease of use and usefulness of a technology influences their attitudes towards technology use and subsequently drives its actual usage (Davis, 1986), although there are external social, cultural, and political factors that may have an impact on this. The TTF is based on the argument that the utilisation of technology can be predicted by examining how well the capabilities of the technology match the requirements of the task, which is the ability of a technology to support the task (Goodhue & Thompson, 1995; Marikyan & Papagiannidis, 2023). By combining TTF and TAM, Dishaw and Strong (1999) improved the explanatory strength of the model, with the individual's perceptions of ease of use and usefulness of a technology influenced by the fit (or match) between the technology capabilities and the task characteristics. BIM adoption by quantity surveyors can be explained by this model, as technology is a key enabler of the process and workflows, which require BIM software capabilities to support model-based cost estimating tasks. Additionally, since clients and consultants are in a principal-agent relationship, specific actions by the consultants and clients can be explained by this relationship, further strengthening the TTF-TAM combined model.

METHODOLOGY

The research adopted a pragmatic approach, which holds that knowledge can be generated by combining

objective expertise with an in-depth investigation of phenomena. As a result, mixed methods were employed, combining qualitative and quantitative research techniques, methods, and concepts into a single study (Wambugu et.al., 2015).

Further, a mixed-methods research design was adopted. This involved collecting and analyzing both qualitative and quantitative data independently, and then interpreting the results based on the two. The qualitative data were mainly used to validate the quantitative results by providing detailed in-depth explanations, reasoning, and argument (Mugenda & Mugenda, 2019).

There were 270 survey respondents selected from a population of 833 registered quantity surveyors in the Nairobi Metropolitan Area, Kenya. This area accounted for 1,238,405 million Kenya Shillings as the value of construction output in 2023 alone, according to the 2024 Statistical Abstract by the Kenya National Bureau of Statistics, which is 58.98% of the total value of the country's construction output that year. This sample size was arrived at using Taro Yamane's formula (as cited in Asenahabi and Ikoha, 2023), as follows:

N

$$n = \frac{1}{1 + N(e)^2}$$

Where:

n = sample size N = population size e = level of precision with a value of

0.05, at a 95% confidence level.

After employing the formula, the sample size will be as follows:

$$n = \frac{833}{1 + 833(0.05)^2}$$

$n = 270.23$

Therefore, the sample consisted of 270 respondents. The individual respondents for the survey were selected through a systematic random sampling procedure, while the respondents for the interview were selected using a purposive non-probability sampling technique. These interviews were conducted according to an interview guide developed to allow respondents to share their opinions, attitudes, and experiences about the adoption of 5D BIM in quantity surveying practice in Kenya, the benefits, challenges, and barriers encountered.

The research questionnaire underwent pilot testing first. It was hosted on Google Forms and sent out to the respondents through email to share their responses without having to visit in person. The interviews were done over Google Meet. The researcher recorded the audio conversation using the OBS Studio App for transcription, and later referenced it during the data analysis and interpretation of study results.

RESULTS AND DISCUSSION

The researcher received 167 responses out of 270 targeted respondents. This translated to a response rate of 61.9%. Additionally, five expert interviews were conducted. This was aimed at collecting qualitative data to corroborate the quantitative findings obtained from the survey. As the focus was on in-depth discussions and understanding of the research area, the interviews did not aim for representativeness, but for the depth and quality of the information shared.

The majority of the respondents (84%) indicated that the job title that best describes them is "Registered Quantity Surveyor", with others (16%) distributed amongst professionals who hold multiple titles, such as "Project Manager/Construction Project Manager" (3%), and "Assistant Quantity Surveyor" (13%). It is

common to see registered quantity surveyors in their early career stages still working as assistants reporting to a senior professional in the industry.

