KWARA STATE POLYTECHNIC, ILORIN

ASSESSING THE ADOPTION OF WEB BASED TECHNOLOGY FOR PROJECT MONITORING BY QUANTITY SURVEYING FIRMS IN NIGERIA

BY

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HND/23/QTS/FT/0036

A FINAL-YEAR PROJECT SUBMITTED TO QUANTITY SURVEYING DEPARTMENT

IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF HIGHER NATIONAL DIPLOMA (HND) IN QUANTITY SURVEYING.

JULY 2025

DECLARATION

I ADEBAYO OLAYEMI ISAAC declare that this Project Work titled "ASSESSING ADOPTION OF WEB BASED TECHNOLOGY BY QUANTITY SURVEYING FIRMS IN NIGERIA" Was Carried out by me under the Supervision of QS Adeoti Bashir Olanrewaju in the Department of Quantity Surveying, KWARA STATE POLYTECHNIC, Ilorin, Nigeria and has not been submitted in part or whole in any other Higher Institution for any degree or Diploma Program, All Literature Reviews and Experts from other Sources were Properly Referenced.

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ADEBAYO OLAYEMI ISAAC **DATE**

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CERTIFICATION

This is to certify that this dissertation entitled **ASSESSING THE ADOPTION OF WEB BASED TECHNOLOGY FOR PROJECT MONITORING BY QUANTITY SURVEYING FIRMS IN NIGERIA** was carried out by, **ADEBAYO OLAYEMI ISAAC** with matric number **HND/23/QTS/FT/0036** of the Department of Quantity Surveying, Kwara state polytechnic, Ilorin, Nigeria, for the award of Higer National Diploma in Quantity Surveying.

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DEDICATION

This project is dedicated to the Almighty God, the Most Gracious, the Most Merciful, for granting me life, strength, wisdom, and the opportunity to complete this academic journey.

To my beloved parents and guardians, whose prayers, love, and unwavering support have been my greatest source of motivation thank you for believing in me even when the road was tough.

To my siblings and family members, thank you for your encouragement and kind words throughout this journey.

I also dedicate this work to all the lecturers and mentors who guided me with their knowledge and wisdom, and to my colleagues and friends whose companionship and collaboration made the process more meaningful.

Finally, this work is dedicated to every student who dares to dream, perseveres through challenges, and strives for excellence in the pursuit of knowledge.

ACKNOWLEDGEMENT

First and foremost, I express my deepest gratitude to Almighty God the source of my strength, knowledge, and perseverance, for granting me the wisdom and ability to successfully complete this research work.

My sincere appreciation goes to my project supervisor Q.S Adeoti Bashir Olanrewaju whose invaluable guidance, constructive feedback, and constant encouragement contributed significantly to the quality and completion of this study. Your support and academic mentorship have been instrumental throughout this journey.

I extend my heartfelt thanks to the Head of Department, academic staff, and management of the Department of Quantity Surveying, Kwara State Polytechnic, Ilorin, for providing a conducive learning environment and access to relevant resources.

Special thanks to all the respondents and professionals in the construction industry who took the time to participate in the survey and share their experiences. Your input was vital to the success of this research.

To my beloved family, thank you for your unwavering love, prayers, and emotional support. Your belief in my potential kept me going even in the most challenging moments. I am especially grateful to my wife and daughter for their patience, love, and understanding during the many late nights and long days dedicated to this project.

To my friends and colleagues, thank you for the shared experiences, moral support, and constant encouragement that helped me stay focused and determined.

Lastly, I acknowledge everyone who contributed in one way or another to the successful completion of this project. May Allah reward you all abundantly.

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ABSTRACT

The changes in the process of activities in construction industry from traditional based to paper based is piecemeal (Hook 2006) while project monitoring is essential tools for actualizing goals of project (Idoro 2009). This study assessed the rate of adoption of web-based technologies for project monitoring by quantity surveying firms in Nigeria. identifying the types of web-based technology use for project monitoring, investigating the level of adoption of these web-based technologies for project monitoring by quantity surveying firms, examine the effect of web-based technology on project monitoring and identifying the factors that affect the use of web-based technology by quantity surveying firms in Nigeria. 50 questionnaires were treated with statistical package for social science (SPSS) tools where frequency, percentage, mean and standard deviation was use to analyse1 the data gotten from the respondent. The result shows that WhatsApp and google electronic mail has high level of identification among quantity surveying firms, and is mostly effective in project monitoring success and accuracies while they are mostly use as alternative to site meetings. The firms believe that virus attack, lack of jobs bad networks and power supply are the major factors that affect the use of web based for project monitoring

CHAPTER ONE

INTRODUCTION

1.1 Background of Study

The construction industry has recently witnessed a paradigm shift from traditional paper based to web-based technology majorly in the western region of the world which are regard as developed countries for effective and productive service delivery. The use of Information Communication Technology in construction has been sporadic and piecemeal (Hore,2006). It Is worthwhile to understand that construction industry performs multifarious task by different professionals. However; some scholar understands that the wide range of task in construction industry as lead to some professional not accepting to be part of the industry. The construction industry is so hierarchical and fragmented in nature that some of the major participants do not consider themselves to be part of the same industry (Hindle, 2000). though Quantity Surveyors are integral member. but in the cause of project which encompasses all task in the construction industry. According to Toole (2003), this requires close coordination among a large number of specialized but interdependent organizations and individuals to achieve the cost, time and quality goals of a construction project. Maqsood *et al.* (2004) state that a major construction process demands heavy exchange of data and information between project participants on daily basis.

Construction project is also define by Nokes (2007), as a temporary endeavor designed to produce a unique product, service or result with a defined beginning and end (usually time constrained, and often constrained by funding or deliverables) undertaken to meet unique goals and objectives, from above definition the objectives of time cost and quality is identified However the achievement of these goals is done by project monitoring According to Ike et al, (2010) project monitoring and evaluation is even more critical than planning in achievement of project success. They reiterated that project monitoring and evaluation ranks highly as one of the major project success factors. RICS guidance notes 2007 define project monitoring as "protecting the client interest by identifying and advising on the risks associating with acquiring an interest in a development that is not under client's direct control (Bardon L 2016) define as the systematic assessment of the progress of a project to confirm compliance with designed objective, specification, work plan/schedule, anticipated completion time and budgeted cost. It may involve physical site visits, collection of information from stakeholders, recording and documenting work progress, seeking clarification where need be, and reporting. Project monitoring is carried out on behalf of a range of alternative client types including, for example: a funding institution, which will acquire the scheme as an investment upon completion; a tenant or purchaser which enters into a commitment to lease or purchase a property upon completion; a Bank or other development finance

company where a loan matures at the end of the development period; grant funders; or private finance initiative funders and end users. (RICS) Project monitoring and control process is done to make sure everything goes according to plan. In other words, it identifies discrepancies, handles change management, and provides feedback to update and progressively elaborate the plan (Jack, Okeke, Okechukwu & Akinola, 2016). Successful completion of a project depends on accuracy, effectiveness and timely communication and exchange of critical information and data between the project teams (Akinsola et al. 2000).

Web-based construction information management systems (WCIMS) can make use of browsers, data handling devices and other Internet technology to create a network for sharing and manipulating corporate information in a way that will assist construction project managers to complete work on time and within budget. The convergence of information services communication and computing functionality in the web-based technologies allows practitioners in construction to perform a web-based project management over internet. (Irtishad Ahmad, Salman Azhar& Syed m. Ahmed) web-based technology is acknowledged as a potent tool for accelerating socio-economic development and narrowing the gap between developing and developed countries. As suggested by Baldwin *et al.* (1999), the key reasons for implementing the web-based PM systems are combination of poor-coordination, inaccuracy and inconsistency in information sharing in most projects The Internet is an ideal vehicle for integrating and disseminating

information around a network of participating groups and organisations. It has become a cost-effective, universally accepted and readily a variable delivery system. The Web offers unparalleled communication opportunities for the construction industry, particularly its facility to accommodate a wide range of media types (text, voice, objects, etc). The implementation of web-based PM systems generally helps to achieve better communication practices, speed of construction and greater collaboration amongst the project team members (Alshawi and Ingirige, 2003). The need for increasing the efficiency of these processes via exchanging massive volumes of information at high speed and relative at a low cost has been long recognised by the industry (Dong *et al,* 2001). It is now possible for construction firms to build up local and/or global information networks with low access cost using affordable hardware and software. As a consequence, construction organization are faced with opportunities as well as challenges (Ahmad et al.1995) This requires a developing country like Nigeria to adopt appropriate web-based technology innovations for its construction industry.

