

**INFLUENCE OF WEB BASED PROJECT MANAGMENT
SYSTEMS ON ORGANIZATIONAL PERFOMANCE:
A CASE OF NOKIA SOLUTIONS AND NETWORKS KENYA**

BY

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**A Research Project Report Submitted In Partial Fulfilment For The Requirement For
The Award Of The Degree Of Master Of Arts In Project Planning And Management Of
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DECLARATION

The research project is my original work and has not been submitted for a degree or any other award in any other institution.

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The research Project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

The project is dedicated to my wonderful and loving husband, Eric Mulati for his constant support, love and encouragement and to my parents, Ben Muema and Margaret Nzioka and sister, Mbithe Muema who have encouraged me on every step of the way as I pursue my studies.

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To my employer, Nokia Solutions and Networks for opening my eyes to the power posed by Web based Project Management Systems (WPMS)

ABSTRACT

The Project Management paradigm has grown over the years, largely because of the collaborative nature of projects and the growth in IT and internet usage. The use of Web based project management systems (WPMS) is an advancement in the rolling out of projects. A Web-based Project Management Systems is a systems that is available online (in the World Wide Web) that is used as a Project Management aide. These systems are used at the very least as a project repository but can have more functions depending on the nature of system. They are always available online and can be accessed from any sphere of the world. These systems are deployed in order to add value to the project management as well as meet the organizations objectives. However, very little research has been done in Kenya to investigate how these systems tie to an organizations strategy. This project thus sought to investigate the influence that WPMS have on the organizational performance. The study was guided by four research objectives which are: To examine the influence of document management by use of WPMS on organisation performance, to examine the influence of cash flow management by use of WPMS on organisation performance, to assess how access to project reports via WPMS influence organisation performance and to examine the level at which quality management by use of WPMS influence organisation performance. In order to answer these research questions, the study adopted survey research design. This design was considered appropriate for this study because it saves time, expenses and the amount of quality information yielded is valid, while interviewer bias is reduced because participants complete identically worded self-reported measures. The target population was the employees of NSN who use the WPMS; the total numbers of NSN users of the system were 160. Since the employees were many, samples were taken from the different department using stratified random sampling technique. Questionnaires were issued out to the respondents then the data analyzed based on the feedback provided. The study found out that that Web Based Cash flow System influence performance of Nokia Solutions and Networks Kenya as it is a great enabler and improves efficiency, adds value in the invoicing and payment process. The study also established that there was a general consensus among the employees on the fact that Web Based Quality Management Systems influence performance of Nokia Solutions and Networks Kenya as it ensures that the different quality gates hinge on themselves which provides a self-sustaining model and complete project lifecycle. The study further concluded that Web Based Reporting System improves visibility by providing a snapshot and feedback to performance in the company which helps speeding up the communication and as a result there is a fast and accurate project controlling. The study finally recommends that Nokia Solutions and Networks Kenya should move from the platform where the appending of signatures is done on hard copy which brings about delays in the approval process as the person in charge must be there physically whereas in a Web Based Document Management Systems this can be done remotely.

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LIST OF ABBREVIATIONS AND ACRONYMS

EPM	Electronic Project Management.
ICT	Information Communication Technology
NSN	Nokia Solutions and Networks
PM	Project Management
PMO	Project Management Office
WPMS	Web based Project Management System

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Project management can be defined as the application of knowledge, skills, tools and techniques to project activities to meet project requirements. Project management is accomplished through the application and integration of the project management processes of initiating, planning, executing, monitoring and controlling, and closing.

Project management is essentially about managing a project from an idea through to completion (Peters, 2005) and it needs to be discussed in terms of various stages of a project life cycle. A project could be viewed as a system, which is dynamic and ever changing from one stage to another in a life cycle. Considering a generic project, its status changes from that of an idea or a concept through to feasibility studies, execution and finally completion. (Peters, 2005). But projects today are far more complicated than ever before, this is because of rapid changes caused by business globalization and information technology advances which support distributed and virtual project teams.

Traditional Project Management focuses on a single project at a single location and is more concerned with project inputs and outputs rather than with the project work itself. Traditional PM emphasizes scheduling, planning and tracking. The PM paradigm has begun to shift due to the increasing number of distributed projects involving team members from different sites, organizations, and cultures.

The changes in business processes and project implementation has encouraged management scientist to come up with creative ways of managing projects. Some of the methodologies created are the work breakdown structure (WBS) technique which was introduced to aid project planning and project cost management (Meredith & Mantel, 2006). The critical path method (CPM) and the program evaluation and review technique (PERT) were developed to aid project scheduling and risk analysis. The Gantt chart was exploited to improve project control and monitoring (Wysocki, Beck, & Crane, 2000). The earned value method (EVM) has been used to integrate project scope management, cost management and time management, and to forecast project cost and schedule at completion (Anbari, 2003).

The changing nature of projects as highlighted above and the growth of the Internet has definitely had an impact on Project Management in that now projects are more and more utilizing the power of the internet and technology to manage the outputs. Alshawi and Ingirige(2003) puts it this way: “These days, projects are generally far more complicated involving large capital investments, combining several disciplines, project members who are widely dispersed, tighter schedules, and rigorous quality standards. These factors together with the rapid developments in Information and Communication Technology (ICT) have offered project management practitioners the opportunity to take advantage of newly developed management tools and the latest technology, such as Web-based project management systems (WPMSs)” (Alshawi & Ingirige, 2003).

According to Helbrough,(1995) One of the major changes in Project Management, over the last 25 years, has been the use of computerized tools and methods.

They involve larger capital investments, embraces several disciplines, widely dispersed project participants, tighter schedules and stringent quality standards . These factors coupled with high speed developments in Information and Communication Technology (ICT) have influenced project management practices to take a new turn taking advantage of newly developed management tools and the latest technology. This has led to the development and use of systems that allow for effecient managing of projects. These systems are broadly referred to as Integrated Project Management Systems, Electronic Project Management(EPM) ,collaborative systems or Web-based Project Management Systems (WPMS).

A Web-based Project Management Systems as the name suggests is a systems that is available online (in the World Wide Web) that is used as a Project Management aide.

These systems are used at the very least as a project repository but can have more functions depending on the nature of system. They are always available online and can be accessed from any sphere of the world. Basically, these systems provide a centralized, commonly accessible means of transmitting and storing project information. Project information is stored in a server and a standard web browser is used as an access point to exchange this information, eliminating geographic and boundary hardware platform differences (Matheu, 2005).

O'Brien states that "WPMSs provide project participants with the same information in a reliable and easily retrievable method, in theory, improving communication and leading to improved projects".(O'Brien, 2000).

So in effect these systems go a long way in improving communication within the project stakeholders.

These Web-based Project Management Systems can have the features customized to address the needs of an organizational. Some of the common features in Web-based Project Management Systems are documentation uploads and retrieval, documentation approval, project schedule update and report generation. Other feature that may be offered by Web-based Project Management Systems are cost estimation, automated process aligned to the business, resource management, allocation of tasks to resources, timesheet to capture time details of task execution, reporting, and management visibility.

These Web-based Project Management Systems relies on an Integrated Project Team made up of the complete range of stake holders. Project teams can also rigorously analyze data and trends across portfolios, programs, and projects to optimize "lessons learned" and value-engineering opportunities. The bottom line is that these systems provides insight rather than hindsight on both project and stake holder levels. It allows for the avoidance of crisis management by supporting forward thinking communications between stake holders and by supplying accurate, timely, and consistent data at multiple levels for every stake holder.

Having established the purpose and advantages of using Web-Based Project Management Systems, it now becomes obvious that it can be applicable in the telecommunication sector as with any industry that seeks development in this current day. The telecoms industry in Kenya, just like the rest of the world, is going through profound changes. In the past decade, technological advancement and regulatory restructuring have transformed the industry. Markets that were formerly distinct, discrete and vertical have coalesced across their old boundaries with a massive investment of capital - much of it originating from private sector participants.

In the resent past we have seen a number of changes in the Kenyan telecom industry resulting in new markets, new players, and new challenges. Market liberalisation efforts have also picked up ensuing the successful partial privatisation of Telkom Kenya Ltd (December

2007), divestment of GoK's 25% stake in Safaricom Ltd through a public listing (May 2008), and the launch of fourth mobile operator Econet Wireless Kenya (November 2008). This has resulted into some of the world's best known telecommunication providers – Vodafone, France Telecoms and Essar Communications through their investments in Safaricom Limited, Telkom Kenya Limited and Econet Limited respectively - being major players in the Kenyan market. Ongoing infrastructural developments by operators have largely been focused on network expansion for increased nationwide coverage (<http://www.cck.go.ke/>).

