

EVALUATION OF MODERN TECHNOLOGY IN USE BY QUANTITY SURVEYING FIRMS IN OYO STATE, NIGERIA.

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Abstract

This paper evaluates the modern technology in use by quantity surveying firms in Oyo state Nigeria. The objectives of the study were to identify the modern technologies in use by the quantity surveyors and the most adopted technology by quantity surveying firms in Oyo state. Primary data were obtained through the administration of questionnaire to quantity surveying firms selected from the 120 registered firms of the Nigerian Institute of Quantity Surveyors (NIQS) Oyo chapter with offices in Ibadan using simple random sampling technique. Data obtained from the survey were analyzed using the Mean Item Score.

Findings from the study revealed that the commonly used modern technologies by quantity surveying firms includes Masterbills, Microsoft packages, QScad , Work mate, Autocad, Building Information Modeling (BIM), among others while the most adopted technology by quantity surveying firms in Ibadan is Microsoft packages . The study concludes that other technologies such as BIM, Workmate and Masterbill are rarely adopted by the quantity surveying firms in Oyo state and the study recommends an intensive training for registered quantity surveying firms on various modern technologies for effective service delivery.

Keywords: Evaluation, Modern, Technology.

Introduction

Modern Technology has promised to be a reliable tool in all spheres of human endeavor. Literature has documented the relevance of technology to the industry (Shash and Al- Amir, 1997). According to Tooke (2003), the construction industry has recently witnessed a paradigm shift from traditional paper-based method of service delivery to electronic information exchange using modern technology, at least in the western world like UK. It is now evident that the adoption of modern technology can enhance construction productivity and improve communications for effective decision-making and coordination among construction participants. The ability of the industry to avail itself of technology depends on the level of usage by construction participants including the Quantity Surveyor (QS) who plays a major role in the management of project success determinants, such as cost, time and quality.

The explosive growth of modern technology has had unquantifiable impact on business systems and processes. Advancement in modern technology has made possible fundamental changes in the method of practice in all businesses and industries at different levels (Li, 2000). The global acceptance and widespread adoption has accelerated the dimensions of competition not only among organizations globally but among professions locally (Scriprasert & Dawwod, 2002). The quantity surveying firms with the aim of leveling their colleagues in other industries have embraced the use of modern technology such as internet, computing, telephoning, satellite communication and electronic mailing to perform most, if not all of their activities (Wager, 1988). The quantity surveyors' ability to avail themselves of these emerging opportunities provided by the advent of technology depends on the adoption of new technologies (Castle, 2002). Honey (1998) reported that the turn of the last century has seen a reduction in paper-based operation in quantity surveying (QS) offices in UK while electronic led-processes are leading to less dependence on taking-off sheets and other ancillary stationery. Oyediran and Odusanmi, (2005) reported that there is increasing yearly rate of adoption of computer in QS services, particularly among those QSs in their mid-career years. About 89% of the quantity surveyors have been using computer for project cost management services (PCMS). QSs' attempt to computerize their services has been more of technology driven than process driven. Four elements of cost that were rated to be high with respect to income of the QSs are cost of original

software, cost of branded hardware, cost of infrastructures to support computerization and cost of support services by computer professionals.

According to Musa (2010), quantity surveying in Nigeria is experiencing dramatic but significant changes in scope and service delivery. These changes were as a result of the introduction of the usage of software and online portals into their service delivery. Many researchers come-up with the benefits that they think is as a result of the adoption of information and communication technology. To some modern technology reduce the time for data processing and communicating information, and to improve communications for effective decision making and coordination among construction participants (Peansupap and walker, 2005), to enhance construction productivity (Liston et al. 2000). In addition, Oladapo (2006) in Oyediran and Akintola (2011) states the following as advantages of using ICT which is a subset of modern technology; makes professionals jobs easier, facilitates decision making, saving in operating cost, improve public image of users, gives users competitive advantage, enhances productivity, saves time, and improve document presentation. While, Olukayode and Adeyemi (2011) presents that reduction of workload, enhances efficiency through transaction cost savings and reduced direct procurement costs, transparency, accountability, ease of use, and speedy exchange of information, are among the benefits of modern technology.