However, it is suspected that not all the Quantity Surveying firms in Nigeria are making use of web-based technology facilities while some used few amongst the ICT facilities available for Quantity Surveying Practice. Knowing that the adoption of web-based technologies can enhance these activities. Web based technology are. Therefore, this paper is tending to review the process of project

monitoring, the problem faces the type of web-based technology use for project monitoring and the rate of adoption by professional the factors affecting the adoption of web based for project monitoring.

1.2 Problem Statement

For the fact that the industry as experience the changes from traditional method to web based technology for project monitoring while the evolution and advancement of technology as also change the way project are being monitor by different professional in quantity surveying firms. which as also indicate the difference between developing and the developed. Nigeria regarded as developing from previous scholars means web based has not been utilize , over years lot of scholars written about importance of ICT to quantity surveying services but project monitoring in particular which is the most important activity of ensuring goals of project has not been dealt with in relation to the adoption of web based therefore there is need to bridge the gap by investigating the adoption and its effect and factors affecting the adoption. Of web-based technology by firms in the industry

Therefore, the research is focusing on the rate adoption these technologies for project monitoring by quantity surveying firms in Nigeria.

1.3 Research Question

The following questions are field for research,

- How project monitoring is being executed?
- What are the problems of web-based technology project monitoring?
- What are the types of web-based technology use for project monitoring?
- The rate of adopting web-based technology for project monitoring by quantity surveying firms
- What are factors affecting the adoption of web-based technology for project monitoring by quantity surveying firms?

1.4 Objectives of The Study

The following are the objectives of the research

1.To identity the types of web-based technology use for project monitoring

2.To assess the rate of adoption of web-based technology for project monitoring by quantity surveying firms

3.To examine the effect of web-based technology on project monitoring in quantity surveying firms

4.To determine the factor affecting the use of web-based technology for project monitoring by quantity surveying firms

1.5 Significance of The Study

The following are the significance of this study

The outcome of this research is to educate interested audience on the level of using web-based technology for project monitoring among quantity surveying

firms in Nigeria. It will also enlighten on effect of web-based technology for project monitoring on the project productivities. It will also give information on the constraint face by quantity surveying firms on the adoption of web-based technology for project monitoring

1.6 Scope of The Study

The scope of this study is to cover all quantity surveying firms in Nigeria while the research area will focus on Quantity Surveying firms in Lagos and Oyo state and

CHAPTER TWO

LITERATURE REVIEW

2.1 Concept of Project Monitoring

Project monitoring is referred as the process or means to ensure a project is in compliance with predetermined goals of the project Monitoring and control are regarded as management functions and are processes in the delivery of a project. Enshassi (1996) describes project monitoring as the process of collecting, recording and reporting information concerning any or all aspects of the performance of a project. Otieno (2000) describes it as a continuous assessment of a programme or project in relation to the agreed implementation schedule or plan. Mawdesley, Askew and O'Reilly (1997) identify 16 sources of records for project monitoring describing the documents produced through a number of activities, or strategies, that constitute project monitoring. Four of these activities, site visit, site meeting, interim valuation and financial statement, were selected to represent project monitoring in this study. Interim valuations refer to the report of valuations carried out periodically, such as monthly or bi-monthly, to determine the value of the work completed by the contractor in a satisfactory manner. Financial statements refer to the statement of the account of a project inclusive of payments received from certificates and expenditures. The level of project monitoring can be considered from the perspective of the regularity or time interval of these activities. Enshassi (1996) emphasizes the importance of

monitoring projects at frequent intervals and on a timely basis. e. Periodical: routine f. Mostly deals with primary data. Mostly deals with secondary data. More reliable less reliable

Monitoring is a continuous process which compares (assesses the ongoing performance of a projects input, activities process/ and outputs with actual standards?

Monitoring is the process of collecting and analysing information, and using that information to improve our work and help work management as well? It is a tool for identifying strengths and weakness in a program and for making good and timely decisions. If monitoring is done well it is easier to evaluate a project) program or a piece of work effectively, which helps to formulate a future action plan to operate a project) program successfully.

Monitoring is a periodic measurement of inputs, activities, and outputs of an undertaken project during implementation towards achievement of the plans against them. It is the periodic collection and analysis of selected indicators to enable managers to determine whether key activities are being carried out as it was planned Monitoring and control are often regarded as a single activity because they are both project management functions, sequential and closely related. Anthony (1965) acknowledges their relationship but regards them as separate activities because monitoring leads to control. Ritz (1994) describes control as the work of constraining, coordinating and regulating actions in

accordance with plans to meet specific objectives. Control is, as a process, distinguishable from monitoring by a number of activities through which schedule slippage in project performance is corrected. Odiorne (1965) identifies three of these activities as rescheduling activities, reallocating resources and altering project objectives. Kursave (2003) reflects that monitoring and control ensure that all of the changes are incorporated into the original plan. Programme updating, plan review, objective review and scope review were selected as the activities to represent project control. Programme updating describes the activities concerned with incorporating changes into the original plans. Project plan review describes the adjustment of project plans, potentially translating into new plans. Project objective review refers to the adjustment of project objectives to align with the project status, while project scope review refers to the adjustment of the scope of work in the project. The level of project control can also be considered from the perspective of the regularity of these activities.

2.1.2 Purpose of Project Monitoring

As Faniran, O and Lenard (1998) stated, the purpose of carrying out these project monitoring and control strategies is to complete a project within a scheduled time and cost and to a specified quality standards. This understanding shows that monitoring and control cannot be separated from project performance. Naoum (1991), Ling and Chan (2002) and Thomas et al. (2002) use project performance as the basis for evaluating the effectiveness of project delivery processes.

Nahapiet and Nahapiet (1985), Naoum (1991), Thomas et al. (2002), Ling and Chan (2002) and Ling et al. (2004) describe project performance as the assessment of project success and use objective factors, including time, cost and quality objectives, and subjective factors, which are concerned with the assessment of stakeholders' satisfaction. This study used four objective variables: time and cost overruns, percentage of time overrun to the initial contract period and percentage of cost overrun to the initial contract sum. Naoum (1991) describes time overrun as the difference between the planned and actual contract periods and cost overrun as the difference between the initial and final contract sums. Phil Bartle (2007) says Monitoring provides information that will be useful in:

- Analysing the situation in the community and its project;
- Determining whether the inputs in the project are well utilized
- ; Identifying problems facing the community or project and finding solutions;
- Ensuring all activities are carried out properly by the right people and in time;
- Using lessons from one project experience on to another; and
- Determining whether the way the project was planned is the most appropriate way of solving the problem at hand.

2.1.2.1 Objectives of Project Monitoring Are as Follows

- Identify the actual status of long-term sustainability of the project in order to determine if scheduled activities and expected output are being implemented (achieved as planned.
- discovers gaps and deficiencies in project implementation as well as current and potential issues (problems that need to be addressed.
- Identify factors that may affect the long6term sustainability of the project.
- highlight significant features that may serve as insights for the planning and implementation of future similar projects.
- Identify opportunities and strengths that can be tapped to ensure successful project man recommend policy options for effective and efficient project management and implementation.
- document initial success stories that may be useful for social mobilization and advocacy or for replication in related project.

Immediately inform project management and administrators of the status of project implementation so disseminate the results of the monitoring to the project managers, planners, donors and other sponsors. objectives of project monitoring should be specific Measurable achievable (attainable result-oriented Time-bound, as set by the project objectives that are specific

help to clarify goals, provide direction to the activities, guide the selection of data and provide a basis for assessing the overall value of evaluation.

Measurable objectives help provide outcomes that are observable and demonstrable.

Achievable objective should be attainable on the basis of the available financial and material resources and the technical demands of the methods to be employed, as well as capabilities.

objectives should be time-bound and should be achieved within a specific time frame.

The purpose of monitoring is to provide program managers, staff and people involved with sufficient information to make the right decisions at the right time. It is the process by which everyone involved can assess their strengths and weakness, and amend the directions of the project. The needs for monitoring are

Monitoring results produce the exact operational performance of the project. 8ased on the results, the project management can judge the needs for improving the day6to6day activities.

 The project management is accountable to stakeholders and donors. Monitoring results tells the management whether the beneficiaries are getting what they are supposed to get, and if they are getting whether they are receiving them through the planned process, and within the budget of activity implementation.