Introduction of 3G services by most of the telecom operators and allowance of number portability is playing an important role in propelling the growth of Kenya's telecommunication. In addition to this, with rapidly improving mobile infrastructure and intensifying competition among mobile operators, the number of mobile subscribers in the country is on the rise.

Supported by the future-looking vision of the government, Kenya is on the verge of becoming one of the fastest growing Internet/broadband markets in the continent. Most of the work in the telecom industry is project based with the rollout of technology within a certain time frame and budgetary allocations. The Project Management discipline is thus a key subject matter to investigate in this industry. To investigate automation in Project delivery is value add to the industry as it show the significance and use of Web-based Project Management Systems and how these systems can improve performance in project roll out. It is inherent that the Kenyan telecommunication sector is in need of Web-based Project Management Systems, if they have not already adopted. It is therefore necessary for this project to establish how the WPMS assist organisations to achieve their objectives and increase performance.

1.2 Statement of the problem

Previous studies have shown that the use of Web-based Project Management Systems is more efficient and advantageous to the present project management approaches. However, inadequate literature exists on the implementation of Web-based Project Management Systems in the Kenyan Market.

One of the telecom vendors, Nokia Solutions and Networks (Kenya) Ltd uses an in house project management system in rolling out the networks for Mobile operators. This research

would want to find out how the WPMS has assisted NSN to improve performance both in project deployment and business as usual activities.

NSN went through a phase of company restructuring from early 2011 to early 2013. The aim of the restructuring was to improve productivity and efficiency. “These planned measures of restructuring and laying off of some personnel are expected to include elimination of the company’s matrix organizational structure, site consolidation, transfer of activities to global delivery centres, consolidation of certain central functions, cost synergies from the integration of Motorola’s wireless assets, efficiencies in service operations, and company-wide process simplification.” www.nsn.com

The project thus sought to find out whether the WPMS facilitated in the realization of the restructuring goals. In effect is NSN able to improve performance?

1.3 Purpose of the study

This study sought to investigate the influence that WPMS has on organizational performance.

1.4 Objectives of the study

- a) To examine the influence of cash flow management by use of WPMS on organisation performance.
- b) To examine the influence of quality management by use of WPMS influence organisation performance.
- c) To assess how access to project reports via WPMS influence organisation performance.
- d) To examine the influence of document management by use of WPMS on organisation performance.

1.5 Research questions

- a) How does cash flow management by use of WPMS influence organisation performance?
- b) How does quality management by use of WPMS influence organisation performance?
- c) How does project reporting via WPMS influence organisation performance?

- d) To what extent does document management by use of WPMS influence organisation performance?

1.6 Significance of the study

The study sought to provide an understanding of the influence of web based project management software on organizational performance; the findings will assist future researchers in carrying out further studies in this field. The findings of this research will also act as a case for organizations adapting WPMS to improve organizational performance.

1.7 Delimitation of the study

This study targeted the telecommunication companies in Kenya specifically Nokia Solutions and Networks (NSN). The study particularly focused on the delivery of site based rollout projects.

1.8 Limitations of the study

There are a number of factors affecting WPMS on organisation performance, but because of time constraints and the scope of the project, the researcher was not able to cover all of them. The researcher would appeal to corporate entities, Marketers and Retailers to conduct a more extensive research, taking into consideration more factors and covering all the major companies in the Republic.

Financial limitations and time constraints was a major limitation when conducting this study. The ideal case for such a study is to conduct it in a number of similar companies. The results of this study may lack generalization to other industries that use WPMS as a project aide.

1.9 Assumptions of the study

It was assumed that the telecommunication companies that the research was carried out allowed access to relevant information towards the study and that the respondents were truthful and dependable.

It was also assumed that the sample respondents were a true representation of the total sample.

1.10 Definition of significant terms

Cash Flow Systems: This refers to a system within the web based project management system that is responsible for managing invoicing and payment process.

Document Management Systems: This refers to a system within the web based project management system that is responsible for storage and managing of soft copy documents.

Reporting Systems: This refers to a system within the web based project management system that is responsible for generating reports.

Quality Management Systems: This refers to a system within the web based project management system that is responsible for ensuring that the quality metrics of the project are adhered to.

Web-based Project Management Systems: This refers to use of web based software in the course of managing a project. The software may be used from the simplest to the most complex of activities. Some of the functionalities offered by Web-based Project Management Systems include progress tracking, documentation storage, rollout planning and demand supply planning.

1.11 Organizational of the Study

This study contains five chapters and an appendices section.

Chapter One provides the introduction, the background of the study, statement of the problem, research objectives and questions, significance of the study, basic assumptions and delimitations of the study. The chapter also contains the definition of significant terms used in the study.

Chapter Two discusses the literature on Web based project management systems (WPMS) and the benefits accrued from these systems. The chapter also contains the conceptual framework and is concluded with a summary of reviewed literature.

Chapter Three gives a description of the methodology used for the study. The research design and sampling techniques used are explained. The method of sample selection and determination is explained. The methods of data collection, analysis and presentation are discussed. This section is concluded with the operational definition of variables, which attempts to associate the objectives with the methodology.

Chapter Four contains the presentation to the findings arising from data analysis using the techniques described in chapter three; the chapter will also have the interpretation and discussions of the findings.

Chapter Five will present the summary of the findings, the conclusion and the research recommendations. The chapter will contain a section for suggested areas for further studies arising from the study findings and contributions to the body of knowledge.

The Appendices section contains; the introductory letter to respondents and research questionnaire.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter reviews literature on the Web-based Project Management Systems (WPMS). The potential benefits of deploying the WPMS were explored as well as benefits in line with the research objectives. In addition, the theoretical and conceptual framework for the study was also examined in this chapter.

2.2 Concept of Web based project management systems (WPMS)

The penetration of information technologies into project management is more profound and intense than one might imagine. It has a deep history, strong present and promising future. It is manifested in the proliferation of project management software packages and the use of other technologies and solutions such as expert systems, decision support systems, geographic information systems, the Internet and intranet, graphical and design tools, virtual reality, database, cost management systems, and risk management tools. Project-driven organizationals increasingly adopt IT solutions to help them deliver high-quality products and services within a short time with lower cost (Meredith & Mantel, 2006).

Project management software was initially developed in the 1960s and 1970s to run on large computers. More than 500 project management software packages were developed in the 1990s, with a wide variety of prices and capabilities (Meredith & Mantel, 2006). Project management software tools are evolving at a fast pace, from personal computers (low-end systems), which support a limited number of features such as project scheduling and cost management, to the client-server and Web-enabled (high-end systems) with new collaboration and communication capabilities. The high-end tools take advantage of the Internet and allow organizationals to manage concurrent projects in different locations with high resource and equipment control and coordination. Project systems are moving away from isolated islands of information (low-end software) toward integrated data across projects with automated processes that allow multiple users to view and update project data remotely without time and space limitations (Lawton, 2000).

A Web based Project Management System (WPMS) is an electronic project management tool conducted through the 'Extranet', which is a private network that uses Internet protocols to

transmit information. They are designed to store and manage project information. Basically, these systems provide a centralised, commonly accessible means of transmitting and storing project information. Project information is stored in a server and a standard web browser is used as an access point to exchange this information, eliminating geographic and boundary hardware platform differences (Matheu, 2005).

These systems offer a level of access to project information that exceeds traditional means of communication such as telephone, fax, traditional post, and email, and storage mechanisms such as project binders for hardcopies. WPMSs provide project participants with the same information in a reliable and easily retrievable method, in theory, improving communication and leading to improved projects (O'Brien, 2000).

Many authors believe that WPMSs improve overall coordination, collaboration, and communication on projects in a variety of ways. Cox (2007) comments that, "No other technology provides interaction, communication, collaboration, archival data, a project-information continuum, participant reliability, and accountability".

Cox (2007) also suggests that WPMS technology is, "placed to make the largest impact on project delivery since the introduction of the person computer", which is a bold statement.

Below these are the services that a WBPMS provides (Matheu, 2005):
Document Management: Management of file formats, uploading/downloading tasks, search functions, backup facilities, tracking history of files' actions;
Team Communication: real time discussion between groups, project calendar and event planning, team communication and
Business Process Automation: browser compatibility, plotting, server located in a secure data centre, system authentication, virus protection

These systems have become so popular because of the insurmountable benefits that they provide. Becerik and Pollalis (2006) have categorized the benefits in terms of tangible, quasi-tangible, and intangible benefits. The definitions of the different benefits are: **Tangible benefits:** these are the benefits that are quantifiable and measurable in monetary terms; **Quasi-tangible benefits:** these are benefits that are quantifiable but difficult to measure e.g. improved data availability, faster reporting and feedback and **Intangible benefits:** These are

benefits that are neither quantifiable nor easy to measure for example improving the efficiency and performance of the organizational.

