

Contractor's Perspective on Information Communication Technology on the Nigerian Building Industry in The 21st Century.

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ABSTRACT: The research explored various ways of contractor's perspective on Information Communication Technology (ICT) on the Nigerian building industry in the 21st century with emphasis on ICT tools available to the professionals in the building and construction industry. This was with a view to deepening the use of the ICT innovation so as to achieve increased project delivery performance in respect of the major metrics of measurement - cost, time and quality of end product. 70 Questionnaires were distributed to respondents comprising of contractors only but 60 were returned and well analysed, which provided empirical data for the analysis with statistical package for social sciences tools (SPSS) employed for the analysis. The result obtained indicated that some internal factors, such as; the type of business (contracting), perception of the benefits of ICT and the years of computer literacy of function arises significantly, which correlated with the level of ICT use in the industry. However, the main uses of ICT in the industry were Corel draw, internet communications, and costing, work scheduling and drawing. The top five constraints to the use of ICT as revealed in pre- construction were irregular power supply, lack of sufficient jobs, poor teamwork, lack of security and inadequate training. Other constraint was due to the fact that both individual and corporate access to and ownership of ICT are still at the lowest ebb. Therefore, the level of impact of the ICT in the Nigerian building industry was low and efforts to sensitize the contractor's on the need to imbibe and embrace the use of the ICT in the Nigeria construction project delivery should be improved upon.

Keywords: Contractor's perspective, Information Communication Technology, Building Industry

I. INTRODUCTION

In the Building industry today we believe that the use of information technology has been very helpful in solving several problems such as security problems, reduction in overall construction time and home inconvenience. The use of information technology is scarcely practiced, construction data like drawings are still presented on papers, meetings between building parties are still being held on site where everyone has to be present for the meeting to hold and smart houses are hardly built due to insufficient information on how to facilitate the use of information technology. Some scholars have given various definitions based on their different perspective on the subject matter. The construction industry is said to be a very complicated and multi dimensional. This simply means that the building industry is very extensive and complex. As a result of the complexity of the building sector which consists of various building agents such as contractors, architects, builders, workers, suppliers etc. these various building agents is necessary to accomplish a successful project. Therefore, the building industry is in position where it needs to manage associations and consequently an amplified burden to diminish costs and increase efficiency by decreasing ineffectiveness.

The use of information technology can help in increasing the competence of building development. In recent times, information technology solutions in connection with tele fax machines are used immensely in business communications for the interchange of data like drawings, pictures, schedules, document, and other necessary information. For example, advanced applications of ICT such as Modeling and Visualization. Nevertheless, a number of innovations in ICT technologies have provided new chances for improving communication,

collaboration and information management in construction (Stewart, technologies, Mobile computing and internet based data interchange such as project webs, Electronics Document Management Systems, Teleconferencing and E-commerce including integrated software such as Enterprise Resource Planning (ERT) have been used to some success in many other countries. While these ICT technologies may enhance data and communication in building industry through decrease of paper document and drawings, better record organization and filing and quicker, less expensive and more precise communication streams, the rampant usage is yet to completely gain ground in the building industry when compared with numerous divisions of economy. Disregarding this, ICT has been portrayed as a vital asset in the building industry. Furthermore, contractual workers and other industry experts ought to embrace the use of ICT in the building industry and in their various building firms and organization.

The key objective of the building industry, as any other industry (that is, service, manufacturing, and E-business) is to produce its products to satisfy its customers (Akinsola et al., 2000). The building industry has numerous unique features which distinguish it from other industries, names, the fragmental nature, one-off projects and multi-participants (Li et al., 2000). According to Akinsola et al. (2000), the industry production process and the products themselves are unique compared with other industries. However, the products must be produced within clients' requirements, designer's specifications, assigned time and budget. However, the following is a more comprehensive definition to elaborate and explain more clearly, what is:

"Information technology is the technology involved in the operation, transport, collection, taking, reserve, offering access to, and transformation of information in all its forms" (Boar 1999).

Based on the aforementioned definition and according to (Sarosa and Zowghi, 2003), the term IT is defined as all technologies used by organizations to collect, process and disseminate information in all its forms. Therefore, it covers parts of IT hardware (computers, printers, scanners, etc, software (operating systems, application development languages, office applications, etc.), and telecommunication devices (moderns, hubs, network cards, network interfaces, etc).