The failure of the development projects is often due to faulty or incomplete e implementation of intervention rather than in effective solution. Monitoring results inform the management if the activities were implemented following the criteria.

Monitoring results help the management to judge if the activities remain useful for the beneficiaries. Thus, monitoring results is crucial for the management to decide if the intervention should continue, or the duration of the project should be expanded or the project should be terminated.

2.1.3 Process of Project Monitoring

virtually it is understandable that project monitoring is very wide based on the interest of goal predetermine to archive Project monitoring helps to track project performance and progression using key performance indicators (KPIs) agreed during project planning.

Core to this phase is identifying when a change is needed, what the change entails, and how to implement the change with minimum impact on the direction of the project.

This careful, informed consideration will help prevent scope creep or the impact of small changes to the original project plan.

As the project manager, you must ensure the project includes the work required, and only the work required, to deliver the project successfully.

Techniques and tools for project monitoring include status reports, real-time dashboards, scoreboards, Earned Value Management, and milestone tracking.

Project Monitoring Methods and Techniques

Windsor (2018) says Project monitoring begins during the planning phase of your project. During this phase, you should decide what project success will look like and how to measure this goal using key performance indicators (KPIs). Consult with your team and the project sponsor on your definition of success. This can refer to delivering the project on time, within budget, or at an agreed standard. Document your definition in the project charter, and make sure your team understands the purpose of the project before any work starts Next, define two to five KPIs to track and measure your success. Suggestions include:

Cycle time – the time needed to complete a task.

Number of adjustments to the Schedule – how often the project schedule has been modified.

Budget Variance – how much the actual budget varies from the project budget?

Number of errors – the number of times you need to redo work. the process of project monitoring is widely varied and this process has been conceived in different perception by scholars in the industry a. omotara (2007); At the most basic level, project monitoring is concerned with input and output. General sequential steps in project monitoring include, among others:

Recording and comparing actual and planned performance based on time, cost and standard;

Identifying any deviations between the two (quality and quantity) and the root causes of such variation

Taking corrective action(s). These steps are mutually reinforcing and if properly carried out could lead to successful completion of a project this are partial input steps that is need to be taken

Verbal communication

This is probably the most effective mode of communication. Among its advantages is that it is quick, and its presentation can be adapted to concerns and questions of the audience.

However, this type of tool to communicate monitoring information can lead to misunderstandings and sometimes denial of information.

Meetings

The very nature of project / programme management makes it inevitable that certain meetings are convened to communicate and share project information. Other programmes may even require standing committees where outsiders may be invited to review programme performance. One needs to be cautioned that, while it is important to have meetings, they should be used as effective tools. Meetings can be used for sharing and

interchanging information, clarifying, stimulating, and seeking the best solutions regarding project performance.

Reports

The importance of monitoring reports should not be overlooked. It should be noted that these are an essential part of project / programme monitoring. Activities undertaken, inputs supplied, money disbursed, etc. have to be recorded and accounted for.

However, reports are only effective if they are submitted to the right people at the right time to facilitate corrective decision making. Diary notes

While most people do not use this mode of recording information, it remains an important option. It is essential to record key decisions, which may have been made at formal or informal meetings. Its format should be simple – giving the date, time, place and the names of the people present when the decision was taken.

However, experience from many countries (developing) indicate that some of the problems in general would include:

• Most reports gather dust in offices without being effectively used.

• Sometimes the wrong information is collected, which may not be useful in decision-making.

• Some departments or units do not have the necessary logistics – e.g. paper, typewriters, etc. – to write reports.

• There has normally been no feedback on the reports presented to higher authorities.

All the above need to be actioned upon to ensure those maximum benefits of this are attained.

Preparation of monitoring reports

The purpose of a project monitoring report is to provide information to assist stakeholders in comparing

performance against plans so that current or potential problems can be identified and analyzed.

The uses of project monitoring reports are to:

• document completion of project activities;

• identify significant deviations from plans;

• reveal problems to appropriate stakeholders;

• assist in corrective decision-making;

• monitor implementation of corrective actions;

• identify shortcomings of existing management and monitoring systems;

• provide information for coordination of national development programmes;

• provide reference material for planning of subsequent projects; and

• provide information for future evaluators.

Potential limitations of project monitoring report

Some of these include:

• They tend to focus on a pre-determined set of data for information.

• The attitude of the persons doing the reporting may cause them to hide problems.

• They may emphasize problems rather than opportunities.

• They may not be shared with those who provided the data.

• The information may be too subjective.

On the other hand, some advantages of good project monitoring reports are:

• They provide the regularized flow of information needed for decision-making.

• They provide a history of the project which can be the basis for lessons learned and evaluation of the

project.

• They assist in fostering discipline among stakeholders.

• They may give sense of responsibility to the target group.

• They can be used to identify skill building needs of those responsible for collecting data and preparing

the reports.

2.1.4 Benefit of Project Monitoring

(according to *World Meteorological Organization*) Monitoring, in itself, should not be seen as having an inherent value. The value of Monitoring does not come from conducting Monitoring or having such information available; rather the

value comes from using the information to monitor, guide and control implementation for enhanced performance and better results

(*World Meteorological Organization*) Using Monitoring information is key to an iterative management process, in which implementation decisions are based on real-time monitoring information and learning from past experience (evaluative information). M&E furthermore becomes a critical tool for demonstrating results as part of accountability to stakeholders. Monitoring, when used to inform decision-making, therefore has the potential to contribute to more cost-efficient and effective results and ensure that future projects and programmes, from the on-set, adequately take into account lessons learned from the implementation of past activities.

countries have also reported a number of benefits from using performance information, not least the fact that it generates a sharper focus on results within government. The process also provides more and better understanding of government goals and priorities and on how different programmes contribute to them.

2.2. Quantity Surveying in Nigeria

A quantity surveyor is a qualified professional responsible for drawing up bills of quantities and advising the client on contractual and financial matters Usman Said and Yahaya2006. More so Ashworth and Hogg (2002) define quantity surveyors as those that cost design, and produce procurement and construction document.

Professional Quantity Surveyors in Nigeria are practicing under the umbrella of the Nigerian institute of Quantity Surveying (NIQS). The Nigerian institute of quantity surveyors was founded in 1969, and then operated under the lands perpetual succession Act to which it was registered in 1970.

The regulated and other professions (miscellaneous provisions) Act 1978 recognised quantity surveying profession as one of the scheduled professions while the degree No.31 of 1986 gave legal backing and recognition to the quantity surveying profession, and also set up the Quantity surveyors registration board of Nigeria (QSRBN) to regulate the profession

In addition, the vision and mission statement of the Nigerian institute of quantity surveyors are: the vision is to be the profession in Nigeria responsible for total cost and procurement management, for the achievement of client's objectives in all types of capital projects and developments, from conception to commissioning and maintenance, in all sectors of the economy, for the attainment of sustainable national development and goals. While the mission statement is promotion of quantity surveying principles of construction economics, costs, procurement and

management as sine qua non for effective delivery of all types of capital projects and developments from conception to commissioning and maintenance in all sectors of the economy. Likewise, among the aims and objective of the institute are:

To promote the science and practice of the quantity surveying profession in all its ramifications.

To provide a platform or forum for meeting and discussing matters of mutual interest to quantity surveyors in Nigeria.

To undertake research study and to collate information from any quantity surveying bodies from any part of the world on the latest development and technologies in the practice of quantity surveying and make available such information to its members.

The maintenance of the highest standards of discipline and professional conduct. Thus, all aforementioned vision, missions up to the aims and objectives of establishing quantity surveying profession is toward effective accomplishing client's objectives and sustainable cost management, but achieving these purposes has been affected by so many traditional or cultural aspects. According to Aje and Awodele (2007) is "a professional trained, qualified and experienced in dealing with problems relating to construction cost, management and communication in the construction industry". Then, Oke et al. (2010) state that the problem lies in

the management of construction projects which entails cost and communication. This should be the area of concern to Nigerian quantity surveyors in discharging their duties since a well-managed project is always a well delivered project.

Furthermore, the business of the construction worldwide has seen an emerging demand for construction projects which embody whole life value and performance, excellent design and functionality; and which are delivered within budget, on time and defect-free, but this encompasses dealing to a large extent with information. According to Musa et al. (2010) practicing quantity surveyors are to ensure that resources are utilized to the best advantage of the society by providing financial management for projects and cost consultancy services to the clients, designers and contractors during the construction process. Also, Nigerian institute of quantity surveyors (NIQS) (1998) state that they are more concern with the financial probity in the conceptualization, planning and execution of development new and refurbishment works. They listed the major services of consultancy practice in project development chain to include:

- preliminary and final budget estimate;
- contract documentation and procurement;
- contract administration;
- cost modeling and final accounts.