These systems can be classified into various subsystems depending on the function performed by the subsystem. These subsystems are: Cash Flow Systems: This refers to a system within the web based project management system that is responsible for managing invoicing and payment process, Document Management Systems: This refers to a system within the web based project management system that is responsible for storage and managing of soft copy documents, Reporting Systems: This refers to a system within the web based project management system that is responsible for generating reports and Quality Management Systems: This refers to a system within the web based project management system that is responsible for ensuring that the quality metrics of the project are adhered to.

2.3 Cash Flow System and Organizational Performance

Cost management is a vital part of ensuring a business remains efficient, profitable, and ultimately successful. When exploring the world of cost management software programs and applications, it is important to look at a variety of attributes, including price, ease of use, and suitability for the size of the business. Some cost management applications focus on cost at the project level; in fact, there are WPMS that include a measure of cost management functionality. Other software solutions place emphasis on managing the expenses of the business as a whole, instead of on a project basis. Expenses can be tracked more accurately with WPMS. For example invoices can be uploaded and electronic approvals done in the system. Automation is key to cost savings. A WPMS can have a feature to manage the costs of the project, at a very basic level to view the project costs to a high level of automating the cash flow of the project. (Matheu, 2005)

Printing, postage and document administration costs are reduced as all documents are stored centrally (Matheu, 2005). Alshawi & Ingirige (2003) add that visits to site and travelling time can also be reduced as the most up-to-date progress photographs are constantly accessible for viewing on the system. Due to the complete audit trail it provides, WPMSs also reduce time and money spent on disputes (Alshawi & Ingirige, 2003). Cox (2007) concurs, stating that

WPMS, “reduce the costs incurred by change change orders, claims, and record maintenance, as well as minimise or eliminate delays”.

2.4 Quality Management System and Organizational Performance

Organizations in highly regulated industries continue to face pressure to maintain the highest level of quality control in every facet of their operations, while at the same time reducing costs and maintaining margins. An investment in a quality management system can help achieve both needs: superior quality and reduced costs.

The quality management systems have progressed gradually from a deployment of tactical point solutions to complete enterprise-level solution offerings. These integrated quality management systems now provide dramatic benefits across broad functional areas for many organizations, enabling them to implement automated, highly interactive quality control processes tailored to align with each organization’s specific products and business practices. The efficiency and effectiveness of these holistic quality management systems are improved through interactive integration with other existing enterprise-level quality management software. Cox (2007)

Quality Management systems within the Web based Project Management systems are systems that optimizes quality, ensures compliance and reduces costs and risk within the project. These systems can offer the flexibility and configurability to adapt to company-specific business processes and enabling the project team to access the project quality indicators via the WPMS. Alshawi & Ingirige (2003)

A well structured quality management system is capable of performing the following tasks: Manage all quality control processes in a centralized database, enable site level, process level and role-based security, streamline workflow processes, leverage powerful status reports and metrics and configure workflow quality systems management tools. Alshawi & Ingirige (2003)

2.5 Reporting System and Organizational Performance

Project status reporting is one element of the project controlling process and project governance. Its purpose is to ensure that the objectives of the project are being met by monitoring and measuring progress regularly to determine variances from the plan. When variances are identified, then corrective action can be taken.

There are a number of benefits of regular status reporting. A few of the more significant benefits are: It provides an opportunity to raise issues or variances from the plan and to take corrective action before a situation gets beyond recovery. It is possible that a situation cannot be recovered. However, at a minimum, the situation is identified and it does get reviewed; secondly it helps to create accountability for the work being done. This happens because it makes the work more visible to all of the project stakeholders (i.e. project team members, Project Manager, Project Sponsor, and Senior Management) and lastly it creates a visible record of the progress of the project. The Project Manager or Senior Management can review this record should some of the history be needed. Regular status reporting is necessary in order to be effective. It helps to maintain traction and visibility for the project. The frequency of reporting is often a function of the duration of a project and its importance to an organizational. For projects with a short duration (i.e. less than six months), it is better to have weekly reporting so that issues are raised and dealt with sooner. For projects with a longer duration, bi-weekly or monthly reporting may be more suitable or desirable. (Matheu, 2005).

Becerik and Pollalis (2006) suggest project teams can manage complex programs with less administration staff and can communicate with greater effectiveness when using a WPMS. In contrast to this, O'Brien (2000) argues that it should be recognised that these systems are "not necessarily labour-saving devices for all individuals on a project team". Ilich, Becerik, and Aultman (2006) suggest that WPMSs increase the speed of communication on a project which is corroborated by Alshawi & Ingirige (2003) who comment that such systems improve efficiency

through "speedy and accurate information between head office and sites". The study by Matheu (2005) also suggests WPMSs create a reduction of the response time for RFIs (Requests for Information), COs (change Orders) and specifications clarification. Nitithamyong & Skibniewski's (2007) study ranks "enabling immediate report and feedback" 5th from all WPMS benefits.

Matheu (2005) suggests that WPMSs improve project communication, align business processes increasing transparency as barriers to communication are removed. Collaborative systems reduce the amount of re-work by storing not just information but the knowledge that derived it.

A study conducted by Nitithamyong & Skibniewski (2007) concurs with Matheu's statement, finding that, "enhancing coordination among team members" is 3rd in the rankings of the benefits of WPMS. Alshawi & Ingirige (2003) add that by using a WPMS, the speed of communication increased, resulting in shorter lead-times for tasks. Alshawi & Ingirige (2003) also comment that such systems result in accuracy of communication which transpires into fewer errors and rework costs.

With faster, more complete information flows comes faster decision making. The web-based software also increases awareness meaning "project managers can easily realise any changes that would affect a project" (Becerik and Pollalis, 2006). Alshawi & Ingirige (2003) also acknowledge "Better management and decision-making" as a benefit of WPMS implementation. This benefit is realized by having a snap shot of the project, which is realized by examining the project reports.

From the above discussion, it is clear that the reporting system provides timely information towards the project and improves on the project communication within the stakeholders.

2.6 Document Management System and Organizational Performance

Central to the document management advantage is access to information. With the increasing volume of business documentation, the need to find the right information at the right time becomes more and more critical. Electronic document management solutions deliver information more quickly and with more precision than traditional filing systems and at a much lower cost. The document management system provides for electronic data management. Matheu (2005)

These two major benefits of electronic data management is saving time and reducing costs which speak directly to the mission of most organizations. Yet there are several other motivations for companies to deploy a document management solution. Many seek out more effective document control because it addresses a critical business issue. A digital document management system can provide an effective solution to several common problems, such as: paper and electronic records spread among geographically dispersed locations, security

breaches of paper documents or electronic files, inconsistent processes resulting in cluttered folders, misplaced files, or confusion between versions, overwritten revisions on documents generated by several collaborators and lags or bottlenecks in procedural workflow.

Looking for an item in a file cabinet and not finding it happens quite a bit. In fact, employees spend one-fifth of their day looking for hard copies, and in only 50% of the cases do they find the information in the expected place. Labor expended for file hunting is by far the biggest expense related to paper record systems. In some cases, employees never find the document in question at all, and the staff has to repeat the work to produce it again, adding to the drain on resources. One witnesses similar slowdowns with digital files when they reside in the traditional PC-folder structure in the absence of a document management framework. As employees create new folders in ad hoc fashion, files become increasingly disorganized. Over time, digital content is saved on different servers and workstations, in different folders, under different names. Much like paper systems, employees go to look for the most current version of the file, but have to check multiple possible locations.

A document management system typically indexes each item with a specific keyword, keeping all data content searchable company wide. Employees can bring up the right document in seconds without rifling through drawers. Digital document management significantly reduces the time for routine file search and retrieval while largely eliminating the interruptions in work caused by misplaced information. Companies with document management systems find quicker project completion and faster and more accurate response to information requests. Saving time and reducing budget outlays do not make up the full business value of the document management advantage. By removing the wasted labor associated with old filing methods, employees can execute more projects (increasing productivity) and spend more time and attention to client needs (increasing customer satisfaction). Opening up office area formerly devoted to file storage enables a business to expand without having to lease a larger space. Therefore, the value of a document management system is more than just lower overhead; there is typically an amplification of business performance across the board. (Nitithamyong & Skibniewski's, 2007)

Assistance in searching for files and documents is ranked 4th in Nitithamyong & Skibniewski's (2007) study of WPMSs success factors, which corroborates the above findings. Cox (2007) also corroborates with the above commenting that, "by having a central

portal of the most up-to date project information for all participants provides the opportunity to access whatever is needed to perform individual project responsibilities”. Cox (2007) also comments that project participants can access archived historical data through these systems which allows the users to understand project issues as they arise and are resolved.

These systems ensure all project information and communication threads have been tracked and stored in a structured and credible way (Becerik and Pollalis, 2006). Cox (2007) views this as a major benefit of using WPMSs, because project participants can easily see which team member/s may be causing any bottlenecks by holding up a decision or essential piece of information. This results in improved accountability of project team members and reduces the likelihood of delays (Cox, 2007).

