
AN INVESTIGATION INTO THE ADAPTATION OF INFORMATION TECHNOLOGY IN CONSTRUCTION MANAGEMENT IN NIGERIA

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ABSTRACT

Information technology (IT) usage is growing quickly. Due to a variety of obstacles, the construction sector, however, appears to advance slowly toward efficient information technology utilization. In this essay, the usage of IT in Nigeria's construction sector is analyzed. IT can help with all facets of project planning and management. Office software, computer-aided design (CAD), tool software, and communication networks are the key uses of IT in the construction industry. Software for tools comprises programs for cost analysis, quota management, quantity calculations, and steel quantity calculations. Internet based communication is the field that expands quickest. The majority of construction companies have access to external networks, particularly the internet. The article also identifies substantial obstacles to IT implementation in Nigeria's construction sector and offers some potential solutions. Because managers are unsure if major capital investments in computer systems and communication networks will ensure considerable increases in productivity and financial returns, IT adoption in the construction sector is still low. Software tools can handle simple tasks. Data cannot be transmitted effectively since information communication is still poor. Coping solutions were then thoroughly discussed in order to aid construction enterprises in making good use of IT.

KEYWORDS: Construction Industry, Construction Management, Obstacles, and Information Technology

INTRODUCTION

IT is described as "the processing, storing, transferring, and presenting of information using electronic devices and applications" (Bjork 1999). It has long been a crucial part of internal control systems in organizations. The usage of IT in the construction sector is now starting to grow quickly. Due to its distinctive characteristics that set it apart from other industries, such as one-off projects, industry fragmentation, low technology awareness and training, required upfront investment, ongoing maintenance costs, and resistance to change, the construction industry, however, appears to make slow progress toward effective IT implementation (Betts 1999). In all facets of project planning, organization, operation, and control, IT may be a huge help. In Nigeria, office use, computer-aided design (CAD), tool software, and communication networks are now the key uses of IT in the construction industry. The automation of regular processes, such as the exchange of building documents in digital format, is a key component of IT implementation in office work. In the building business, CAD is dominant. Different types of tools software can carry out various tasks, including cost evaluation of construction costs in accordance with a given bill of quantities, quota management of quota data, quantity calculation of quantities in accordance with CAD drawings, and steel quantity calculation of steel quantities. The fastest-growing segment of communication is internet-based. The majority of construction companies have connections to outside networks for data like material prices and cost indices.

However, compared to other businesses, the construction industry does not employ IT as well. The most common issues are to tools, software, and information exchange. One basic task can be solved by one kind of tool software. They cannot assist in decision-making since they are not project-focused. Data cannot be transmitted effectively since information communication is still inefficient. It's critical to assess issues with IT usage in construction and create coping mechanisms in order to assure continuing growth in IT use and productivity improvement in the sector.

NAME OF THE INDUSTRY: CONSTRUCTION

The organization structure of the construction business is distinctive. One-time initiatives are first mentioned. Every project is different in its conception, structure, and execution. The information required for the operation and the construction issues are all distinct from one another. But finding solutions to building difficulties may be aided by parallels between the current issues and those that have already been resolved. Evidently, information data and experiential knowledge are significant in building. Second, the multi-participant feature. A "temporary multi-organization" is assembled to share information while the project is being built (Alter 1999). Before solutions can be found, it is necessary for key entities to collaborate when construction issues develop to decide the proper concessions (Scott Morton 1991).

INFORMATION TECHNOLOGY APPLICATION IN NIGERIA'S CONSTRUCTION INDUSTRY

The use of information technology (IT) in the construction sector is expanding quickly in Nigeria, with offices, computer-aided design (CAD), tool software, such as cost evaluation software, quota management software, quantity calculation software, steel quantity calculation software, and communication networks, being the main uses. The fastest-growing segment of communication is internet-based. The most common application of IT is for business, namely using spreadsheets and computers for office and contract management (Best et al 1996). Building documentation are intended to be transmitted electronically. The adoption of office automation might increase cost control and internal management

effectiveness. Nearly all Nigerian construction offices utilize CAD, and the majority of architects have access to it. Software for cost evaluation, quota management, quantity calculations, and steel amount calculations are only a few of the several sorts of tools utilized in the construction management industry. With the use of cost evaluation software, the project cost may be budgeted. That is, the bidder submits competitive rates, prices, and the overall bid price in accordance with the bill of quantities, the bidding papers, and taking into consideration their own strengths and potential risks. Despite the gradual adoption of bill of quantities in project bidding, quota is still necessary. Software for quota management can help with quota database maintenance and lower management costs. How to recognize drawings is the key technical issue with quantity calculating software systems. In general, we may input more components and their corresponding sizes. The system will then likely compute amounts and provide a bill of goods automatically. Additionally, designs can be raster scanned before the system determines quantities by detecting components and matching sizes. Software that calculates steel amounts is designed to figure out how much steel is needed in building. To compute steel quantity and shape in this approach, component drawings and parameters are also necessary. The field of internal or external communication networks for information exchange has seen the fastest rise in IT use in the construction sector. The communication networks are necessary for all parties engaged in a building project to be able to communicate data and information. Teamwork and coordination may be improved when the information flow improves. For instance, a communication network may make it simpler for an estimating department to collaborate more closely with site management so that their subcontract estimates can be tracked and contrasted with real trade letting data (Heng Li, 2000) Additionally, online ordering is possible with rapid access to the pricing of commodities (such as concrete, steel, and wood). Additionally, data from earlier built projects may be transferred both within and outside.