All these cannot be achieved without efficient and effective transmission and dissemination of information. The practicing quantity surveyor is expected to source for data (market survey) both internally and externally, process the data to decision friendly and disseminates it at appropriate time to users at various stages of construction process.

Therefore, construction business needs to manage information and exchange it both between their employees and with their suppliers and clients. Oyediran (2005) asserted that there has been some rapid progress in the application of ICT in commerce particularly in financial services, this is because of the seamless communication nature of ICT, and the construction industry has been sluggish in adoption of ICT despite the amenability of its process to IT operations. This sluggishness can be traced to conservativeness of the industry, high degree of

2.3. Historical Background of Web Based as Monitoring Tools

according to Maqsood et al. (2004), a major construction process demands heavy exchange of data and information between project participants on a daily basis. a core issue in the drive for increased productivity in the

construction industry is the effective management of information, both in the form of

information flows that permit rapid inter-organisational transactions between project

participants, and in the form of information accumulated, coded and stored in firm database

structures (Mohamed & Stewart, 2003). Thus, from quantity surveyors, a basic competency in data, information and information technology is required (RICS, 1998), while from engineers, the availability of computer facilities is a measure of technical capability (Ng & Chow, 2004).

In the case of architects, the effective communication of design information to contractors is a key performance criterion (Oyedele & Tham, 2005). It has become a tactical necessity for these consultants and other project participants to integrate their information systems with each other to improve the flow of information between them and enhance the effectiveness of decision-making (Li et al., 2000). The adoption and use of ICT facilitates this much-needed integration in the construction industry (Li et al., 2000; Liston et al., 2000; Mohamed & Stewart, 2003).

2.3.1 Web-Based Construction Management Systems

By providing an efficient central data facility it is possible to create and maintain goals, schedules, standards, policies and procedures that are shared by all of those involved in the construction process. Common features of such systems are: ~ Access to project information is possible from anywhere and at any time through the Internet. ~ Team communication, collaboration and decision-making is improved through the increased transparency in the management process. ~

Handling of data is cost effective and not prone to errors and delays caused in duplication. ~ Project management is controlled and systematic. Updated information on progress is available to all and shared as soon as it is available. ~ The quality of project data is high and meets the real needs of the professionals involved, as a result of the timely transmission of information between designated parties, use of specified task specific formats, data accuracy and backup in well-defined and powerful database repository

From

2.3.2 Uses of Web Based in Quantity Surveying Profession

Cost Planning, Cost Modeling and Cost Monitoring: Computers and ICT facilities allows for the extraction of costs per Work Group, Element, Work Breakdown or any other (single or multi-level) sort order which aid Cost Analysis. ICT facilities allow for the extraction of Costs at any level within a project which help to create Budget Estimate/Cost Plan. The cost data stored on a previous project can be retrieving for re-used on a similar with some adjustment to it. Monitoring of the cost plan can be done through ICT facilities.

Cost Report/ Financial Review: Computers and ICT facilities allows QS to prepared monthly review of a project based on the contract value showing all extras/ savings as project progress to final cost. And they are distributed on web-based platform

Project Scheduling Production And Monitoring: Computers and ICT facilities can be used to create initial forecasts based upon limited information using a standard S Curve through to more detailed forecasts created by linking the BQ Items to the Contractor's Programmed and can also be used to record actual progress assessed for Interim Valuations which will enable accurate predictions for Completion Dates and Final Account Costs to be made using Earned Value Analysis (EVM) features. ICT facilities could also use to monitor progress of on-going work so as to determine if the contractors are working according to schedule.

Cash Flow Forecasting: The use of computers and ICT facilities allowing projections to be made on any type of construction project with any length of contract period and any retention period. Expenditure Forecasts for multiple projects in one combined Cash flow made easy with the aid of ICT facilities. It will enable QS to produced accurate cash flow forecasts. ICT facilities gives QS the ability to allocate BQ or Cost Plan items and their associated costs to the tasks on the Contractor’s programme will provide a more realistic forecast and enable closer monitoring of the actual spend as it is updated by each valuation, this allows Cash flow monitoring and revised forecasts to be produced. Cash Flow Forecasting ICT facilities will even work out how long it thinks a project will take based on the actual expenditure achieved. ICT facilities Cash Flow Forecasting will produce either tabular or graphical output that is clear and presentable for

Quantity Surveyors and Clients alike and can be exported if required. Computers and ICT facilities will enable Quantity Surveyors to accurately predict and monitor a Project's Cash Flow from Inception to Completion

2.3.3 Limitation to The Use of Web Based Technologies for Quantity Surveying

Despite the adverse benefit of web-based technologies in the performance of quantity surveyor activities where by accuracies time frame performance promotion of firms' image and majorly easy dissemination of information and communication for successful project monitoring there are still inhibiting factor discouraging the use of web based Olanrenwaju R. A listed part as follow:

- Proliferation of Software Application.
- Virus Attacks.
- Project Information Discouragement.
- Lack of First-Hand Software.
- The high cost of innovating/learning a new technology
- Initial setup cost e.g. Computer, Software, Network Costs etc.
- Lack of Management Desire and Appreciation of Software.
- High rate of Obsolescence of Software.
- Network problem.
- Myth factors.

- ❖ Lack of soft skills for professional's interaction/Lack of the necessary computing skills amongst staff.
- ❖ Insufficient/erratic power supply.
- ❖ Fear of over-investing in IT.
- ❖ Resistance to reengineering/organisational change.
- ❖ Lack of awareness by senior management of the opportunity's IT presents.

In view to above listed factors Usman Said and Yahaya grouped them into four prominent section which are operational factors, management attitude, profit and income factor and external factors

2.3.3.1 Operational Factors

This are factor that inhibit the use or mode of web-based ICT which tends to lead to discouragement

Virus Attack: Virus attack is a general and common phenomenon in the computer world. Virus are written programme that are harmful to the computer system. When this attack occurs, the system may stop working

Proliferation of Software Application: The production of software applications for QS without due permission, constitute a risk to the product and the industry. Nuruden *et al*. (2010) states that proliferation of software applications for QS

practices is indeed a major risk. The risk inherent therein is, they may not perform well as they are supposed to be reliable and durable even at the long run.

In most cases they do not accommodate changes made of some aspect of the software as an improved on by the means of updating and this may limit the use of ICT facilities. Usman en tal says Regarding the extent to which software is a contributing factor to the poor implementation of ICT. Software could discourage project information sharing when different applications are used or when data is imported into a different file format, poor communication among professionals especially on the location of information on the data base, data standards are not compatible due to poor information.

Incompatibility in Software Packages: Regarding the extent to which software is a contributing factor to the poor implementation of ICT. Software could discourage project information sharing when different applications are used or when data is imported into a different file format, poor communication among professionals especially on the location of information on the data base, data standards are not compatible due to poor information sharing between pre-contract and post-contract activities. Incompatibility between difference disciplines of the design team discourages/limits ICT usage.

High Rate of Obsolescence of Software/Hardware: It is of interest to note that on a daily basis improvement are being made on existing software. The rate at

which the existing software becomes obsolete as a result is alarming, requiring that software need to be updated frequently and those that have not the facility will have to purchase another one. This could lead to stoppage of work or abandonment as a result of non-availability.

Lack of First-Hand Software/Hardware: the pirated/trial copy/vision of most ICT facilities cannot perfume full function of the original copy while most trail vision have limited duration of use. Due to these reasons lack of first-hand software tends to affect/limit the uses of ICT facilities.

2.3.3.2. External Factors

These are factors that is beyond the control of user majorly base on the traditional background or socio-economic influence surroundings the user

Network Problem: In this case fault from internet providers may render the network inaccessible at an urgent time, rendering the whole related work force redundant. These kinds of services make the professionals to be frustrated and abandon the use of ICT.

Insufficient/Erratic Power Supply: Insufficient/erratic power supply, since ICT facilities cannot be use without power supply the level of power supply in the country also affect/limit the usage of ICT facilities.