2.7 Theoretical Framework

Theory and empirical analysis are interrelated and influence each other: theory guides empirical observation and empirical observation improves theory. Over time, the interactions between theory and empirical analysis enhance our understanding of the phenomenon of interest. In scientific research, once the subjects of interest are determined, theory influences the research through the choice of explanatory variables, hypothesis construction, and result interpretation.

Various theories have been explicitly or implicitly applied in research on internet usage and the systems that are used via the internet which included the Web Based Project Management systems(WPMs, including the Theory of Reasoned Action, the Theory of Planned behavior, The Technology Acceptance Model, Transaction Cost Theory and Innovation Diffusion Theory.The researcher considered one theories for the purposes of this study; Technology Acceptance Model(TAM)

2.7.1 Technology Acceptance Model (TAM)

TAM was developed by Fred Davis and Richard Bagozzi. TAM is basically an information system theory that covers how a user accepts and uses a technology. TAM outlines a number of factors that influence a user’s decision and at the same time deals with the how and when users will use it. The model deals with the acceptance of information technology. The external factors that influence users to make a decision are: Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). Perceived Usefulness (PU) is the “the degree to which a person believes that using a

particular system would enhance his or her job performance" and Perceived Ease of Use (PEOU) is the "degree to which a person believes that using a particular system would be free from effort" (Davis et. al., 1989).

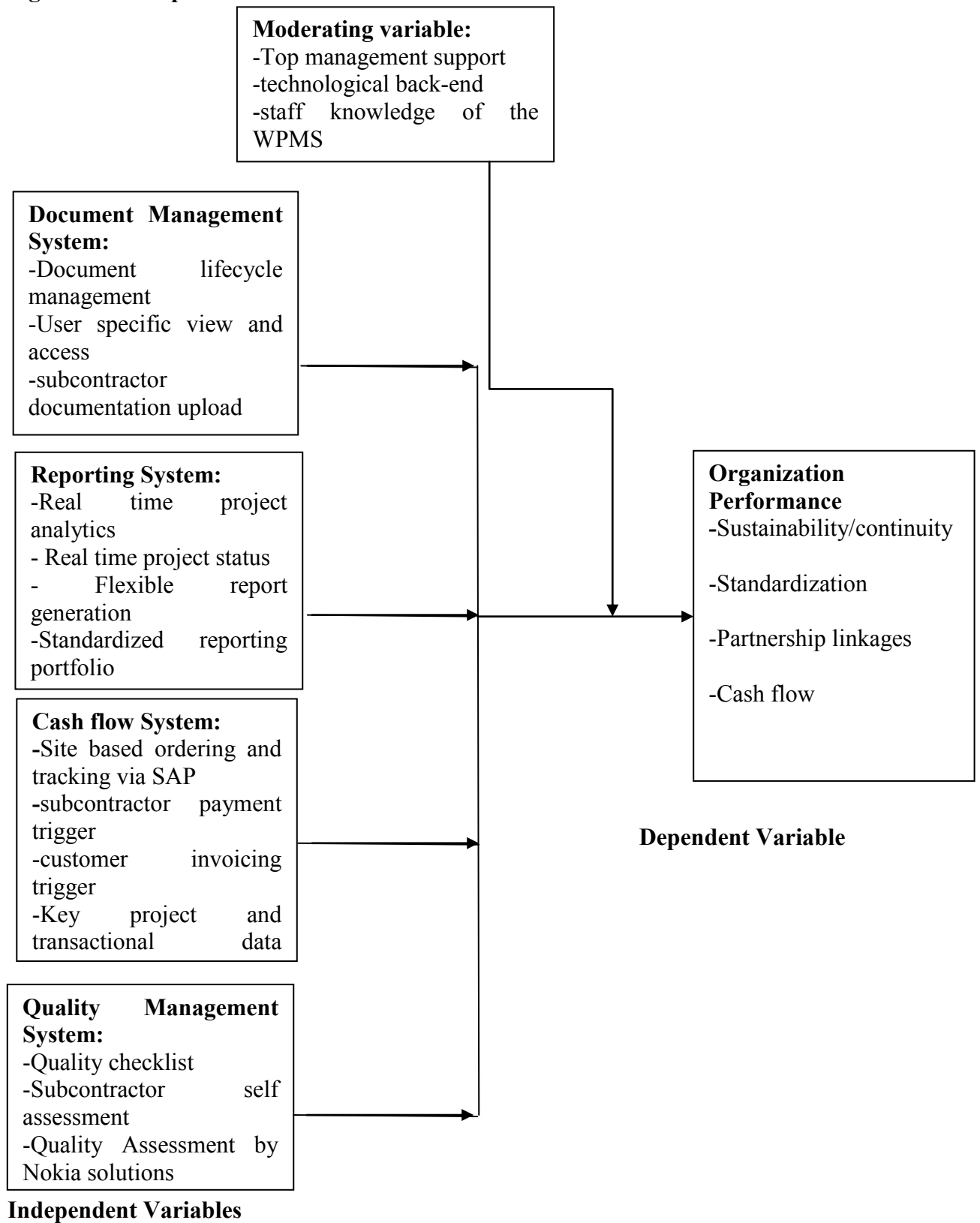
Davis (1989) Technology Acceptance Model (TAM), which is based on the Theory of Reasoned Action, has been widely accepted and applied because it is easy to understand and apply. A large number of studies have supported it over a long period of time and through a wide variety of applications (Nilakanta & Scamell, 1999). Ease of use and usefulness are the major constructs in TAM that measure user intention toward the use of technology. These two constructs are found to persist over a wide variety of studies as powerful measures of user attitude toward using IT (Nilakanta & Scamell, 1999). Researchers, including Davis, recognize other important constructs that have been left out of TAM.

Taylor and Todd (1995) incorporated the Theory of Planned Behaviour into TAM by adding the following explanatory variables: (1) system compatibility with the user work, (2) social influence (peer influence and supervisor influence), (3) user efficiency in operating the system, (4) technical compatibility with other systems or hardware, (5) resource availability, and (6) personal attitude toward the technology (attitude, control, intention), which enhance the power of predicting user intention toward IT usage.

2.8 Conceptual Framework

The conceptual framework of the study is as highlighted below:

Figure 1: Conceptual Framework



From the diagram shown above, the independent variable is WPMS (Web based project management systems).

The dependent variables on the other hand are: standardization, sustainability, partnership linkages and cash flow.

The moderating variables are: Top management support, technological back-end, staff knowledge of the WPMS and organizational culture

2.9 Conclusion and Possible Areas for Further Research

Literature review shows that there is evidence for a case of adoption and deployment of WPMS in today's projects. There are benefits to the individual employees and this spill to the organizations itself to achieving its overall objectives. However, there is little evidence of research on WPMs in the local market and as such the study proved information on the WPMS and how these systems aide in achieving an organizations strategy and improve performance undertaking a case study approach of an international firm which is locally based to provide a framework and direction for local firms on how the WPMS can add value to their companies.

2.10 Chapter summary

This chapter has reviewed published literature on the potential benefits accruing from use of WPMS which can be used to promote and justify increased market adoption of WPMS. The chapter has also highlighted the benefits an organisation can gain from these systems in line with the research objectives. Lastly, the theoretical and conceptual framework has been examined. The next chapter looks at the research methodology including the study design, study population, the sampling technique, data collection and analysis.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter introduces the research methodology that was carried out. It closely examines the research design, target population, sampling and sampling size, the data collection methods and tools that be used and the data collection procedure.

The validity and reliability of the data was also examined. Lastly, the data analysis method was also discussed.

3.2 Research Design

The research design that was used is descriptive research. In descriptive research, the data was collected without changing the environment. As its name suggests, descriptive research seeks to provide an accurate description of observations of a phenomena. The particular descriptive design method to be used for this research is survey research design.

A survey consists of a predetermined set of questions that is given to a sample. With a representative sample, that is, one that is representative of the larger population of interest, one can describe the attitudes of the population from which the sample was drawn. Further, one can compare the attitudes of different populations as well as look for changes in attitudes over time. A good sample selection is key as it allows one to generalize the findings from the sample to the population, which is the whole purpose of survey research (Yin, 2003).

This design was considered appropriate for this study because it saves time, expenses and the amount of quality information yielded is valid, while interviewer bias is reduced because participants complete identically worded self-reported measures (Adèr, Mellenbergh & Hand, 2008). Mugenda and Mugenda (2003) notes that a survey research attempts to collect data from members of a population by asking individuals about their perceptions, attitudes, behaviors or values in order to describe an existing phenomenon.

3.3 Target Population

A research population is generally a large collection of individuals or objects that is the main focus of a scientific query (Castillo, 2009).