IMPORTANT HOLDUPS TO SUCCESSFUL IMPLEMENTATION

Despite being a relatively new technology, IT use is increasingly commonplace in the construction industry. However, because of a number of well-documented obstacles, managing IT successfully is getting more difficult. One-off initiatives, sector fragmentation, a lack of client leadership, low levels of technology knowledge and training, necessary up-front investments, ongoing maintenance expenses, and resistance to change are just a few of the challenges Betts identified in 1999. (Betts 1999). The lack of personnel trained in the management, use, and support of IT, poor quality and/or quantity of telecommunications infrastructure, web-based information that is primarily in English, and the high rate of computer illiteracy among employees are some of the obstacles that specifically affect developing countries (Montealegre 1998). (De Boer 1999). The most important issues, according to a study by Love et al. (1996), were the absence of system expertise and the corresponding lack of training for implementation (Love 1996). Tuck and Mohamed (1996) highlighted a number of impediments, such as management resistance to change, a lack of both financial and human resources, and insufficient time for training (Tucker 1996). These obstacles were compiled by Rodney and Sheriff, who then assigned weights to them. According to the study, the two biggest obstacles are the relatively low level of IT awareness and the high cost of using IT. Similar to Nigeria, the biggest issue with IT adoption is that managers are unsure if major capital investments in computer systems and communication networks would result in increased productivity and financial rewards. According to a study by English (1993), the normal process of starting an IT usage in the construction industry begins when an individual or group believes that a job or operation may be made better by its application (English 1993). Because of the hazy initial justifications for investment, IT utilization in building is hindered. Senior managers are hesitant to alter work procedures,

especially if they are not sure that doing so would result in immediate benefits. Second, tools software is not project-centered and is not highly specialized. The four primary categories of tool software, as indicated above, may each solve one of four jobs. The market for building software is disorganized, which is one of the primary causes. The proliferation of software types, the majority of which are not highly specialized, is a result of numerous unprofessional software companies entering the construction market. Enhancing the capabilities of the current software is also crucial. As noted above, while using a quantity calculation software system, we must first input additional components and sizes so that the system can compute amounts automatically. Evidently, the software's automated computation capabilities are limited. Advanced techniques like simulation and knowledge-based expert systems have been used in building in several industrialized nations. Last but not least, there is still a lack of effective information interchange. Many construction companies have internal networks built up for exchanging data among employees and are connected to external networks, particularly the Internet; some have their own Web sites. However, the majority of construction companies employ basic IT tools like Local Area Networks (LAN), and the most common uses of external networks are to give relevant legislation, product prices, and information about project bids. Unfortunately, these fundamental purposes do not allow for widespread knowledge sharing. Online remote networking and other forms of innovative communication have not been widely used in Nigeria.

NIGERIA'S DEVELOPMENT OF COPING STRATEGIES

Numerous coping mechanisms have been created to address the aforementioned issues (Miozza 1998; Pena-Mora 1999; Mark 2001). Increase government investment in telecommunications infrastructure; Encourage IT education and human capital development; Use online/web-based information management systems to facilitate a common, efficient data flow systems; Publicize the benefits of adopting IT-based communication systems and quantify those benefits; Develop an IT implementation policy; Advocate for tax breaks to encourage industry to invest in IT and conduct I For Nigeria, spreading the word about the benefits of IT adoption is crucial. a) The significance of IT involves significant financial investments in computer networks and systems. So, managers wouldn't invest in IT without a clear understanding of increasing organizational productivity. In fact, over time, the company might profit more from its investment in IT. However, investing money in IT alone is insufficient. Changes to work procedures and a lack of time for employee training are further issues. Personnel with expertise in construction management and IT are needed to enable successful IT adoption. As a result, it's crucial to provide technological training and modify traditional job procedures. To address the staffing shortfall brought on by the IT implementation, corresponding management departments may design IT implementation policies and integrate technology training with talent introduction. In other words, construction administration may arrange research to measure the advantages of using IT, offer talks promoting its usage, enhance the technology training of available manpower, and introduce competent individuals. A compelling act may be passed to mandate IT training time each year and set up a check-up mechanism, among other measures, to guarantee that technology training is successful. It's crucial to expand the market for building software and improve the software already in use. Due to the disorderly market, the government should strengthen its management system to prevent unqualified software businesses from entering the market. Only those companies that are qualified could conduct software research. On the other hand, industry standards should be established, and each software business should be required to follow them while creating software. Additionally, it is anticipated that tool software capabilities would advance. Software for tools should be more project-centered, specialized, and may aid in decision-making. Utilizing an online-based information

management system is crucial to facilitating effective data flow due to the poor information communication. Create online remote networking first to achieve large-scale information sharing. Second, information provided online needs to be organized. There have been several external networks that have provided information. Unfortunately, the majority of the information provided is on paper, is not organized, and needs to be more thoroughly developed. Information that is "on-line" has been properly updated, as opposed to simply being typed into a computer from paper. Additionally, the scope of information provided online should be broad, covering all aspects of project construction, and not just the cost of goods, particularly materials.

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