Myth Factors: The believe by some QS that ICT facilities will makes other professionals to encroach on QS jobs, QS believes computer raining and usage is for the coming generation while some believed ICT facilities is capable of creating unemployment for QSs. These believe and other myth factors tend to limit the usage of ICT by QS firms.

Lack of Awareness by Other Parties in Project Monitoring: the inability of others involves in monitoring project also limit the use where by activities will be difficult to carry out

2.3.3.3. Management Attitude

Lack of Management Desire and Appreciation of ICT: The management of firms seems not to be providing the necessary leadership for strategic computerization of quantity surveying services; they felt that computerization is not necessary. This may be as a result of problematic experience management has had relative to the use of software's/hardware's. The lack of adequate training in the use of these software's/ hardware's may result in erroneous result and the resultant loss of job, cost increases that will put the firm in a bad, secondly these software's get outdated too quickly and may be another reason... This may lead to management lack of desire for their usage. That is why support of the management is very weak and weak IT strategy this result to non usage of ICT facilities by the QS firms.

Lack of Soft Skills for Professional's Interaction/Lack of the Necessary Computing Skills Amongst Staff: This item is depicting that how professionals are interacting with each other has effect especially based on soft skills such as people management, communication and integration management, team building and management, culture and industry norms and the like. If professionals cannot deal with these soft issues, it becomes difficult for them to use the ICT to share information and since the facilities cannot work without the input of a man, therefore, lack of necessary computers skills amongst the QS limit the use of ICT facilities available.

2.3.3.4. Profit and Income Factors

Low Return on Investment/ Job Sizes and Fees Not Enough for ICT: The costs of this software's are very high. It is an organisation that securing job steady can afford them. That kind of organisation that is always out of job may not be able to purchase them for use.

Lack of Management Support

The management of firms seems not to be providing the necessary leadership for strategic computerization of quantity surveying services; they felt that computerization is not necessary. That is why support of the management is very weak and weak IT strategy (Oyediran and Odusami, 2004; Oni, 2003).

In general, according to some researchers like Oladapo (2006) the following factors are the one that constraints the acceptance of ICT devices:

a) Insufficient/erratic power supply,

b) Job sizes and fees not enough for ICT,

c) High cost of hardware/software,

d) Fear of virus attack,

e) High rate of obsolescence of software/hardware,

f) Inadequate ICT content in construction,

g) Scarcity of professional software,

h) High cost of engaging computer staff,

i) Lack of management desire and appreciation of ICT,

j) Security,

k) Low return on investment in ICT,

l) Personnel abuse, and

m) Fear of ICT making professionals redundant.

In addition, Rezgui et al., (2004); Brewer et al. (2005); Pasupathinathan and Pieprzyk (2008); asserted that the reasons for the relatively low adoption of ICT are as follows: issues relating to the legal ramifications of electronic communications, vague security framework, and issue of trust. Furthermore, organizational and human issues have been highlighted as the key factors affected the use of technologies in the construction sector (Olukayode and Adeyemi,

2011). Likewise, Oyediran and Odusami (2005) state the following factors as those that are responsible for the slow acceptance of ICT by quantity surveyors:

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CHAPTER THREE

RESEARCH METHODOLOGY

3.1introduction

This chapter consists of the research methods to be used in carrying out the study. It includes research design, location of study, target population, sampling procedures and sample size, research instruments, validity and reliability of research instruments, data collection procedures and data analysis techniques.

3.2 Research Design

Babbie (2001) defined research design as the process of specifying exactly who and what to be studied, when, how and for what purpose. Langen (2009) defined research design as "a blueprint for conducting a study with maximum control over factors that may interfere with the validity of the findings". Therefore, Research design is the patterns or guide which specifies the type of information to be gathered including the source of data and the procedure used in collecting them. Research design used for this study is the quantitative and qualitative research approach.

3.3 Area of Study

The area of study is Nigeria but the data used for this research are obtained from Lagos and Ibadan mainly which is a south-western part of Nigeria while statistical inference is used to spread across Nigeria.

3.4 Target Population

The targeted populations for study are the registered Quantity Surveying Firms that carried out quantity surveying activities. And a total number of firms present in Oyo and Lagos state is 72 in totals with Lagos 57 constituting79% while Oyo 15 firms which is 21% (**source niqs.org.ng**) it is here by acknowledge that quantity surveying firms involves in many activities but project monitoring as part of activites carried out by quantity surveying firms project monitoring carried by quantity surveying firms in Nigeria is considered for this study, and the results are intended to provide data for the adoption of web based for project monitoring in Nigeria

3.5 Sample Size and Sampling Procedure

A sample is a finite part of a statistical population whose properties are studied to gain information about the whole Webster (1985). It is the act, process, or technique of selecting a suitable sample, or a representative part of a population for determining parameters or characteristics of the whole population. Sample is very important to research because the sample could help determine the validity of the result derived from the research.

3.5.1 Sample Size

The sample size for this study was based on the 95% confidence level and 5% margin error, according to (Krejcie & Morgan, 1970). This study findings consist of 69% of targeted population where the sample size use is 50

3.5.2 Sample Procedure

For primary data collected for this study, a random selection of quantity surveying firms was made. The sample size for this study is obtained through the number of quantity surveying firms to be contacted for the data. 60 questionnaires were distributed where 57 questionnaires were received out the received

3.6. Methods of Data Collection

The method of data collection that is used for this research work is through hand. This has ensured reliable response from the respondents as they will be able to relate what is not clearly understandable in the questionnaires and to discuss their opinion which was not captured in the questionnaire.

3.6.1 Instrument of Data Collection

The questionnaire as a tool will be used because it is familiar to most people (Berdie, Anderson, and Niebuhr, 1986). Nearly everyone has had some experience completing Questionnaires and it generally does not make people apprehensive. When respondents receive a questionnaire in the mail, they are free to complete it on their own time-table. The questionnaire is a convenient tool especially where there are large numbers of respondents to be handled because it facilitates easy and quick derivation of information within a short time (Kerlinger, 2004).

The structured (closed-ended) is used so as to get the responses from respondents. The closed-ended questions provide a greater uniformity and more easily processed (China and Oteng'i, 2007).

The structured questionnaires are accompanied by a list of all possible alternatives from which respondents select the suitable answer that describes their situation by simply ticking (Mugenda and Mugenda, 2003). The responses are gathered in a standardized way, so questionnaires are more objective. Generally, it is relatively quick to collect information using a questionnaire.

3.7 Validity and Reliability

Validity refers to the degree of accuracy and meaningfulness of inference based on research results. Content validity refers to the degree to which the content of the items reflects the content domain of interest (Miller, 2003). Best and Khan (2005) suggest that the validity of the instrument is asking the right questions framed from the least ambiguous way and based on study objectives. Validity of the data will be done using content-related validity. This will be done by presenting the instrument to the supervisor to evaluate the applicability and appropriateness of the content, clarity and adequacy of construction of the instrument and suggestions made and modified appropriately. This measures the degree to which data collected using a particular instrument represents a specific domain of indicators or content of a particular concept Mugenda and Mugenda

(2003). The indicators of variables were clearly defined and scrutinized and instruments developed to match them.

Reliability of a research tool is realized if it yields consistent information or data after repeat measurements are taken under the same conditions. The tools will be pre-tested (pilot testing) with the respondents from selected contractors and quant surveying firms in Lagos and Oyo and the data obtained will not be included in the final analysis. The main purpose of pre-testing the research instrument is to identify any weaknesses and improve them. The pre-test is likely to give an indication of the time required to complete the tool. These respondents will be retested a second time two weeks later and their consistency between the two sets of the score will be computed using Cronbach's alpha coefficient to ascertain if the α obtained is ≥ 0.7 (Nunally, 1998).

3.8 Methods of Data Analysis

The descriptive statistics method is used to analyze the result to determine the direction of study. This includes linker scale, statistical table, percentile, statistical mean, standard deviation etc. These is used because of their simplicity and also to give over view of the analysis.

For the purpose of this project, data obtained from the questionnaire will be analyzed using the simple percentage method for background information of the respondent and the percentiles will be used to analyze the ranking, statistical

package for social science (SPSS) is also used to analyse data. Analyzed data will be presented in frequencies distribution and tabular form.

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS AND DISCUSSION

4.1 Introduction

This section provides the presentation and analysis of the data collected from the administered questionnaires. It explains the analysis of the data and interpretation of the results obtained from the analysis. A total of sixty (60) questionnaires were sent out to be administered of which fifty-seven (57) were recovered six (6) were void one (1) was nullified as result of non-reliability where by fifty (50) were used for the analysis. The data was analyzed with the use of statistical instruments. Descriptive and inferential analyses were carried out on the data. Percentages and frequencies were used in the descriptive analysis. The data collected from the survey conducted was presented in tables and charts.