The target population for this study are the employees of Nokia Solutions and Networks (K) ltd that use the Web based Project Management system. The total number of these employees is 160.

3.4 Sampling Size and Sampling Procedure

3.4.1 Sample Size

Patton (1990) defines sampling as the act, process or technique of selecting a suitable sample, or a representative part of a population for the purpose of determining parameters or characteristics of the whole population.

According to Mugenda & Mugenda (2003) a sample size of between 10 and 30 % is a good representation of the target population and hence the 30% is adequate for analysis, 48 respondents from a total of 160 users of the system. In this regard, 30% of the population was used as the sample size for this study. The sample size used was 48 respondents.

3.4.2 Sampling Procedure

The sampling procedure that was most ideal for this study was the stratified random sampling. www.investopedia.com defines stratified random sampling as a method of sampling that involves the division of a population into smaller groups known as strata. In this technique, the strata are formed based on members' shared attributes or characteristics. A random sample from each stratum is taken in a number proportional to the stratum's size when compared to the population. These subsets of the strata are then pooled to form a random sample.

This sampling procedure worked very well given that potential respondents in the population already belong to specific departments. Each of the respondents was selected from the different departments using stratified random sampling from the list of department's employees. With the use of this technique, the goal is to give all the clusters equal chances of being selected.

From table 3.1 below, the sample size taken for this study was 48 respondents based on the 30% sampling size as discussed.

Table 3. 1: Sampling size

Department	Population	Samples taken (30%)
PMO	50	15
Finance	20	6
Project Management	35	10
Cost/M&E	30	9
Logistics	25	8
Total	160	48

3.5 Data collection instruments

This study used only primary data collected through the use of questionnaires. The proposed questionnaire shall comprise both structured and open-ended questions which shall be self-administered. Given responses are gathered in a standardized way. Using questionnaires made it possible to collect large amounts of information from a large number of people in a short period of time and in a relatively cost effective way (self-administered), this data collection technique was best suited for the study. Also, results of the questionnaires can be quickly and easily quantified by either a researcher or through the use of a software package.

The questionnaire was structured in four sections; the first section comprised of background information, and data pertaining to the first research question. The second section covered the second research question while the third and fourth section covered the third and fourth research questions respectively.

3.5.1 Pilot testing for the instruments

The instrument i.e. the questionnaire was pilot tested to ensure that the questions were understood by the respondents and there were no problems with the wording or measurement. The pilot test number which was used was 10 respondents.

The aspects that were evaluated during the pilot test include: availability of study population timing, acceptability of the questions asked, willingness of the respondents to co-operate, discovering errors in the instrument and checking if there is any need to revise the format of the tool.

3.5.2 Validity of the instrument

Validity is the amount of systematic or built-in error in measurement (Norland, 1990). Validity means that we are measuring what we want to measure. Validity seems to emerge from the internal and external consistency and relevance of the questionnaire. In other words reliability of a questionnaire refers to the quality of tool while validity refers to the process used to employ the tool in use, i.e. the process used to conduct the questionnaire.

The questions that were addressed in determining the validity of the questionnaire include: was the questionnaire valid? In other words, was the questionnaire measuring what it intended to measure? Does it represent the content? Was it appropriate for the sample/population? Was the questionnaire comprehensive enough to collect all the information needed to address the purpose and goals of the study?

The type of validity that was employed for the study was content validity. Content validity is the extent to which the elements within a measurement procedure are relevant and representative of the construct that they will be used to measure (Yin, 2003). This validity was the most ideal as the users of the WPMS are familiar with the system and had a lot of experience using the system in the day to day work.

3.5.3 Reliability of the instrument

Reliability means the consistency or repeatability of the measure. This is especially important if the measure is to be used on an on-going basis to detect change.

Reliability is a characteristic of the instrument itself, but validity comes from the way the instrument is employed.

The reliability that was employed within the questionnaire is the alternate-form reliability where differently worded forms were used to measure the same attribute. Here, questions or responses are reworded or their order is changed to produce two items that are similar but not identical.

3.5.4 Data collection procedure

The data collection procedure to be used for this study is online questionnaires. The online portal to be used is www.surveymonkey.com. The beauty of online questionnaires is that they are accessible both by the respondent and the one issuing out questionnaires, meaning that the questionnaire fill in can be traced at a click of a button status of the qu

There is also no risk of losing the hard copy of the questionnaire as the data is available in the online databases, and these are quite secure and the data is backed up to enable 100% availability.

3.6 Data analysis methods

Descriptive statistics were used to analyze the data collected from the different respondents. According to Mendenhall & Beaver (2005), descriptive statistics are used to draw conclusions and make predictions based on the descriptions of data. In this study, inferences were made about a population from analyses of data obtained from a sample. That is, we can take the results of an analysis using a sample and can generalize it to the larger population that the sample represents. The researcher analyzed the data using computer packages; SPSS(Statistical Package for Social Scientists) and Microsoft Excel 2003. Finally, the data collected was summarized using a combination of tables, percentages and statistical commentary

3.7 Operationalization of Variables

Table 3. 2: The operationalization of variables

Objective	Variable	Indicators	Measurement scale	Tools of analysis	Type of data analysis
To examine the influence of document management by use of WPMS on organisation performance.	Independent: Document Management System	-Document lifecycle management	Ordinal	Mean	Descriptive
		-User specific view and access	Ordinal	Percentage	Descriptive
		-subcontractor documentation upload	Ordinal		
To examine the influence of cash flow management by use of WPMS on organisation performance activities.	Independent: Cash flow system	-Site based ordering and tracking via SAP	Ordinal	Mean	Descriptive
		-subcontractor payment trigger	Ordinal	Percentage	Descriptive
		-customer invoicing trigger	Ordinal		
To assess how access to project reports via WPMS influence organisation performance.	Independent: Reporting System	-Real time project analytics	Ordinal	Mean	Descriptive
		- Real time project status	Ordinal	Percentage	Descriptive
		- Flexible report generation	Ordinal		
		-Standardized reporting portfolio	Ordinal		
To examine the level at which quality management	Independent: Quality Management system	-Quality checklist	Ordinal	Mean	Descriptive
		-Subcontractor self assessment	Ordinal	Percentage	Descriptive
		-Quality Assessment by	Ordinal		

t by use of WPMS influence organization performance.		Nokia solutions	Ordinal		
	Dependent: Organizational Performance	Sustainability/continuity -Standardization -Partnership linkages -Cash flow -Progress tracking -Rollout planning	Ordinal Ordinal Ordinal Ordinal	Mean	Descriptive

3.8 Ethical Consideration

The researcher and his trained team of research assistants gave assurance to the respondents regarding confidentiality of information that was obtained. There was an assurance phrase in the introductory letter, as well as on the questionnaire.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter discusses the interpretation and presentation of the findings. This chapter presents analysis of the data on the influence of Web Based Project Management Systems (WPMS) on organizational performance a case of Nokia Solutions and Networks (NSN) Kenya. The chapter also provides the major findings and results of the study.

4.2 Response Rate

The study targeted a sample size of 48 respondents from which 48 filled in and submitted the questionnaires making a response rate of 100.0%. This response rate was good and representative and conforms to Mugenda and Mugenda (1999) stipulation that a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good and a response rate of 70% and over is excellent.

4.3 Demographic Characteristics

The study sought to establish the background information of the respondents including the department they work for and the duration of work in the institution.

The study sought to find out the departments that the respondents worked in the institution. The respondents indicated they worked in: Project Management, PMO, Cost and Progress, Logistics and Finance & Controlling (F&C).

The study also sought to establish the highest level of education of the respondents. The findings are as presented in Table 4.1.

Table 4. 1: Highest Level of education

	Frequency	Percentage
Post Graduate	16	33.3
Undergraduate	25	52.1
Diploma	5	10.4
Certificate	2	4.2
Total	48	100.0

According to the findings in Table 4.1, 25(52.1%) respondents had an undergraduate degree level of education, 16 (33.3%) had a post graduate degree level of education, 5 (10.4%) had a diploma level of education and 2 (4.2%) had a certificate level of education. This implies that the respondents had a high level of education and therefore could appropriately respond on the issues of the influence of web based project management systems (WPMS) on organizational performance the case of Nokia Solutions and Network Kenya.

The study further sought to establish how long had the respondents worked in the institution. The findings are as presented in Table 4.2.

Table 4. 2: Duration of Work in the Institution

	Frequency	Percentage
1 to 5 years	17	35.4
6 to 10 years	22	45.8
11 to 15 years	9	18.8
Total	48	100.0

From the findings, 22 (45.8%) respondents had worked in the institution for 6 to 10 years, 17 (35.4%) for 1 to 5 years and 9 (18.8%) for 1 to 5 years. This implies that the respondents had worked long enough with the institution and therefore had sufficient knowledge of the institution to respond to the questionnaire.