According to a study by Akinsola et al. (2000), within the last thirty years or more, business integration and other strategies have

emerged from the manufacturing sector. Research reveals their strategies and their successful application in the manufacturing industry. Others have provided researchers with an inspiration in the building industry to adopt the initiative. Implementation of IT is one of the most strategic and effective management tools to improve productivity and competitiveness. One aspect of IT is to improve the communication and transmission of information among employees of the company or team that describes the design process management and control (Luiten and Tolman, 1999). Strategic systems when applied give positive impact to the survival and growth of businesses.

Akinsola et al. (2000) stated that one result of this strategy copied from the manufacturing process is based on the concept of "single point of responsibility" in which, the design and construction of buildings is the responsibility of an organization. The result is a huge cultural change and increasing development of alternatives and variations of existing processes. Unfortunately, this approach alone has proven inadequate in addressing the increasing complexity of building projects and especially without the support of integrated IT. Virtual project management teams have demonstrated better control of the design process and design changes as a result of using IT services. Project managers in the construction industry tend to rely heavily on efficient and stable computer networking technology to ensure the success within virtual teams. Traditional project management methods have embraced computer technology for project tracking and reporting. At the same time, virtual project management teams totally depend upon technology and cannot perform without it (Michel et al., 2000).

Computer vision is a technology that focuses on providing computers with the characteristics of the function of human vision. It can be used in the formulation of 3D objects from 2D images. An image is automatically scanned and work in progress can be measured. Thus, the use of a computer vision system is to assist the task of project management to some extent (Zhang et al., 2009).

The aim of the study is to know the benefits of using ICT in Nigeria building industry with the objectives to identify the level of use of ICT by building contractor organizations and to review the constraints factors to mass use of ICT in Nigeria building industry

II. ANALYSIS OF DATA AND IMPLICATIONS

Methodology

This study employed the use of survey research design. The choice of which was considered appropriate because of its advantages of identifying attributes of a large population from a group of individuals. The study was conducted in Ministry of Works and Housing, Nigerian Institute of building NIOB Ado-Ekiti and Richard Logu Construction Company, Ilorin Kwara state. The choice of this study area was informed by its

involvement in contractors' perspective on ICT on the Nigerian Building Industry in the 21st century.

In order to achieve a good reliability for this study, the corrected questionnaire was administered randomly. The data obtained from the field survey research was analysed by descriptive analysis using Statistical package for social sciences (SPSS). 70 questionnaires were administered while 60 were returned and found worthy of analysis. The results were presented below.

Table 1: level of awareness of the use of ICT in construction using application software

Application software	Mean	Standard deviation	Ranks
Corel draw	3.65	1.205	1
Ms –Excel	3.55	1.395	2
Auto cad	3.55	1.512	2
Q/s bills	3.43	1.345	3
Arch cad	3.42	1.430	4
Ms power-point	3.42	1.266	4
Adobe page maker	3.42	1.139	4
Word perfect	3.37	1.314	5
Snape	3.35	899	6
Ms outlook	3.32	1.172	7
Base-camp	3.25	1.159	8
Active collab	3.25	1.083	8
Master bill	3.23	1.294	9
Accounting software	3.20	1.325	10
Hive	3.17	960	11
Win Qs	3.15	1.260	12
Workzone	3.15	1.055	13
Apollo	3.15	1.087	13
Qs-Elite	3.12	1.290	14
Catpro	3.05	964	15

Source: Field survey (2019)

The table 1 above, it shows the application software utilization by the firm. The corel draw has the highest mean, Ms-excel and the drawing (autocad) rank as 2nd. The table shows that win-Qs, workzone, hive, Apollo, Q/s bills and catpro software rank at low range. It reveals that a large majority of all the respondents are performing corel draw and spreadsheet function, resource and materials scheduling and programming of work are being carried out using computer (about 3.65). Architects and Engineers that imbibe the use of specialized autocad and Ms-excel software to achieve higher effectiveness post 3.55 followed by

archcad, ms- power-point and adobe page maker has 3.42.