4.2 Data Presentation and Analysis

A self-administered questionnaire survey was administered to the quantity surveying firms in Nigeria. A total of sixty (60) questionnaires were administered to the registered quantity surveying firms operating majorly in Lagos state and Oyo state which is located in the south western part of Nigeria. Fifty-seven (57) questionnaires were recovered and fifty (50) were thereby used for this analysis.

The questionnaire contained information on the background information of the firms of the respondents, types of web-based technology used for project monitoring, level of use of web-based technology for project monitoring, the

effect of web-based technology for project monitoring and factor affecting the use of web-based technology by quantity surveying firms. These pieces of information proved very useful in the discussion of finding.

4.2.1 General Information

Firms' years of establishment

The respondent response in this section shows a higher percentage of 44.0% for firms which had been establish in the range of ten to six (6-10years) ago, followed by firms establish in the range of fifteen to eleven (11-15)years ago the which is 22.0%, the firms establish five (5)years ago and below is 20.0%, whereas the firms establish in twenty to sixteen 16-20years ago has a percentage low with 10% of the treated questionnaire and lastly firms establish in more than twenty (20) years ago has the least percentage with 4.0%. This result shows that firms establish in the year ranging from ten to six years ago dominate the sample frame the years of establishment is enough to determine participation in project monitoring. Therefore, the data is quality for this research

Table 1 ***Respondent's year of establishing firm***

	Frequency	Percent
below 5 years	**10**	**20.0**
6-10 years	**22**	**44.0**
11-15 years	**11**	**22.0**
16-20 years	**5**	**10.0**
more than 20 years	**2**	**4.0**
Total	**50**	**100.0**

(Source Field Survey 2019)

Number of Staff in Firm

From Table 4.2, 50% of the respondents have the range of eleven(11) to twenty five (25) staffs in their firms while 18% of the respondent have less than five staffs in their firms 16% of the respondent have within the range of twenty six(26) to thirty nine(39) 12% of the respondent have fifty staffs and above in their firms and 4% of the respondent have in the range of forty to forty-nine staffs in their firms which is the least which means that the highest percentage which is the range of eleven to twenty five staffs is enough to feed us information about the working personnel and management provision which helps in this research

Table.2 ***Respondent's number of staffs in firm***

	Frequency	Percent
less than 10	**9**	**18.0**
11-25	**25**	**50.0**
26-39	**8**	**16.0**
40-49	**2**	**4.0**
50 and above	**6**	**12.0**
Total	**50**	**100.0**

(Source Field Survey 2019)

Professional Qualification

Table 3 respondent's professional qualification

	Frequency	Percent
Fellow	**21**	**420**
Member	**26**	**52.0**
Probational member	**3**	**6.0**
Total	**50**	**100.0**

(Source Field Survey 2019)

From **Table 3**, 52% of the respondents are members such as (MNIQS) of their professional bodies and a total of 42% are fellows such as (FNIQS)while probationer members are 6%. This implies that the professional qualification is indication that the professionals are registered and experienced which shows the reliability and validity of this questionnaire

Types of Organization Sector

The distribution of data collection by respondent's service or organization in the construction industry shows that there was wider coverage in capturing respondent's views and opinions. The response shows Contracting Private Organization as 38%, and Consulting Private Organization 60.%. This also indicate that consulting firms are the major participant which is good for this work.

Table 4 ***Respondent's type of organization sector***

	Frequency	Percent
contracting private organization	**19**	**38.0**
consulting private organization	**30**	**60.0**
public organization	**1**	**2.0**
Total	**50**	**100.**

(Source Field Survey 2019)

4.3 Types of web-based technology use for project monitoring

This section of work deals with the types of web base technology available and the findings indicate the respondent awareness of the availability of types of web based technology use for project monitoring from this study five (5)scale Linkert testing method which are **1 "not at all aware" 2 "slightly aware" 3 "somewhat aware" 4 "moderately aware" 5 "extremely aware".** This determine available web-based technology use that is available for project monitoring were examine which are WhatsApp application Workflowmax software package Buildtools software procure software and Google electronic Mail.

Table 5 ***Types of web-based technology use for project monitoring***

	1	*2*	*3*	*4*	*5*	*Mean*
WhatsApp				**18**	**32**	**4.64**
Workflowmax	**.**	**20**	**23**	**7**		**2.74**
Buildtools	**14**	**4**	**2**	**15**	**15**	**3.26**
Procore	**.**	**17**	**23**	**8**	**2**	**2.90**
Google electronic mail				**32**	**18**	**4.36**
Total	**14**	**41**	**48**	**80**	**67**	

(Source Field Survey 2019)

Therefore, in the survey 64% of respondent claim to be extremely aware and 32% to be moderately aware of WhatsApp as tool use for project monitoring and a mean high of 4.64 likewise google electronic mail constituting of 36% of respondent claim to be extremely aware and 64% to be moderately aware also with mean at 4.36. but Workflowmax and Procore software have varied level of awareness as 40%, 46% and 14% of the respondent is slightly aware somewhat aware and moderately aware respectively and mean at 2.74 For procure while 34%,46%,16%and 4% of respondent is slightly aware, somewhat aware moderately aware and extremely aware respectively mean at 2.90 where by 14% claim not to be aware of Buildtools while 8%and 4% of respondent claim to be aware slightly and somewhat 30% of respondent claim to be moderately and extremely aware each at mean 3.26 this finding indicated that quantity surveying firms are aware of WhatsApp and google electronic mail (which generally known

web-based instrument) and build tools which is much more known more than the likes of Workflowmax and Procore which are specially made web based software that have 45% of respondent awareness

4.2.2 Level of Adoption of Web Base for Project Monitoring by Quantity Surveying Firms

In this part of work the test of adoption of web-based technology for project monitoring was determine using A five-point Likert scale was provided ranging from 1 to 5 where: **1 “never use”, 2 “almost never”, 3 “occasionally” 4 “almost every time ”5 “frequently”** opinion.

Table 6 ***respondent level of adoption of web-based technology for project monitoring***

	1	2	3	4	5	Mean	Std. Deviation
Does web-based technology use for project monitoring at all?	**13**	**20**	**10**	**5**	**2**	**2.86**	**1.309**
Does any part of any project monitoring is carried out by web-based technology		**19**	**19**	**5**	**7**	**3.56**	**.861**
Does web-based use in making progress report of the project	**1**	**24**	**8**	**1**	**16**	**4.06**	**.867**
Are web-based technologies use in capturing activities in project monitoring	**4**	**10**	**13**	**18**	**5**	**2.88**	**1.136**
Web based technologies utilize for forecasting and outcomes		**8**	**23**	**17**	**2**	**2.90**	**.814**
Does web-based technology use as alternative to site meetings				**32**	**18**	**4.36**	**.485**
Are valuation activities done with web-based technologies	**13**	**20**	**10**	**5**	**2**	**2.86**	**1.309**
does web - based use corrective tools for monitoring		**5**	**19**	**19**	**7**	**3.56**	**.861**
Application of web based virtually use in different types of project		**19**	**19**	**2**	**7**	**3.56**	**.861**
Total	**32**	**110**	**101**	**84**	**64**		

(Source Field Survey 2019)

In the finding the respondent accepted to have been using web based as alternative to site meetings as 64% of respondent uses it almost every time and 36% uses it frequently with mean at 4.36. the respondent level of use change slightly in the uses of web based technology for making progress report with 2% of respondent believe to have never use and almost use while 16% of respondent claim to occasionally use and 48% and 32% of respondent claim to use almost every time and frequently respectively and mean at 4.06 but varied claim discovered in the adoption of project monitoring each 26% of respondent have never use web based for project monitoring while 10% agree to have almost use 20% believe they use occasionally while 40% percent claim to almost use every time just only 4% claimed to be using frequently with mean at 2.86 same as adopting it as corrective tools for project monitoring while the use of web based for part of project monitoring, the use as corrective tools in project monitoring and web based using all types of project have 10%,38%,38% and 14% of respondent on almost use, occasionally use almost every times and frequently use respectively at mean 3.56. more over web based technology utility for forecasting is claimed to be (34% of almost never use ,46% of occasionally and almost every time each, and 4%of frequently use) lastly 5% of respondent believe to have never use web based technology for capturing activities in project while 36% of

respondent believe to almost never use 26% believe to use occasionally 20% believe to almost use every time and 10% claimed to frequently use