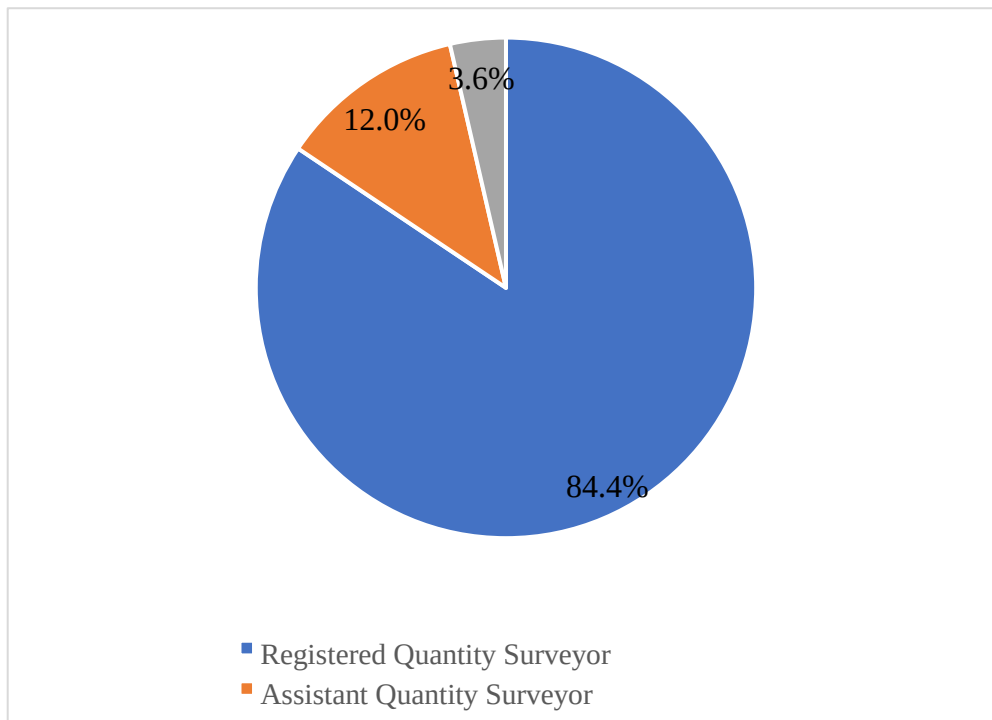


Figure 1: Distribution of Respondents' Preferred Job Titles

Source: Authors, 2025.

Further, these respondents were drawn from both public and private sectors of the industry, handling both publicly and privately funded projects. Those who selected private quantity surveying firms were the majority (36.5%), followed by construction firms (31.1%), public sector organizations (22.8%), and the independent consultancy category (20.4%). Some respondents indicated other categories, including “manufacturing company”, “bank”, and “developer”, with others holding positions in more than one organization type. The results show that diverse organizational types were represented in the study, indicating the diversity of experiences of the study participants.

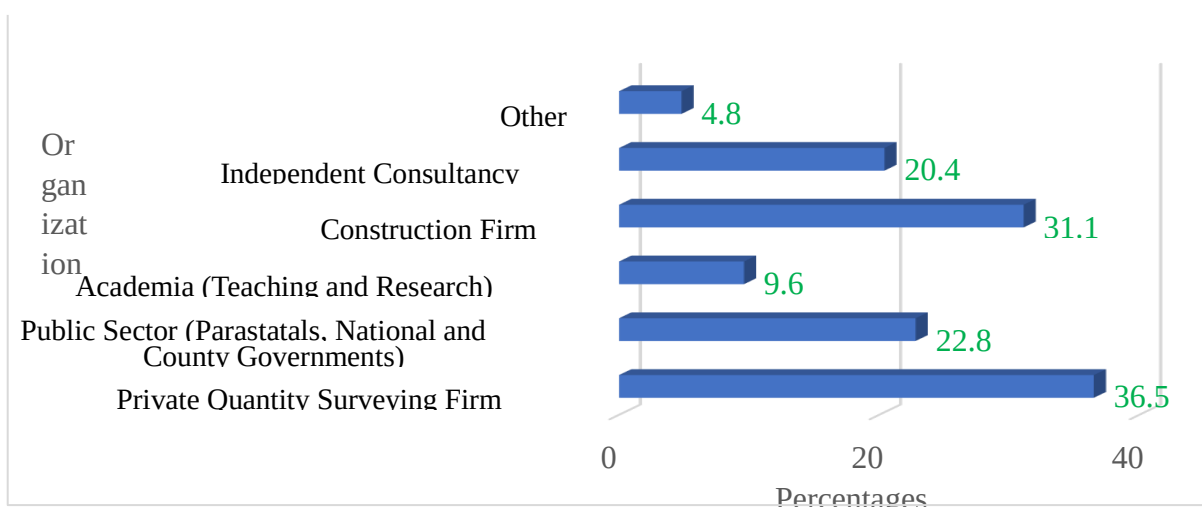


Figure 2: Percentages of Responses for each Organization Type

Source: Authors, 2025.

In terms of the years of professional experience, the “6-10 years” cohort formed the majority with 44.9% (75) share, followed by “0-5 years” with 28.1% (47), and “21 and above” contributed the fewest respondents with 2.4% (4). This is shown in Figure 3. The majority of the respondents are young, early-career professionals with experiences ranging between 0 and 10 years of professional quantity surveying practice.