Application of Modern Technology by the quantity surveying firms

Oyediran & Akintola (2011) affirmed that most patronized technology by quantity surveying firms is software packages. These have been employed in various quantity surveying services such as in bills preparation, interim valuations, financial statements, final account, estimating, tender evaluation, tender analysis, life cycle costing, value analysis among others. The uses of various software have afforded the quantity surveyors opportunities of carrying out their tasks more effectively. The notable among these software includes Autodesk Quantity Takeoff; WinQS; Vector; CostX; Develop; Feasibility Estimate; Cut and Fill; Digico; Ripac; QSPlus; Qs Cad; Masterbill; Building Information Model Software; Microsoft Excel. The rate of adoption of modern Technology in the quantity surveying services has been slow compared to other industries despite its information intensive nature. Honey (1998) reported that a large proportion of QSs in the United Kingdom have been using computers. In an earlier baseline study, Oyediran

and Odusami (2004) examined the state of the art of computing by QSs in Nigeria at the turn of the last century.

It was not until the late 1980s that researchers and practitioners in Nigeria began to draw attention of the industry to the advantages of the use of computers in the construction industry (Ayeni, 1989). Oni (2003) reported a low level of IT adoption in the construction industry. He also noted the lack of comprehensive IT strategy by practitioners and management. The foregoing review has discussed some elements of IT adoption and progress in IT in construction. While some of the studies examined the architectural, engineering and construction industry as a whole, others focused on specific systems and / or profession.

Inhibiting factors to the Adoption of Modern Technology

In Nigeria today, there is still no flexibility in choosing methods for cost management because of what people are custom to, the same method that was used in the olden days is still in place but in a modified version. That is why it is very difficult for people to change very easily, the following factors are among the ones that influenced the adoption of modern technology devices for construction cost management by practicing quantity surveyors (Oni, 2003; and Doherty, 1997). Mismanagement of funds and resources; Lack of training facilities, Bureaucracy; Individual's unethical behavior are identified factors inhibiting the adoption of modern technology

Various Softwares Used in Quantity Surveying Practices

There are various specialist softwares packages for performing the array of tasks involved in the practices. Below is an analysis of some selected softwares and their features; Autodesk Quantity Takeoff; WinQS; Vector; CostX; Develop; Feasibility Estimate; Cut and Fill; Digico; Ripac; QSPlus; Qs Cad; Masterbill; Building Information Model Software; Microsoft Excel.

The best QS software to be used is the one that offers significant benefits to Quantity Surveyors by improving speed accuracy and efficiency in performing the tasks with an affordable cost.

Benefits and Limitations of Softwares Available for Quantity Surveying profession

BIM Software

The era of Building Information Modelling (BIM) has arrived. Since the past few years, this term has become amalgamous to the construction industry. BIM is not simply the virtual modelling of a building; it is a key that enables information to be shared among parties in a construction project. This system is often adopted by construction companies to improve the 3 most important aspects to their projects, namely time, cost, and quality. BIM covers the whole construction lifecycle from the briefing stage all the way to the operation and maintenance of a building. As the industry shifts towards the massive use of BIM softwares for construction, the industry professionals, including the Quantity Surveyor, has taken a step forward to fully utilize the benefits that can be obtained from BIM. BIM Enhances efficiency, reduces material usage, Save time and effective, Space Visualisation, Real-time Data among other. High investment in cost, time and training; Lack of standardization and inappropriate pricing format; and Adaption against time are all constraints to BIM softwares.

Cubicost

Cubicost (Glodon) Cubicost offers four types of individual BIM-based software products, namely the Cubicost Takeoff for Architecture and Structure (TAS), Cubicost Takeoff for Rebar (TRB), Cubicost Takeoff for Mechanical and Electrical (TME), and Cubicost TBQ. Having said that, Cubicost is truly the game changer of the technology that is being used within quantity surveyors today. Cubicost is currently made available in a total of fifteen countries around the world, which are United Kingdom, USA, Finland, China, Taiwan, Hong Kong, Singapore, Malaysia, Thailand, Vietnam, Sweden, United Arab Emirates, India, Indonesia, and Philippines. Cubicost exhibits quick modeling and BIM-based quantity takeoff and also build BIM model efficiently by identifying DWG, JPG, PDF or by tracking 2D drawings. Only one click is needed to complete quantity takeoff based on model. Cubicost has the ability to generate reports by floor, element type or other conditions. Unique Reversely Check helps to trace the origin of quantities in BIM models, making it easy to check and modify quantities. It can also provide a variety of report formats and support exporting Excel for different requirements.

Costx

In July 2004, CostX was first released by Exactal. Then, it has been widely grown in many countries in the world as it is very helpful BIM tool in the construction industry. It can be used among quantity surveying, construction, development, subcontracting and more. There are various type of products under Exactal, such as CostX, CostX 2D, CostX Takeoff, CostX Takeoff 2D, CostX XL and CostX Viewer. CostX possesses the ability to support various type of files and 3D model or BIM PDF or CAD drawings can be supported by CostX without running a CAD software. Its major setback is that its application requires skilled and experienced estimator.