Therefore, this findings shows that web based technology is greatly adopted by Nigerian quantity surveyors as an alternative to site meeting in monitoring it indicate that web based technology are also used as corrective tools, in any part of project monitoring and all types of project while the findings show varying outcomes in the adoption of web based for project monitoring at all and valuation in project monitoring the adoption in forecasting and capturing activities are also varies in level of use

4.2.3 The Effect of Web Base Technology on Project Monitoring

Respondents were requested to indicate base on their perceived level of these factors on use of web-based technology. A five-point Likert scale was provided ranging from 1 to 5 where: **1 "Strongly Disagree", 2 "Disagree", 3 "Neither Agree nor Disagree" 4 "Agree" and scale 5 "Strongly Agree".** From the responses, descriptive measures of central dispersion; Mean and Standard deviation were used for the interpretation

This survey shows that 64% of respondent in the sample sagree and 34% strongly agree on the fact that project monitoring accuracies and success is as result of web based technology at mean 4.36 more so for the fact that web based technology encourage the personnel and affect performance of project monitoring the respondent opined as 10% disagree 38% undecided while 38% agree 14%

strongly agree at mean 3.56 whereas respondent vies also vary on fact that web based technology influence time frame of the project where 34% disagree 46% is undecided 16% agree and 4 strongly agree at mean 2.90 the effect of web based in achieving the pre determine goal is (8% strongly disagree 36% disagree 26% of neutrals 20% of agree 10% of strongly agree mean at 2.88) while effect of web based technology in project monitoring efficiency and risk identification is viewed by respondent differently with 26% of the respondent strongly disagree 10% disagree 20%undecided 40% agree and 4%strongly agree at mean 2.86.

Thus, the findings indicated that web-based technology has a great effect on project monitoring accuracy and success therefore this finding shows that web-based technology is beneficial to the quantity surveying firms carried out by quantity surveying firms in Nigeria

Table 7 ***respondent table on effect of web-based technology on project monitoring***

	1	2	3	4	5	Mean	Std. Deviation
Web based helps in achieving the pre determine monitoring goal	**4**	**18**	**13**	**10**	**5**	**2.88**	**1.136**
does influence the time frame of project monitoring		**17**	**23**	**8**	**2**	**2.90**	**.814**
Web based technology affect project monitoring success				**32**	**18**	**4.36**	**.485**
Web based technology makes project monitoring efficient	**13**	**5**	**10**	**20**	**22**	**2.86**	**1.309**
Web based encourage perssonel of project monitoring		**5**	**19**	**19**	**7**	**3.56**	**.861**
Web based affect performance of project monitoring		**5**	**19**	**19**	**7**	**3.56**	**.861**
Does allow project monitoring accurate measure				**32**	**18**	**4.36**	**.485**
Web based identify risk associated to project	**13**	**5**	**10**	**20**	**22**	**2.86**	**1.309**

monitoring	
Total	

(Source Field Survey 2019)

4.2.3 Factors Affecting the Use of Web Base Technology for Project Monitoring

From the review, eighteen (18) factors were identified as factors affecting the use of web-based monitoring. These factors are grouped into four (4) which are operational factors, management attitude profit factors and external factors. Respondents were requested to indicate base on their perceived level of these factors on use of web-based technology. A five-point Likert scale was provided ranging from 1 to 5 where: **1** "Strongly Disagree", **2** "Disagree", **3** "Neither Agree nor Disagree" **4** "Agree" and scale **5** "Strongly Agree". From the responses, descriptive measures of central dispersion; Mean and Standard deviation were used for the interpretation

4.2.3.1 operational Factors

This section presents study findings on how the operation of this web-based technology is affecting the use for project monitoring these operational factors consist of the prone of virus attack, the problem of upgrading, incompatibility of

software, proliferation of software, inability of staffs to operate software which are frame work for the operation of the web based

With reference to Table 7 (64.0%) of respondents were of the opinion that the virus attack affects the limited use of web-based technology for project monitoring. With 32% respondents strongly, this had a mean of 4.36. This could be interpreted to mean that the virus attack affects the use of web-based technology for project monitoring. More so The result shows that proliferation of software influences the use of web based technology for project monitoring 60% strongly agree and agree while 28% disagree where by respondent were opined that inability of use by staff and parties is not affecting the use 80% disagree more so in factors of incompatibility of software packages does not really affect the use of web based 40% dis agree 46% are neutral14% agree while problem of upgrading was agree by 44% 36% disagre and 20% are neutral thus

Therefore, it was concluded that operational factors have contribute a little bit more on the use of web-based technology for project monitoring in Nigeria

4.2.3.2Management attitude

This section gives study findings on the lack of awareness of web-based technology for project monitoring by management, management resistance to web-based technology perceive notion of no need of web-based technology fear of encroaching activities and nom available staff that can execute web based for project monitoring and how these variables influence the use of monitoring.

Table 4.8 shows that there is lack of awareness by management has level of agreement to be (44%) disagreement (36%) and neutrals to be 20% and mean of (2.86). on the aspect of management resistance to web based for project monitoring (14%) of respondents strongly agreed, (38%) of respondents agreed, (10%) were disagree (38%) were undecided. The aspect had a mean 3.56. where by the respondent had (32%,48%,16% strongly agree and neutral respectively while 2% each for stongly disagree and disagree with mean of 4.06) of fear of other encroaching activities affect the use of web based for project monitoring and perceived notion of no need to use web base by management is opine in different way where 10% of respondent strongly agree 20% agree 26% were undecided 36% were disagree 8% were strongly dis agree with mean of 3.88 . On the aspect of lack of available staff and parties to execute, (46%) of respondents strongly agreed, (16%) of respondents agreed, (4%) were undecided while 34% were disagree. The aspect had a mean of 4.16. However, the respondents were straight forward on the delay of tenants to report failures in the housing parts (strongly agreed had 14.3%; agree had 30.6%, undecided, 40.8% and disagree had 14.3%).

4.2.3.3 Profit Factors

This section focuses on the study findings on profit factors like poor lack of adequate jobs to encourage the use of web-based technology, high cost of

executing web-based technology, low profit in returns and how these variables influence the use of web-based technology for project monitoring.

Table 8 illustrates that the respondents were of the opinion that lack of adequate job affect use of web based for project monitoring on agreement of (100% and mean of 4.36) with varied views on high cost of executing web based technology level of agreement 46% disagree is 20% strongly disagree 4% and neutral 10% at mean 2.86 (87.7% and mean of 4.08). The respondent's perspective on low profit in returns as facto affecting the use of web-based technology for project monitoring is 38% each on strongly agree and agree 10% neutral and 4% undecided at mean 3.56.

Therefore, it can be summarized that in this group factors no adequate job to compensate profit in incurring web-based profit factors do cause the low use of web-based technology.

4.5.4 External factor

The factor that make up external factors are epileptic power supply, bad network condition lack of awareness by other party involve in project monitoring

Therefore, this finding shows that 10% of respondent disagree 38%undicided among respondent 38% and 14% of the respondent agree and disagree respectively. While the respondent strongly agrees with 64% of total respondent that bad networks affect the use of project monitoring. With 24% agreed and 12%

undecide. only 10% agree the fact that the lack of awareness by other parties involving in project monitoring affect the use of web-based technology (38% undecided 38% agree 14% strongly agree)

The study findings on external factors like bad network, insufficient or epileptic power supply and lack of awareness by other parties involve in project monitoring and how these variables affect the use of web-based technology for project monitoring it was noted that there are changes of political policies through government or local authority.