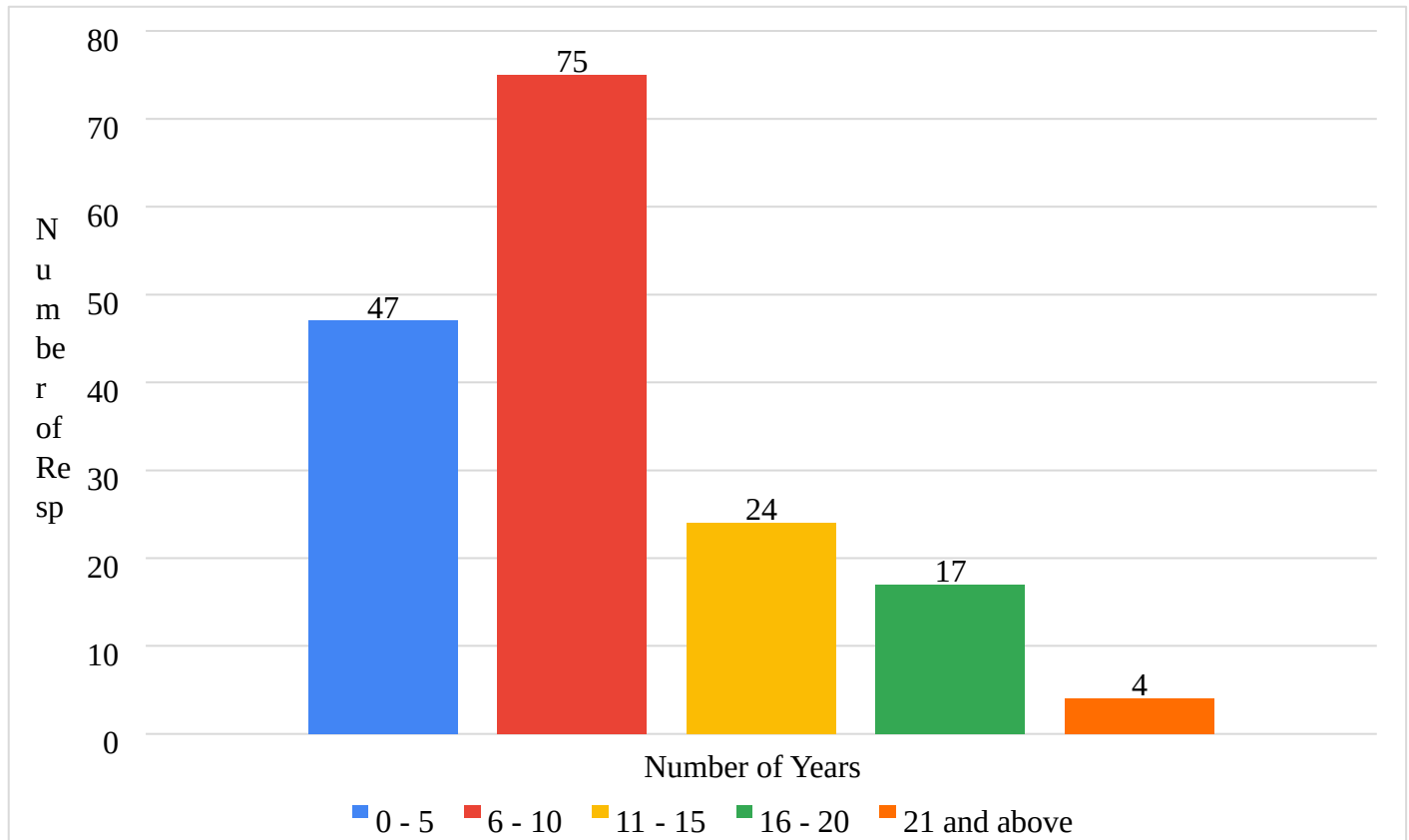


Figure 3: Distribution of Respondents by Years of Experience

Source: Authors, 2025.

Moving on, the research sought to establish the status of BIM adoption amongst the respondents. Respondents were asked whether they used BIM individually or at the organizational level. It was important to distinguish adoption at individual and organizational levels as these two are driven by different motivations. Whereas individual consultants may want to improve their workflows, match current professional trends, and keep up with continuous professional development, firms and organizations are motivated mainly by profits and the return on investment. However conflicting, both are important considerations when deciding to invest in BIM implementation. The responses were as follows:

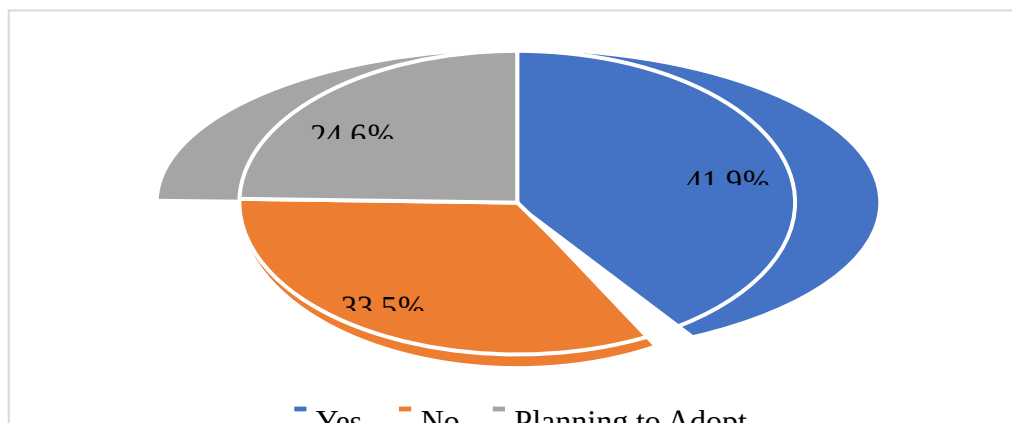


Figure 1: BIM Use by Individual Professionals

Source: Authors, 2025.

Source: Authors, 2025.

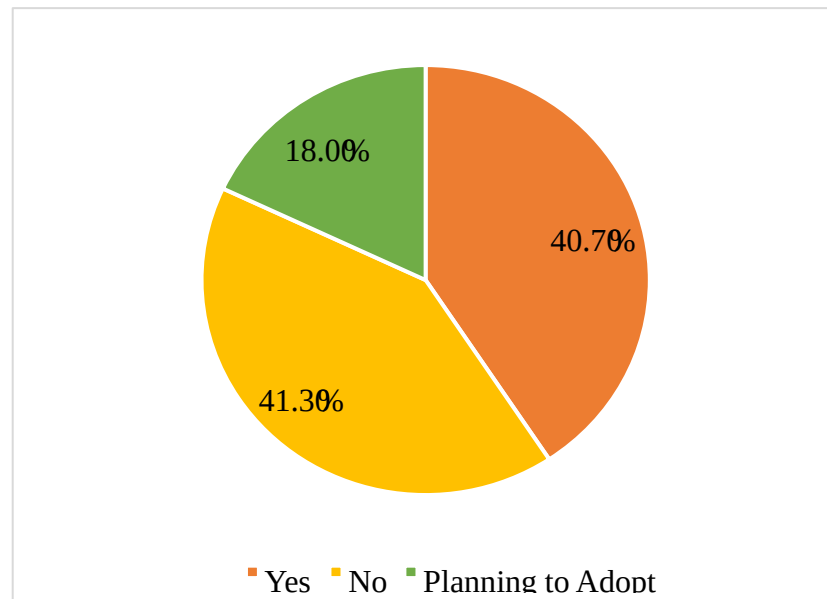


Figure 1: BIM Use at Organizational Level

Source: Authors, 2025.

It is worth noting that more individual respondents (24.6%) are planning to adopt BIM in the future compared to 18.0% of firms. This is because individual decision-making is faster, less structured compared to firms that have to go through multiple stages of discussions before the final approval by the top-level management.

Nevertheless, the trend is positive, as with more individuals adopting BIM in their personal work in the future, the impact will spread across the organizations where they work.

The low level of BIM adoption by quantity surveyors is consistent with the work of Mosse *et. al* (2020), who found an overall 38.7% adoption in the QS profession. However, there has been an improvement in the uptake compared with these findings, which indicate 41.9% in individual professionals and 40.7% at the organizational level. Musyimi (2016) found a 25% adoption level of BIM in construction project management in Kenya. 67% usage of BIM in structural design and analysis in Kenya was reported by Mwero and Bukachi (2019). Across East Africa, similar low adoption results were reported in Rwanda by Musabyimana (2021), whose survey respondents comprised 4.3% quantity surveys and reported 29% BIM awareness.

With these findings on BIM adoption levels, the research went further to probe the reasons for no BIM usage by the majority of the respondents. Several reasons had been identified, with the 97 responses by the participants distributed as follows:

Table 1: Reasons for Not Using BIM

S/No.	Reason	Frequency (N)	Percentage (%)	Ranking by Popularity
1.	Lack of experience in BIM	48	20.3	1

2.	BIM is complicated	7	3.0	8
3.	Lack of Training	36	15.3	3
4.	No client requirement for its use	39	16.5	2
5.	Satisfied with existing systems and workflows	34	14.4	4
6.	Lack of standards and guidelines	15	6.4	7
7.	Lack of government policy/legislation guiding BIM use	23	9.7	6
8.	Other consultants are not using BIM	28	11.9	5
9.	Other	6	2.5	9
	Total	236	100.0	

*The percentage is obtained by dividing the frequency of each reason by the total number of choices made by the respondents. The total for the frequencies is 236, which represents the total number of choices made by all respondents in this multiple-choice question.