QSplus

QSplus is a comprehensive, efficient and cost-effective international QS software solution for quantity surveyors and cost engineers, for the take-off and production of Cost Plans and Bills of Quantities. It comprises Onscreen take off from AutoCAD and Revit drawings, it is also suitable in the procurement of fully integrated bills of quantities, cost planning and other quantity surveying tasks.

Buildsoft Cubit

Cubit is a solution that specializes in onscreen takeoff directly linked to estimating. If a user makes a change to their takeoff, it will show in real time in an estimate. Users have the ability to trace directly over imported plans to perform quantity. Also, there are a number of features in Cubit allowing users to validate and cross-reference your estimating and takeoff at any stage. Takeoff is designed to work equally well from rasterized PDF's as it does with CAD when a plan is traced over with vertex snapping or advanced drawing tools. Takeoff tools can be embedded into as many estimates as needed, and the system has drag and drop capabilities that update the estimate as shapes are moved in and out of rooms. Cubit is suitable to a wide range of users in the construction industry, including estimators, quantity surveyors, commercial and residential builders, contractors and subcontractors.

Vico Software

Vico software is a software that provides construction software and services to the commercial building industry. The building owners or the users use Vico software to reduce risk, optimize schedule on complex projects and manage costs. Vico's 5D Virtual Construction TM solutions pioneered the category of BIM for Construction, and they remain the industry's most integrated

approach to coordination, cost estimation, quantity takeoff, project scheduling, and production control.

Microsoft packages

Microsoft Packages comprises among other tools such as MS Excel, MS word, power point etc. It is very easy to use and offers high level of accuracy when mathematical operation is involved. Quantity Surveyors often employ the Microsoft Excel to prepare bills of quantities while Microsoft words is used to generate charts, graphs, tender exercise, report writing and so on. So, also the use of power point is essential for project report presentations to the clients and other design team. The shortfall of Microsoft packages is its inability to generate bills of quantities without the ancient traditional method of taking off preparations i.e. paper work and the rules of measurement were not programmed in the Microsoft packages.

Masterbill

Masterbill is another quantity surveying software that offers high level of accuracy and efficiency. It is designed to accommodate different version of standard method of measurement. It makes the work of the estimators faster and requires basic knowledge of quantity surveying for effective operations.

Research Methods.

The questionnaire was designed and administered to a randomly selected quantity surveying firms from the 120 registered members of the Nigerian Institute of Quantity Surveyors (NIQS) Oyo state chapter.

The study adopted simple random sampling to select one hundred (100) registered quantity surveying firms across Ibadan metropolis on the level of usage of various software applicable to quantity surveying practices by quantity surveying firms in Oyo state. Sixty-seven (67) questionnaires were returned representing 67% response rate, and were found suitable for the analysis of this study. Data obtained were ranked based on 5-point Likert scale and analyzed using the Mean Item Score.

It was observed that Word processor (Microsoft word) ranked highest with a Mean Item Score (MIS) of 4.68 followed closely by Spreadsheet (Microsoft excel) with a MIS of 4.63, while Ms

Project, Qs Plus, Building Information Modelling software and MasterBill followed with MIS of 3.28, 2.88, 2.80 and 2.53 respectively. The least used software are Digico, Cat Pro and Vico with MIS of 1.05, 1.20 and 1.25 respectively.

Level of Usage of QS Software.

QS software	Mean	Rank
Word processor (Microsoft word)	4.68	1
Spread sheet Microsoft excel	4.63	2
Ms Project	3.28	3
Qs plus	2.88	4
Building Information Modeling software	2.80	5
Master Bill	2.53	6
Cost X	2.28	7
Qs CAD	2.23	8
Win Qs	1.90	9
Qs Elite	1.75	10
Computer Aided Estimating (CAE)	1.73	11
Build Soft Cubit	1.70	12
Ripac	1.68	13
Vector	1.60	14
Computer Aided taking off (CATO)	1.45	15
Cubi cost	1.45	15
Vico	1.25	17
Cat Pro	1.20	18
Digico	1.05	19

Source: Field Survey (May 2018)

Conclusion and Recommendation

Modern Technology presents the profession with many challenges, threats and opportunities. Availability of seasoned and relevant technology shows there is brighter future for the quantity surveying profession. Consequently, the study concluded that greater number of quantity surveying firms in Oyo state are yet to imbibe the use of robust quantity surveying softwares

such as BIM software and Masterbill software but instead rely majorly on the usual Microsoft packages such as MS word, MS Excel and MS project. The study therefore recommends that an intensive training on the use of sophisticated and robust modern technology be encouraged on the quantity surveying firms in Oyo state for effective service delivery.

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