Generally, the level of embrace of ICT among the professionals in the Nigerian Building industry is still at a very low ebb; yet some of them attest the use of some simple and general purpose softwares such as ms-excel, corel draw, autocad, arch cad, ms-power-point and adobe page maker while few make use of win-Qs, workzone, hive, Apollo, Q/s bills and catproetc for quantity surveyors. Only very large scale companies and contractors use ICT fully.

Table 2: The Benefits of using ICT in pre-construction stage

Benefits	Mean	Standard deviation	Ranks
Enhanced productivity	3.60	1.509	1
Improved accuracy and documentation	3.57	1.577	2
Enhanced effective delivery	3.55	1.478	3
Improved time and cost performance	3.50	1.490	4
Enhanced decision making	3.45	1.443	5
Increased business turnover	3.42	1.369	6
Improved quality performance	3.40	1.440	7

Source: Field survey (2019)

Table 2 reveals that respondents appreciate the impact of ICT in pre-construction stage, even at this very high use of ICT industry with the following mean of benefits: enhanced productivity, improved accuracy and documentation, enhanced effective delivery, improved time and cost performance, enhanced decision making, increased business turnover and improved quality performance.

The Quantity surveyors, Engineers and Builders that have imbibed the use of ICT indicate high level of proficiency in using corel draw, Microsoft excel, auto cad. They appear to be moderately proficient in the computer base communication media the Email and the internet facilities.

Table 3: The Benefits of using ICT in construction stage

Benefits	Mean	Standard deviation	Ranks
Enhanced productivity	3.58	1.510	1
Improved accuracy and documentation	3.48	1.621	2
Improved quality performance	3.48	1.490	2
Enhanced effective delivery	3.45	1.478	3
Improved time and cost performance	3.40	1.532	4
Enhanced decision making	3.38	1.427	5
Increased business turnover	3.27	1.313	6

Table 3 above shows the impact of ICT in construction stage ranking the benefits: enhanced productivity has the highest mean of 3.58, improved accuracy and documentation and improved quality performance 3.48, enhanced

effective delivery has mean of 3.45, improved time and cost performance 3.40, enhanced decision making 3.38 and increased business turnover is low in the rank having 3.27 as mean.

Table 4: The Benefits of using ICT in post-construction stage

Benefits	Mean	Standard deviation	Ranks
Increased business turnover	3.55	1.307	1
Improved quality performance	3.53	1.396	2
Enhanced decision making	3.53	1.282	2
Enhanced effective delivery	3.47	1.308	3
Improved accuracy and documentation	3.43	1.454	4
Enhanced productivity	3.40	1.380	5
Improved time and cost performance	3.37	1.340	6

The table 4 above shows the benefits of using ICT in post-construction stage. The highest mean is 3.55 according to the rank is increased business turnover, followed by improved quality performance and enhanced decision making 3.53 while the mean of enhanced effective delivery is 3.47, improved accuracy and documentation is 3.43, enhanced productivity is 3.40 and improved

time and cost performance is 3.37, which is the lowest mean.

III. DISCUSSION OF FINDINGS

This research shows that, most companies in the Nigerian Building industry are not using application software, they mostly use corel draw,

auto cad and ms-excel in their firms. The software utilization by the industry shows that the industry commonly uses design drawing software (auto card) while application software like, Q/S bills, arch cad, Ms power-point, adobe, catpro and Qs-Elite are not commonly used. From the research, the main benefit in pre-construction and construction stages of ICT to the industry is that information technology has enhanced productivity of business activities. In post-construction stage, the main benefit of ICT to the industry is that ICT increased business turnover positively. Respondents however fairly agreed that ICT had enhanced productivity, improved accuracy and documentation, enhanced effective delivery, improved time and cost performance, enhanced decision making, increased business turnover and improved quality performance compared to sometime in the past in the Nigerian construction industry, due to the use of information technology in the construction industry.

IV. CONCLUSIONS

Information and Communication Technology has become the bed rock for survival and development in a rapidly changing global environment. For ICT to make great impact on the performance of the Nigerian Building industry there is an urgent need to device bold and courageous initiatives to address the daunting challenges on the path of its procurement and use in Nigeria.

The professional bodies in the building/construction industry should intensify enlightenment campaign and ICT training workshops for their members. Governments at their end and construction firms should imbibe and intensify ICT training for their employees, operatives, students and others, to ensure large scale embrace and deployment of ICT in all the sectors of the economy.

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