Source: Authors, 2025.

The most popular reason for not using BIM in quantity surveying practice is “a lack of experience”. This was followed by “no client requirement for its use”, “lack of training”, “satisfied with existing systems and workflows”, and “other consultants are not using BIM” as the top five reasons for not using BIM by the respondents. Although a lack of standards and guidelines, and a lack of legislation and government policy guiding BIM use, come immediately after these in terms of the popularity ranking, they are not the major causes of low levels of BIM adoption in the quantity surveying practice. Similarly, Musabyimana (2021) reported a lack of training and insufficiency of skilled personnel as BIM adoption challenges in Rwanda, with Mosse (2022) citing a lack of training, a lack of client requirement for BIM use, and high cost of the software as some of the limiting factors.

The introduction of BIM into a project tends to disrupt the existing workflows, introducing new ways of information sharing and management, and software. This means that for a QS to work well, they will need to be skilled in these by either having undergone some training or learned on another job. Where these miss, they become the adoption barriers, as people will gravitate towards maintaining consistency by sticking to their existing systems and workflows. This was summarised by an interviewee who said:

“I think one of the biggest reasons, as a quantity surveyor, is the inability to embrace change... we are very relaxed with the tools that we have, we think they work for us at the moment. So, in that effect, it makes it easier for me to only use the tools I have been using or the tools that I was trained with. So that’s the biggest hindrance.”

In the other reasons, respondents indicated that the cost of implementing BIM, including purchasing the software tools, is high and does not make business sense for small and medium-sized organizations (accounting for 2.5%). Switching to BIM requires a business to acquire the relevant software, update its hardware to be compatible with the technical specifications for running this software, and train its employees. With respondents indicating there is a lack of training, this shows that cost is a major consideration in deciding whether or not to use BIM, which agrees with findings by Nasila and Cloete (2018).

Also, clients are the project owners and are responsible for arranging the financing of the project. Where professionals incur an extra cost in paying for software subscriptions, training, or upgrading hardware, these will be passed down to the client in the consultancy fees charged, which can later be recovered when the client collects rent or sales revenue from the completed facility. The client is, therefore, a key influencer of BIM adoption, depending on their willingness to absorb the risks associated with it. Where clients are interested in cost-cutting by all means, this leaves less room for supporting BIM implementation efforts, as costs are incurred first before the benefits can be reaped. The client role was best explained by an interviewee as follows:

“...the clients they are the best stakeholders to make this work. As a client, ...if you can procure a common data environment, ... and you make sure like the all the stakeholders are able to use these items which enable the usage of the IFCs and all those models..., then in that case it is affordable... to have BIM as a whole, it should come with that perspective, you know, from the client’s part. That’s what I can say.”

The BIM maturity levels at which the organizations and individuals operated received 92 responses, spread as follows:

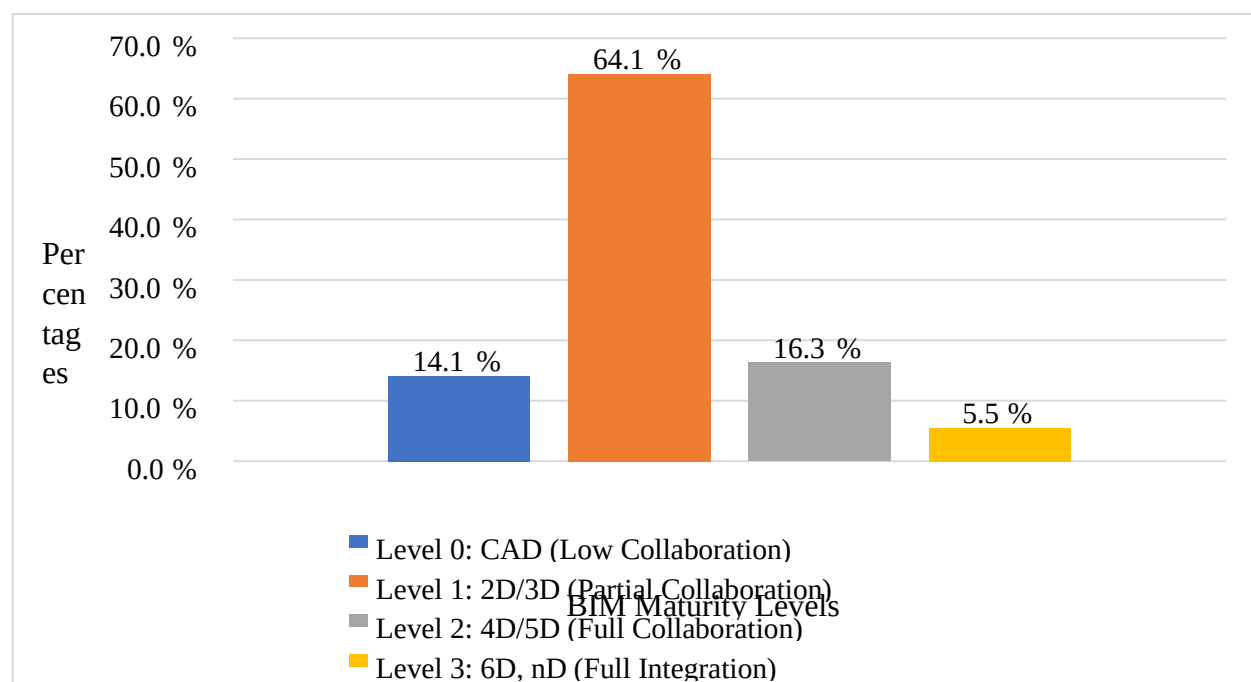


Figure 6: Percentage Distribution of BIM Maturity Levels

Source: Authors, 2025.

The majority (64.1%) of the respondents are at Level 1, characterized by a mix of 2D and 3D-based work and partial collaboration, with very few indicating that they have achieved full integration (Level 3). This makes “Level 1: 2D/3D (Partial Collaboration)” the most popular BIM level amongst quantity surveyors in Kenya. However, model-based cost estimating is well supported in levels 2 and 3, where full collaboration and integration are reached. So far, there has been limited integration, with construction team members embracing collaboration, albeit sparingly.

Additionally, respondents using BIM in their work reported various benefits. These benefits were ranked in the order of their popularity amongst the respondents as follows:

Table 2: Ranking of Advantages of Using BIM by Popularity

S/No.	Benefit	Frequency (N)	Percentage (%) *	Ranking by Popularity
1.	Better cost estimates and cost control	70	15.5	1
2.	Improved project visualization	56	12.4	4
3.	Faster quantity take-off	67	14.8	3
4.	Improved accuracy of quantity take-offs	69	15.3	2
5.	Better construction planning and monitoring	40	8.8	7
6.	Improved overall value of the project	34	7.5	8
7.	Improved communication	46	10.2	6
8.	Easier and unlimited access to project information	48	10.6	5
9.	Enhanced organizational image of the firm	22	4.9	9
	Total	452	100.0	

*The percentage is obtained by dividing the frequency of each benefit identified by the total number of choices made by the respondents. The total for the frequencies is 452, which represents the total number of choices made by all respondents, as this was a multiple-choice question.

Source: Authors, 2025.

“Better cost estimates and cost control” ranked as the most important benefit of using BIM by the respondents. This was followed by “improved accuracy of quantity take-offs”, “faster quantity take-off”, “improved project visualization”, and “easier and unlimited access to project information”, in that order. These benefits are desirable for the project, and are the drivers of BIM adoption by the quantity surveyors. Quality and speed of producing the cost estimates improves the perceived value of the QS services to the client. Accuracy is fundamental as the quantities and costs arrived at the pre-contract stage forms the basis for cost management work across all other stages of the project by the QS (forecasting, appraisals, valuations, and final accounting). The perceived usefulness of the tools in achieving this helps drive its adoption amongst quantity surveyors.

Although an enhanced organizational image and the overall value of the project are desirable benefits, the findings suggest that the most important concerns of the quantity surveyors are the quality of the cost estimates they produced and their subsequent value in the cost control process at all stages of the project. Also, faster and accurate quantity take-offs, the ability to visualize a project, and easier and unlimited access to construction project information are essential to the quantity surveyors as they perform cost management roles on the project.

As BIM implementation follows a structured process, it was imperative to investigate the practices adopted by the respondents in their work, and by the other construction project participants they worked with. This examined the production of non-graphical information and documents useful in supporting the transition to

model-based cost estimating, common work tasks, and how quantity surveyors communicate their needs. Although most respondents (58.1%) indicated that the quantity surveyors communicate to the model authors their information needs (things like specifying what file formats they work best in, data formats, level of design detail, and development they require so they can perform model-based cost estimating), those that do not adopt this practice are also a significant number (41.9%), as shown in Figure 7:

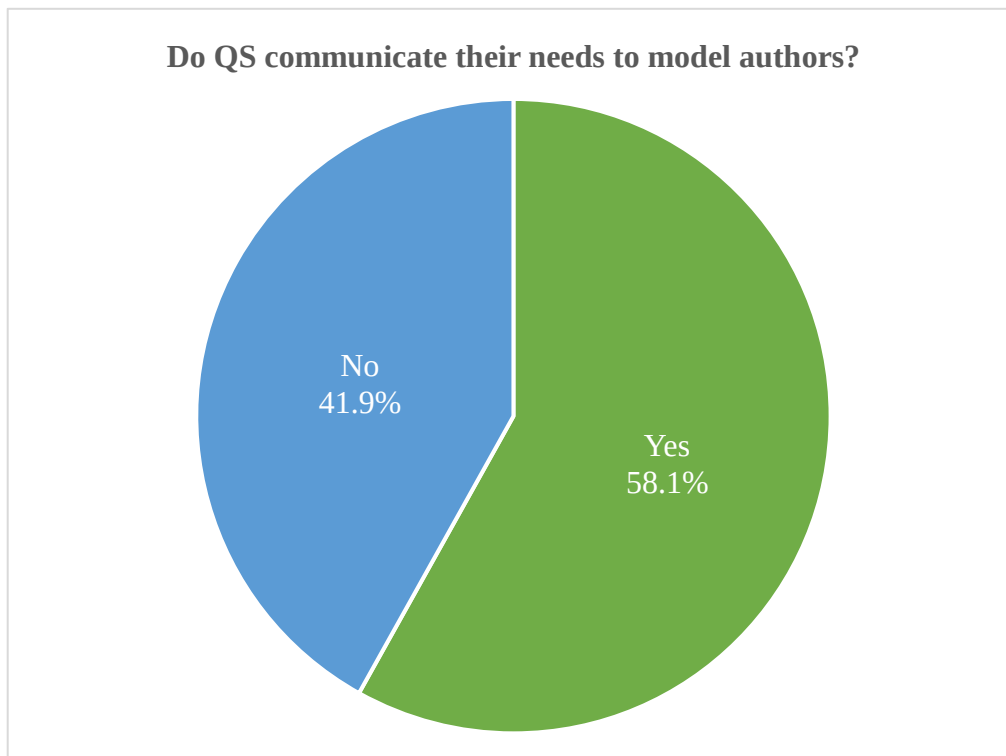


Figure 7: Distribution of Responses on Whether the QS Communicates Their Information Needs to Model Authors

Source: Authors, 2025.

This bunch approaches BIM without planning and without setting the expectations at the start of the project. This practice is disadvantageous as it means the model authors create the BIM models without knowing what the QS expects to find in the model to support their cost estimation and management work. If these expectations are not known, they cannot be fully met, even when the model authors make reasonable assumptions in their work. Consequently, the quantity surveyors miss out on the opportunity to have these models rich in data that support their work, and don't fully benefit from the automation capabilities of BIM even when it is implemented in their projects.

Further, the distribution of responses on whether they produce the indicated non-graphical information and documents was as follows:

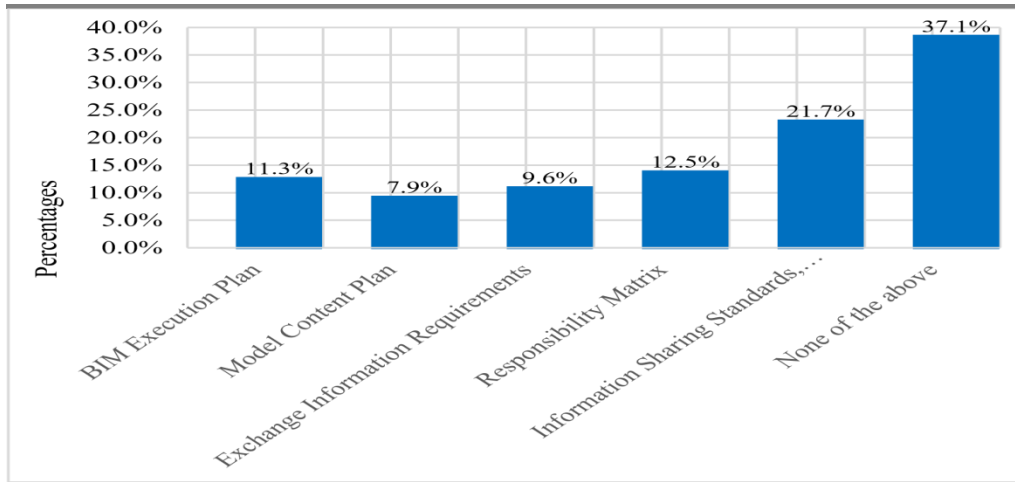


Figure 8: Status of Production of Non-graphical Information and Documents

Source: Authors, 2025.