4.4 Cash flow System and organizational performance

The study sought to find out the extent that Cash flow System influence performance of Nokia Solutions and Networks Kenya and to which extent that different aspects of Cash flow System in the Web based project management system influence performance of Nokia Solutions and Networks Kenya.

Table 4. 3: Extent that Cash flow System influence Organizational Performance

Responses	Frequency	Percentage
Very great extent	9	18.2
Great extent	26	54.5
Moderate extent	7	14.5
Very low extent	4	7.3
Low extent	3	5.5
Total	48	100.0

According to the findings, 26 (54.5%) of the respondents indicated that Cash flow System influence the performance of Nokia Solutions and Networks Kenya to a great extent. 9 (18.2%) said to a very great extent, 7(14.5%) said to a moderate extent, 4(7.3%) said to a very low extent and 3(5.5%) indicated to a low extent. This is in line with Matheu (2005) who states that in a nutshell, WPMS enables the project to be completed under the agreed budget and following the agreed schedule and also improves the communication between the people, hence influencing organizational performance positively.

Table 4.4: Extent that various Cash flow System influence Organizational performance

Indicator	Frequency					Total Respondents
	Very great extent	Great extent	Moderate extent	Low extent	Very low extent	
Key project and transactional data alignment	20	16		12		48
Internal Acceptance(IA) for subcontractor payment	22	23		3		48
Customer Acceptance(CA) for Customer invoicing	29	13		6		48
Site based ordering and tracking	18	27		3		48

Table 4. 5: Extent that various aspects of Cash flow System influence Organizational performance analysis

	Mean	Standard deviation
Key project and transactional data alignment(with SAP)	4.417	0.626
Internal Acceptance(IA) for subcontractor payment	4.258	0.852
Customer Acceptance(CA) for Customer invoicing	4.104	0.639
Site based ordering and tracking via SAP	4.063	0.974

The mean and standard deviation for table 4.5 are derived from the responses from table 4.4.

According to the findings, the Cash flow Systems that influence the performance of Nokia Solutions and Networks to a great extent include key project and transactional data alignment (with SAP) as shown by a mean score of 4.417, Internal Acceptance (IA) for subcontractor payment as indicated by a mean score of 4.258, Customer Acceptance (CA) for customer invoicing as expressed by a mean score of 4.104 and site based ordering and tracking via SAP as expressed by a mean score of 4.063. From the statistics above, it shows that the greatest aspect of the cash flow system that influences performance is the key project and transactional data alignment (with SAP). This is in line with O'Brien (2000) who posits that the adoption of WPMS minimizes the project life cycle as the information is delivered instantly making faster the decision making process. It avoids all the possible delays caused by written feedback as there is no time between the request and feedback actions. Also, minimizing the project life cycle brings benefits such as reduction of costs and expenditures.

The respondents intimated that Web Based Cash flow System influence performance of Nokia Solutions and Networks Kenya as it is a great enabler and improves efficiency, adds value in the invoicing and payment process, integrates the functions and brings all key users on one platform, gives complete transparency, helps tracks the services scope of business, invoices and the subcontractor payment. They added that the Web Based Cash flow System is

a key aspect of the business and has a great bearing on project deliverables and improves stakeholder communication.

4.5 Quality Management System and organizational performance

The study sought to determine the extent to which the Quality Management System influences the performance of Nokia Solutions and Networks.

Table 4.6: Extent that Quality Management Systems influence Organizational Performance

Responses	Frequency	Percentage
Very great extent	19	40.0
Great extent	17	36.4
Moderate extent	5	10.9
Very low extent	4	7.3
Low extent	3	5.4
Total	48	100.0

From the findings, majority of the respondents, 19(40%) indicated that Quality Management System influenced the performance of Nokia Solutions and Networks to a very great extent. 17 (36.4%) to a great extent, 5(10.9%) to a moderate extent, 4(7.3%) said to a very low extent and the rest, 3(5.4%) said to low extent. These findings correlate with Nitithamyong and Skibniewski's (2007) research which stipulates that when users of WPMSs increased their use of the advanced features of the systems, performances of time, quality and risk all increased significantly.

Table 4.7: Extent that various aspects of Quality Management System influence Organizational performance

Indicator	Frequency					Total Respondents
	Very great extent	Great extent	Moderate extent	Low extent	Very low extent	
Quality Assessment by Nokia	9	36		3		48
Nokia Quality checklist	14	28		6		48
Subcontractor self-assessment	16	29		3		48

Table 4.8: Extent that different aspects of Quality Management System influence Organizational Performance analysis

	Mean	Standard deviation
Quality Assessment by Nokia	4.333	0.798
Nokia Quality checklist	4.188	0.967
Subcontractor self-assessment	4.092	0.858

The mean and standard deviation for table 4.8 are derived from the responses from table 4.7.

From the findings, the quality management system of the web based project management system (WPMS) influence the performance of Nokia Solutions and Networks to a great extent include quality assessment by Nokia as shown by a mean score of 4.333, Nokia Quality checklist as indicated by a mean score of 4.188 and Subcontractor self-assessment as expressed by a mean score of 4.092. These findings correlate with Cox (2007) who argues

that WPMS can have different functionalities including quality measures of the project which has a bearing on the key performance indicators of the project.

This notwithstanding, there was general consensus among the respondents on the fact that Web Based Quality Management Systems influence performance of Nokia Solutions and Networks Kenya as it ensures that the different quality gates hinge on themselves which provides a self sustaining model and complete project lifecycle. They said that Quality Management System in the WPMS is a wonderful tool with clear dashboards to track performance, helps provide feedback and control to projects, helps in identifying quality gaps and increases customer satisfaction which is an important KPI of the company's performance.

4.6 Reporting System and organizational performance

The study further sought to find out the extent to which the Reporting System influences the success of performance of Nokia Solutions and Networks and the extent that Reporting System aspects influence performance of Nokia Solutions and Networks in Kenya.

Table 4. 9 Extent that Reporting Systems influence the Organizational Performance

Responses	Frequency	Percentage
Very great extent (5)	16	32.7
Great extent(4)	20	41.8
Moderate extent(3)	6	12.7
Very low extent(2)	4	7.3
Low extent(1)	3	5.5
Total	48	100.0

According to the findings, 20 (41.8%) respondents indicated that reporting system influenced performance of Nokia Solutions and Networks to a great extent. 16 (32.7%) to a very great extent, 6 (12.7%) to a moderate extent, 4 (7.3%) to a very low extent and the rest 3 (5.5%) to a low extent. The average of 3.9 shows that there is a positive agreement that the reporting

system influences performance of Nokia solutions. This is in line with Nitithamyong and Skibniewski's (2007) study which says that WPMS enables immediate reporting and feedback.

Table 4.10: Extent that various aspects of Quality Management System influence Organizational performance

Indicator	Frequency					Total Respondents
	Very great extent	Great extent	Moderate extent	Low extent	Very low extent	
Flexible report generation	24	18		6		48
Standardized reporting portfolio	19	23		6		48
Real time project status	14	23		11		48
Real time project analytics	11	29		8		48

Table 4.11: Extent that various aspects of the Reporting Systems influence Organizational Performance analysis

	Mean	Standard deviation
Flexible report generation	4.473	0.530
Standardized reporting portfolio	4.396	0.862
Real time project status	4.292	0.968
Real time project analytics	3.221	0.648

The mean and standard deviation for table 4.11 are derived from the responses from table 4.10.

According to the results in Table 4.11, flexible report generation influence the performance of Nokia Solutions and Networks to a great extent as expressed by a mean score of 4.473, also standardized reporting portfolio and real time project status as indicated by a mean score of 4.396 and 4.292 respectively. However, real time project analytics influence the performance of Nokia Solutions and Networks Kenya to a moderate extent as indicated by a mean score of 3.221. This correlates with Becerik and Pollalis (2006) study which suggest that project teams can manage complex programs with less administration staff and can communicate with greater effectiveness when using WPMS as they are able to share project status and reports via project collaboration.

The respondents added that Web Based Reporting System improves visibility, it provides a snapshot and feedback to performance in the company, helps speed up the communication and enables for fast and accurate project controlling and help in KPI review, provides snapshot of project status. They recommended that the reports generated from the system should be more custom made to fit the user's particular needs.

4.7 Document Management System and organizational performance

The study sought to determine the extent to which Document Management System influences performance of Nokia Solutions and Networks in Kenya and the extent that different aspects of Document Management System influence performance of Nokia Solutions and Networks in Kenya.