Table 8 ***factors that affect the use of web-based technology for project monitoring by quantity surveying firms***

Variables	1	2	3	4	5	Mean	Std. Deviation
Does virus attack discourage you from use web base technology for project monitoring				**32**	**18**	**4.36**	**.485**
Does problem of upgrading influence your use of web-based technology for project monitoring	**13**	**5**	**10**	**20**	**2**	**2.86**	**1.309**
Does incompatibility in software packages affect the use		**20**	**23**	**7**		**2.74**	**.694**
Does proliferation of software discourage the use	**14**	**4**	**2**	**15**	**15**	**3.26**	**1.639**
Inability of use by other party involve		**17**	**23**	**8**	**2**	**2.90**	**.814**
Inability to upgrade the application or software				**32**	**18**	**4.36**	**.485**
Does lack of awareness of web-based technology for project monitoring by management affect the use	**2**	**5**	**20**	**10**	**13**	**4.65**	**1.309**

Does resistance to using web based for project monitoring affect		**5**	**19**	**19**	**7**	**3.56**	**.861**
Does the fear of others encroaching quantity surveying jobs discourage the use	**1**	**1**	**8**	**24**	**16**	**4.06**	**.867**
Perceive notion of no need to use web-based technology for project monitoring	**4**	**10**	**13**	**18**	**5**	**2.88**	**1.136**
Lack available personnel to involve		**2**	**8**	**23**	**17**	**2.90**	**.814**
Lack of adequate jobs to encourage the use of web-based technology				**32**	**18**	**4.36**	**.485**
Does high cost of executing web-based technology	**13**	**5**	**10**	**20**	**2**	**2.86**	**1.309**
Does low profit in returns of web base technology for project monitoring limit the use		**5**	**19**	**19**	**7**	**3.56**	**.861**
Does bad network condition discourage the use		**3**	**19**	**19**	**9**	**3.56**	**.861**
Epileptic power supply inhibits the use			**6**	**12**	**32**	**4.06**	**1.136**
maintenance management cost	**13**	**5**	**10**	**20**	**2**	**2.86**	**1.309**
Does lack of awareness by other parties involve in project monitoring reduce the use		**5**	**19**	**19**	**7**	**3.56**	**.861**

(Source Field Survey 2019)

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusion

This dissertation has asses the adoption of web-based technology for project monitoring by quantity surveying firms where be. From the analysis of the result This research has shown that the awareness of firms on use of web-based technology is high with WhatsApp and google mail having 4.56 mean of awareness

The findings in the research also shows that web-based technology are mostly use as alternative to site meetings in project monitoring by quantity surveying firms in Nigeria this in line with researcher's view but the outcomes of this result shows that web-based technology level of adoption is low for project monitoring among firms in Nigeria generally, though it can vary in other part of the world.

The result in this research also shows that web-based technology is effective in project monitoring success and accuracies which is in accordance to

The research findings show that quantity surveying firms in Nigeria are affected by the factors of virus attack on web-based technology software, lack of adequate project monitoring job to compensate investment, bad networks and poor power supply on the use of web-based technology for project monitoring (according Oladapo 2006) and (Olanrewaju 2018) other factors that affect also are personnel skills on web based

5.2 Recommendations

I recommend that management of the firms should change their attitude towards investment of web based by improving the skill of their staff since it is beneficial in project monitoring for the fact that project monitoring helps in project goals

- Government should help in improving the power stability and quality of network services that can foster a proper project monitoring success and improve the construction industry which can help the economic development the country whereby Nigeria can develop to be tag "developed country" (Irtishad Ahmad, Salman Azhar& Syed m. Ahmed) web-based technology is acknowledged as a potent tool for accelerating socio-economic development and narrowing the gap between developing and developed countries
- There is need for personnel to improve on interface and frame work of web-based software that will be used for project monitoring and critically checked against virus on the exposure to web based and improved on the skilled of web-based technology
- Stake holders in industry should evangelize on use of web based for project monitoring and other activities among firms and participant in industry

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APPENDIX

KWARA STATE POLYTECHNIC, ILORIN
DEPARTMENT OF QUANTITY SURVEYING

Dear respondent,

I Adebayo Olayemi Isaac an undergraduate student of the above name institution here by implore you to be my questionnaire respondent for the final year project dissertation title **The Adoption Of Web Based Technology For Project Monitoring By Quantity Surveying Firms In Nigeria** this questionnaire is design to obtain your valued opinion Kindly know that while fully abiding by matters of research ethics, I assure you that any information supplied will be treated with utmost confidentiality and used solely for research purpose only.

SECTION A: BACKGROUND INFORMATION

1. Please what is the name of your firm/establishment?

2. What is the location of your firm?

3. Please indicate your years of establishment/firm?
   A. below 5 years [ ] B. 6-10 years [ ] C. 11-15 years [ ] D. 16-20 years [ ]
   E. More than 20years [ ]

4. please indicate the numbers of staff available in your firm?
   A. less than 10 [ ] B.11 -25 [ ] C. 25 - 39 [ ] D. 40 - 49 [ ] E. 50 and above [ ]

5. Please tick the appropriate body your firm is register to?
   A. Member [ ] B. Fellow [ ] C. Probationer Member [ ] D. others, please specify

6. Type of your organization/firm sector
   A. Contracting Private Organization [ ] B. Consulting Private Organization [ ] C. Public Organization [ ]

SECTION B: TYPES OF WEB BASED TECHNOLOGIES THAT ARE AVAILABLE FOR PROJECT MONITORING

The following web-based technology were listed available for project monitoring in this research please tick base on your level of awareness on the scale **(5) "extremely aware**" **(4) "moderately aware**" **(3) "somewhat aware" (2) "slightly aware" (1) "not at all aware"**

		5	4	3	2	1
1	WhatsApp					
2	Workflowmax					
3	Buildtools					
4	Procore					
5	Google electronic mail					

SECTION C: LEVEL OF ADOPTION OF THIS WEB BASED FOR PROJECT MONITORING BY QUANTITY SURVEYING FIRMS

This part to examine the rate of adopting web base for project monitoring by quantity surveying firms. so please tick base on your amount of use on the scale {**5} "never use" (4) "almost never" (3) "occasionally" (2) "almost every time" (1) "frequently use**:

		5	**4**	**3**	**2**	**1**
1	Does web-based technology use for project monitoring at all?					
2	Does any part of any project monitoring is carried out by web-based technology					
3	Does web-based use in making progress report of the project					
4	Are web-based technologies use in capturing activities in project monitoring					
5	Web based technologies utilize for forecasting and outcomes					
6	Does web-based technology use as alternative to site meetings					

7	Are valuation activities done with web-based technologies					
8	does web-based use corrective tools for monitoring					
9	Application of web based virtually use in different types of project					

SECTION D: EFFECT OF WEB BASED TECHNOLOGIES ON PROJECT MONITORING

base on your own perceive effect of web-based technology on project monitoring scale of **(5) "Strongly Agree", (4) "Agree", (3) "Undecided", (2) "Disagree", (1) "Strongly Disagree"** and tick (√) to the best of knowledge.

		5	**4**	**3**	**2**	**1**
1	Web based helps in achiving the pre determine monitoring goal					
2	does influence the time frame of project monitoring					
3	Web based technology affect project monitoring success					
4	Web based technology makes project monitoring efficient					
5	Web based encourage personnel of project monitoring					
6	Web based affect performance of project monitoring					
7	Does allow project monitoring accurate measure					
8	Web based identify risk associated to project monitoring					

SECTION E; FACTORS AFFECTING THE USE OF WEB BASED TECHNOLOGY FOR PROJECT MONITORING

1. The following factors were identified base on this research work as the factors the use of web-based technology for project monitoring. Please rank based on your perceived level of importance on the scale of **(5) "Strongly Agree", (4) "Agree", (3) "Undecided", (2) "Disagree", (1) "Strongly Disagree"** and tick (√) to the best of knowledge

		STRONGLY DISAGREE	DIASGREE	UNDECIDED	AGREE	STRONGLY AGREE
OPERATIONAL FACTORS						
1	Does virus attack discourage you from use web base technology for project monitoring					
2	Does problem of upgrading influence your use of web-based technology for project monitoring					
3	Does incompatibility in software packages affect the use					
4	Does proliferation of software discourage the use					
5	Inability of use by other party involve					
6	Inability to upgrade the application or software					
MANAGEMENT ATTITUDE						
7	Does lack of awareness of web-based technology for project monitoring by management affect the use					
8	Does resistance to using web based for project monitoring affect					
9	Does the fear of others encroaching quantity surveying jobs discourage the use					

10	Perceive notion of no need to use web-based technology for project monitoring					
11	Lack available personnel to involve					
PROFIT FACTORS						
12	Lack of adequate jobs to encourage the use of web-based technology					
13	Does high cost of executing web-based technology					
14	Does low profit in returns of web base technology for project monitoring limit the use					
15	Poor budgetary control is a key contributor to increase in maintenance management cost					
EXTERNAL FACTORS						
16	Does bad network condition discourage the use					
17	Does epileptic power supply inhibit the use					
18	Does lack of awareness by other parties involve in project monitoring reduce the use					