The common practices present in the projects the respondents worked on are tabulated as follows (Table 3), with ranking in the order of their popularity:

Table 3: Ranking on the Order of Popularity of Common Practices

S/No.	Practice	Frequency (N)*	Percentage (%)	Ranking by Popularity
1.	Production of hand drawings	55	9.6	6
2.	2D digital drawings that are not generated from 3D models	94	16.5	2
3.	Use of structured information linked to 3D digital models	60	10.5	4
4.	Quantity take-off from physical blueprints	89	15.6	3
5.	2D onscreen quantity take-off from PDF drawings	108	19.0	1
6.	Extracting building quantities from 3D digital models	58	10.2	5
7.	Sharing digital models with team members in other disciplines	52	9.1	7
8.	Collaborating with project teams through a central repository for project information	52	9.1	7
9.	Other	2	0.4	8
	Total	570	100.0	

*The frequency is the number of choices made per item, with the total indicating all choices made by the

respondents in this multiple-choice question. Percentages are obtained by dividing the individual frequency by the total number of choices made.

Source: Authors, 2025.

“2D onscreen quantity take-off from PDF drawings” is the most popular practice, followed by “2D digital drawings that are not generated from 3D models”, “quantity take-off from physical blueprints”, “use of structured information linked to 3D digital models”, and “extraction of building quantities from 3D digital models” in that order. Collaboration and sharing of construction project information through a central digital repository (technically known as Common Data Environment - CDE) are among the least popular practices amongst the surveyed respondents.

It suffices to say that a mix of Computed Aided Estimating (CAE) and traditional paper-based practices is the dominant practice in the Kenyan quantity surveying practice. This is characterized by 2D onscreen quantity takeoffs and manual take-offs from printed hardcopy drawings. However, the industry is realizing the potential of model-based cost estimating, and we are seeing the use of structured information in the form of building information model data (such as building specification data) and the extraction of building quantities from the 3D digital models present in the industry.

Nevertheless, the findings suggest that BIM use in the projects is less planned and more of a by-chance implementation. Although information sharing standards, methods, and procedures, and responsibility matrices are produced as the most popular non-graphical information with the respondents (as shown in Figure 8), they are not exclusive to BIM projects. They can also be found in projects implemented through the traditional procurement routes. The BIM Execution Plan (BEP) and the Model Content Plan (MCP), which are less popular, are a set of non-graphical documents that suggest a structured and well-thought-out introduction of BIM into a construction project. The lower production of these documents suggests that the cases of BIM use identified are mainly by chance, where project participants only use the aspects of BIM that are available, without mandating that BIM has to be used in the project.

CONCLUSIONS AND RECOMMENDATIONS

The research highlighted that BIM adoption amongst quantity surveyors in Kenya is below average and at the level of partial collaboration using a mix of 2D and 3D documents. However, there is optimism that the adoption rate will increase in the future, with more people indicating that they are planning to adopt BIM. The main limiting factors identified are “a lack of experience”, “clients not requiring BIM to be used in their projects”, “a lack of training”, “project stakeholders being satisfied with the existing systems and workflows”, and “other consultants not using BIM”. Further, the findings suggest that BIM implementation is unstructured and unplanned. However, users report benefits such as “an improvement in the quality of their cost estimates and cost control work”, “better and faster quantity take-off”, “improved project visualizations”, and “access to project information anytime, anywhere, when needed”.

Additionally, the findings suggest that spreadsheet-based cost estimating and bill preparation workflow is popular, together with 2D on-screen quantity take-off from PDF drawings. Quantity surveyors are starting to embrace model-based quantity extraction, although the incompatibilities brought about by foreign work item descriptions need to be resolved to support automatic quantity extraction from the models.

From the results obtained, it was recommended that Universities, Colleges, Technical and Vocational Education and Training (TVET) centres should incorporate in their curricula general aspects of digital transformation tools, especially BIM, to train and equip the next generation of quantity surveying graduates with the technical and soft skills they need to work in BIM projects and extract value from the capabilities of the 5D BIM tools. Also, professional bodies, through their continuous professional development seminars, should consider incorporating practical BIM in their discussions to help upskill the professionals already in the industry, and contribute towards the improvement of its uptake.

The results of this study have been instrumental in establishing the current status of BIM adoption in quantity surveying practice. Nevertheless, the researcher recommends a case study of a BIM project in Kenya to quantify the benefits of BIM implementation in a local project environment and the challenges from a quantity surveying perspective. This will serve as a real-life test of BIM implementation in a live project to strengthen the local perspectives on 5D BIM.

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