Table 4.12: Extent that Document Management Systems influence Organizational Performance

Responses	Frequency	Percentage
Very great extent	8	16.4
Great extent	30	61.8
Moderate extent	5	10.9
Low extent	4	7.3
Very low extent	2	3.6
Total	48	100.0

From the findings, 30 (61.8%) respondents indicated that the document management system influence organizational performance to a great extent, 8 (16.4%) said to a very great extent, 5 (10.9%) to a moderate extent, 4 (7.3%) to a low extent and the rest 2 (3.6%) to a very low extent. This correlate with Cox (2007) who argues that Web Based Document Management Systems results in improved accountability of project team members and reduces the likelihood of delays. As a result it is expected that there will be a better organizational performance. Table 4.13 Extent that various aspects of Document Management Systems influence Organizational Performance

Indicator	Frequency					Total Respondents
	Very great extent	Great extent	Moderate extent	Low extent	Very low extent	
subcontractor documentation upload	17	25		6		48
User specific view and access	14	28		6		48
Document lifecycle management	12	28		8		48

Table 4. 14: Extent that various aspects of Document Management Systems influence Organizational Performance analysis

	Mean	Standard deviation
subcontractor documentation upload	4.354	0.657
User specific view and access	4.292	0.793
Document lifecycle management	4.250	0.974

The mean and standard deviation for table 4.14 are derived from the responses from table 4.13.

On the extent that various aspects of Document Management System influence the performance of Nokia Solutions and Networks Kenya, the respondents indicated that to a great extent subcontractor documentation upload influence the performance of Nokia Solutions and Networks as shown by a mean score of 4.354, also user specific view and access as expressed by a mean score of 4.292 and Document lifecycle management as expressed by a mean score of 4.250 influence the performance of Nokia Solutions and Networks Kenya to a great extent. This is line with Becerik and Pollalis (2006) who state that technology allows the users to “reach and search the project information globally” and thus able to work from anywhere worldwide. These systems ensure all project information and communication threads have been tracked and stored in a structured and credible way. Ahuja, Yang, & Shankar (2009) also state that when utilized, WPMs benefits include, “an increase in the quality of documents and speed of work; better financial control and communications, and simpler and faster access to common data as well as a decrease in documentation errors as use of incorrect data can comprise the scheduled completion of a project and lead to wastage of resources”.

The respondents were of the view that Web Based Document Management Systems reduce bulky information, helps track down project status showing the blockages and workable solutions, gives back-up and facilitates easier reference to information, enhance electronic approval, enables the documents to be tracked anytime, servers ensure that the documents are

always available and soft copies are easier to manage than hard copies. They added that Web Based Document Management Systems ensures standardized and proper folders and full data integrity, easy access and reduce the lag between correction requests and receiving the updated documents and also it helps the environmental aspect. They suggested that the company should move from the platform where the appending of signatures is done on hard copy, thus the system needs to be fully automated to harness the benefits of web based document management.

4.8 Organizational Performance

Table 4.15 Trend of various aspects of Organizational Performance

Indicator	Frequency					Total Respondents
	Greatly Improved	Improved	Constant	Decreasing	Greatly decreased	
Standardization of project activities	14	27	7			48
Cash flow management	11	28	5	4		48
Partnership linkages	3	38	3	4		48
Continuity and Sustainability	14	17	14	3		48

Table 4. 16: Trend of various aspects of Organizational Performance Analysis

	Mean	Standard deviation
Standardization of project activities	4.146	0.655
Cash flow management	3.958	0.754
Partnership linkages	3.833	0.672
Continuity and Sustainability	3.175	0.889

The mean and standard deviation for table 4.16 are derived from the responses from table 4.15.

On the trend of various aspects of organizational performance of Nokia Solutions and Networks Kenya, the respondents indicated that there has been improvement in various aspects of performance of Nokia Solutions and Networks such as standardization of project activities as shown by a mean score of 4.146, cash flow management as expressed by mean score of 3.958 and partnership linkages as indicated by a mean score of 3.833 had improved to a great extent. Continuity and sustainability of Project activities (when a project stakeholder leaves the project) as shown by a mean score of 3.175 was constant. The standardization of project activities had the highest mean implying that it has the highest benefit.

CHAPTER FIVE

SUMMARY OF FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presented the discussion of key data findings, conclusion drawn from the findings highlighted and recommendation made there-to. The conclusions and recommendations drawn were focused on addressing the objective of the study.

5.2 Summary of Study

The study sought to establish the influence of Web Based Project Management Systems (WPMS) on organizational performance a case of Nokia Solutions and Networks (NSN) Kenya.

5.2.1 Cash flow System and organizational performance

The study established that Cash flow System influence the performance of Nokia Solutions and Networks Kenya to a great extent. The study also established that Key project and transactional data alignment (with SAP) as shown by a mean score of 4.417, Internal Acceptance (IA) for subcontractor payment as indicated by a mean score of 4.258, Customer Acceptance (CA) for Customer invoicing as expressed by a mean score of 4.104 and Site based ordering and tracking via SAP as expressed by a mean score of 4.063 influence the performance of Nokia Solutions and Networks Kenya.

The study further found out that that Web Based Cash flow System influence performance of Nokia Solutions and Networks Kenya as it is a great enabler and improves efficiency, adds value in the invoicing and payment process, integrates the functions and brings all key users on one platform, gives complete transparency, helps tracks the services scope of business, invoices and the subcontractor payment. They added that Web Based Cash flow System is a key aspect of the business and has a great bearing on project deliverables, improves stakeholder communication

5.2.2 Quality Management System and organizational performance

The study deduced that Quality Management System influenced the performance of Nokia Solutions and Networks to a very great extent. The study also established that Quality Assessment by NSN influence the performance of Nokia Solutions and Networks Kenya as shown by a mean score of 4.333, Nokia Quality checklist influence the performance of Nokia Solutions and Networks Kenya as indicated by a mean score of 4.188 and Subcontractor self-assessment influence the performance of Nokia Solutions and Networks Kenya as expressed by a mean score of 4.092.

The study also established that there was a general consensus among the employees on the fact that Web Based Quality Management Systems influence performance of Nokia Solutions and Networks Kenya as it ensures that the different quality gates hinge on themselves which provides a self-sustaining model and complete project lifecycle. It was established Quality Management Systems is a wonderful tool with clear dashboards to track performance, helps provide feedback and control to projects, helps in identifying quality gaps and increases customer satisfaction which is an important KPI of our performance.

5.2.3 Reporting System and organizational performance

The study deduced that reporting system influenced performance of Nokia Solutions and Networks to a great extent. Further the study found out that flexible report generation as expressed by a mean score of 4.473, Standardized reporting portfolio as indicated by a mean score of 4.396, Real time project status as shown by a mean score of 4.292 influence the performance of Nokia Solutions and Networks Kenya.

Further, the study established that Web Based Reporting System improves visibility, it provides a snapshot and feedback to performance in the company, helps speeding up the communication and fast and accurate project controlling and helps in KPI review, provides snapshot of project status. They recommended that project reporting especially from iPM should be automated to ensure that reporting works effectively.

5.2.4 Document Management System and organizational performance

The study found out that Document Management System influenced performance of Nokia Solutions and Networks Kenya to a great extent. The study also established that subcontractor

documentation upload as shown by a mean score of 4.354, user specific view and access as expressed by a mean score of 4.292 and Document lifecycle management as expressed by a mean score of 4.250 influence the performance of Nokia Solutions and Networks Kenya.

The study further established that, Web Based Document Management Systems reduce bulky information, helps track down project status showing the blockages and workable solutions, gives back-up and facilitates easier reference to information, enhance electronic approval, enables the documents to be tracked anytime, servers ensure that the documents are always available and soft copies are easier to manage than hard copies. Web Based Document Management Systems ensures standardized and proper folders and full data integrity, easy access and reduce the lag between correction requests and receiving the updated documents and also it helps the environmental aspect.

5.3 Discussion

5.3.1 Cash flow System and organizational performance

The study found out that that Web Based Cash flow System influence performance of Nokia Solutions and Networks Kenya as it is a great enabler and improves efficiency, adds value in the invoicing and payment process, integrates the functions and brings all key users on one platform, gives complete transparency, helps tracks the services scope of business, invoices and the subcontractor payment. Web Based Cash flow System is a key aspect of the business and has a great bearing on project deliverables, improves stakeholder communication. This is in line with O'Brien (2000) who posits that the adoption of WPMS minimizes the project life cycle as the information is delivered instantly making faster the decision making process. It avoids all the possible delays caused by written feedback as there is no time between the request and feedback actions. Also, minimizing the project life cycle brings benefits such as reduction of costs and expenditures. Matheu (2005) states that in a nutshell, WPMS enables the project to be completed under the agreed budget and following the agreed schedule and also improves the communication between the people.

5.3.2 Quality Management System and organizational performance

The study also established that there was a general consensus among the employees on the fact that Web Based Quality Management Systems influence performance of Nokia Solutions and Networks Kenya as it ensures that the different quality gates hinge on themselves which

provides a self-sustaining model and complete project lifecycle. It was established Quality Management Systems is a wonderful tool with clear dashboards to track performance, helps provide feedback and control to projects, helps in identifying quality gaps and increases customer satisfaction which is an important KPI of our performance. This correlates with Cox (2007) who states that it is clear that standardization and quality management in a project delivery reduces the amount of re-work needed and the time needed for generating new projects by storing both the information and knowledge applied to a project in a common repository which enhance organizational performance.

5.3.3 Reporting System and organizational performance

The study deduced that reporting system influenced performance of Nokia Solutions and Networks to a great extent. Further the study found out that flexible report generation as expressed by a mean score of 4.473, Standardized reporting portfolio as indicated by a mean score of 4.396, Real time project status as shown by a mean score of 4.292 influences the performance of Nokia Solutions and Networks Kenya. Further, the study established that Web Based Reporting System improves visibility, it provides a snapshot and feedback to performance in the company, helps speeding up the communication and fast and accurate project controlling and helps in KPI review, provides snapshot of project status. This is in line with Becerik and Pollalis (2006) who suggest project teams can manage complex programs with less administration staff and can communicate with greater effectiveness when using WPMS. Matheu (2005) suggests that WPMSs improve project communication, align business processes increasing transparency as barriers to communication are removed. Nitithamyong and Skibniewski (2007) states that WPMS enhances coordination among team members.

5.3.4 Document Management System and organizational performance

The study further established that, Web Based Document Management Systems reduce bulky information, helps track down project status showing the blockages and workable solutions, gives back-up and facilitates easier reference to information, enhance electronic approval, enables the documents to be tracked anytime, servers ensure that the documents are always available and soft copies are easier to manage than hard copies. Web Based Document Management Systems ensures standardized and proper folders and full data integrity, easy access and reduce the lag between correction requests and receiving the updated documents

and also it helps the environmental aspect. This is line with Becerik and Pollalis (2006) who state that technology allows the users to “reach and search the project information globally” and thus able to work from anywhere worldwide. These systems ensure all project information and communication threads have been tracked and stored in a structured and credible way. Cox (2007) argues that Web Based Document Management Systems results in improved accountability of project team members and reduces the likelihood of delays.

5.4 Conclusion

The study concludes that Web Based Cash flow System influence performance of Nokia Solutions and Networks Kenya as it improves efficiency, adds value in the invoicing and payment process by integrating the functions and bringing all key users on one platform which helps tracks the services scope of business, invoices and the subcontractor payment and ensures complete transparency.

The study also concludes that Web Based Quality Management Systems influence performance of Nokia Solutions and Networks Kenya as it ensures that the different quality gates hinge on themselves which provides a self-sustaining model and complete project lifecycle.

The study further concludes that Web Based Reporting System improves visibility by providing a snapshot and feedback to performance in the company which helps speeding up the communication and as a result there is a fast and accurate project controlling.

Finally the study concludes that Web Based Document Management Systems reduce bulky information, helps track down project status showing the blockages and workable solutions, gives back-up and facilitates easier reference to information, enhance electronic approval, enables the documents to be tracked anytime, servers ensure that the documents are always available and makes soft copies management easier than hard copies.

5.5 Recommendations

From the research findings and conclusions, the study recommends that Nokia Solutions and Networks Kenya should continue investing more resources in the Cash flow System as this will ensure there is transparency and hasten the payment process in the company.

The study recommends that Nokia Solutions and Networks Kenya should recruit experts to monitor the Web Based Quality Management Systems in the company to ensure that they are up to the expected standards and they are tamper proof.

The study further recommends that Nokia Solutions and Networks Kenya should adopt the Web Based Reporting System in all departments and processes as it improves visibility by providing a snapshot and feedback to performance in the company which helps speeding up the communication and as a result brings about a fast and accurate project controlling.

The study finally recommends that Nokia Solutions and Networks Kenya should move from the platform where the appending of signatures is done on hard copy which brings about delays in the approval process as the person in charge must be there physically whereas in a Web Based Document Management Systems this can be done remotely. Thus the system needs to be fully automated to harness the benefits of automated document management.

5.6 Suggestion for Further Studies

Another study should be done to investigate the influence of Web Based Project Management Systems in companies in other sectors for example construction, banking, insurance etc. A similar study should also be done on other small companies since their operations are different from that of large companies. Further studies should be done on the factors affecting the adoption of Web Based Project Management Systems on organizational performance.

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APPENDICES

Appendix 1: Transmittal Letter

Linda Nzilani Muema

P.O. Box 9019-00100

Nairobi.

January 10th , 2014

Dear Sir/Madam,

RE: REQUEST FOR PARTICIPATION IN A RESEARCH STUDY

I am a final MA degree student at the University of Nairobi. My area of specialization is project planning and management. I am currently undertaking a research on “**INFLUENCE OF WEB BASED PROJECT MANAGMENT SYSTEMS ON ORGANIZATIONAL PERFORMANCE: A CASE OF NOKIA SOLUTIONS AND NETWORKS KENYA**”.

I would be grateful if you could spare some time from your busy schedule and complete the enclosed questionnaire. All the information provided will be used purely for academic purposes only and your identity be treated with utmost confidentiality.

Thank you for your cooperation.

Yours faithfully,

Linda Nzilani Muema

Appendix II: Research Questionnaire for Employees

Kindly answer the following questions by writing a brief answer or ticking in the boxes provided.

PART A: BACKGROUND INFORMATION

1. Which is your highest level of education?

- Post Graduate []
- Undergraduate []
- Diploma []
- Certificate []

2. How long have you worked in this institution?

- 1 to 5 years []
- 6 to 10years []
- 11 to 15 years []
- 16 to 20 years []
- 21 years and above []

PART B: Cash Flow in the WPMS and organisation performance

3. To what level does the cash flow module within the Web Based Project Management Systems influence Nokia Solutions and Networks cash flow?

- Very great extent [5] Moderate extent [3] Very low extent [1]
- Great extent [4] Low extent [2]

4. To what extent does the Web Based Project Management Systems influence the following aspects of Nokia Solutions and Networks cash flow?

	Very great extent	Great extent	Moderate extent	Low extent	Very low extent
Key project and transactional data alignment					
Internal Acceptance(IA) for					

subcontractor payment					
Customer Acceptance(CA) for Customer invoicing					
Site based ordering and tracking					

5. How does the cash flow system within the WPMS influence organizational performance of Nokia Solutions and Networks Kenya?

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PART C: Quality Management in the WPMS and organisation performance

6. To what level does Quality Management module in the WPMS influence organizational performance of Nokia Solutions and Networks Kenya?

- Very great extent [5] Moderate extent [3] Very low extent [1]
 Great extent [4] Low extent [2]

7. To what extent do the following aspects of Quality Management Module influence organizational performance of Nokia Solutions and Networks Kenya?

	Very great extent	Great extent	Moderate extent	Low extent	Very low extent
Nokia Quality checklist					
Subcontractor self-assessment					
Quality Assessment by NSN					

8. How does the Nokia Solutions and Networks Kenya Quality Management module within the WPMS influence organizational performance of Nokia Solutions and Networks Kenya?

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PART D: Reporting and organizational performance

9. To what extent does the WPMS project reporting influence organizational performance of Nokia Solutions and Networks Kenya?

Very great extent [5] Moderate extent [3] Very low extent [1]
 Great extent [4] Low extent [2]

10. To what extent do the following aspects of the WPMS Reporting influence organizational performance of Nokia Solutions and Networks Kenya?

	Very great extent	Great extent	Moderate extent	Low extent	Very low extent
Real time project analytics					
Real time project status					
Flexible report generation					
Standardized reporting portfolio					

11. How does project reporting from the WPMS influence organizational performance of Nokia Solutions and Networks Kenya?

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PART E: Document Management and organizational performance

12. To what extent does electronic (soft copy) Document Management via the WPMS influence organizational performance of Nokia Solutions and Networks Kenya?

Very great extent [5] Moderate extent [3] Very low extent [1]
 Great extent [4] Low extent [2]

13. To what extent do the following aspects of the WPMS document management system influence the organizational performance of Nokia Solutions and Networks Kenya?

	Very great extent	Great extent	Moderate extent	Low extent	Very low extent
Document lifecycle management					
User specific view and access					
subcontractor documentation upload					

14. In your opinion, how does the WPMS document management system influence organizational performance of Nokia Solutions and Networks Kenya?

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PART F: Organizational Performance

15. What has being the trend of the following aspects of organizational performance of Nokia Solutions and Networks Kenya?

	Greatly Improved	Improved	Constant	Decreasing	Greatly decreased
Cash flow					
Standardization of project activities					
Sustainability/continuity					
Partner linkages(subcontractor and customer)					

THANK YOU FOR YOUR PARTICIPATION