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Change Management in Small and Medium Enterprises: Leveraging Information Technology

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Introduction

Information technology (IT) has been deemed as one of the most influential innovations in history, changing nearly everything from an individual's lifestyle to societal structures. In the business world, we also witnessed the accelerating fusion of business and IT. IT-based innovations are transforming, and revitalizing many industries. Start-up providing IT-related products and services emerge and scale up at an astonishing speed.

For traditional companies, despite the fact that IT becomes a necessity of doing business, some of them constantly outperform their competitors by better leveraging IT. It is vital for future business leaders, entrepreneurs, and professionals to have a working knowledge of modern IT and a deep understanding on how IT has shaped and will shape products, organizations, and competition.

In information Technology, change is inevitable. The word change (Free Dictionary) literally as a verb means; alter - exchange - vary - shift - convert – transform, as a noun; alteration - shift - variation - exchange – mutation. Change can be mathematical, organisational, and so on. For every process that can be carried out manually, when change occurs, the process is realigned to manage that change via a manual process. Information technology helps to manage such changes leveraging tools or models.

Abstract

With increasing market pressure and fragmentation, Small to Medium Sized Enterprises (SMEs) must move beyond the change philosophy of Continuous Improvement (CI) and develop a culture of innovation. In this paper, we introduced the thesis topic, reviewed what other authors have written, analyzed the study by carrying out research with the use of questionnaire for 2 case studies – Rivers State Microfinance Agency and First Global Microfinance Banks (SMEs). From the findings, we discovered that SMEs do not use technology to drive their business processes. The results of the findings were developed to capture the design requirements. In the design, we used modular-view controller for the interface, and Rapid Application Development design. Furthermore, we developed a model that will drive their business process, capture user request and change in their request, provide the necessary reporting that will drive growth of the business. The name of the model was CHANGEAPP. Looking at the model, several prototypes were developed before the final copy was implemented. Conclusively, the importance of change management in the SMEs in Nigeria is not negligible. Both SMEs were found to practice change management but they do not give recognition to the importance of change management leveraging Information Technology. We will recommend that; large organisations and individuals should leverage on information technology to manage change, in our fast growing and evolving society, it is important that individuals and organisations derive the full benefits and value of information technology. Governments and people can organize computer training programs free of cost or at a reduced cost.

Statement of the Problem

Many institutions today, businesses (Small and medium business enterprises), Large enterprises, individuals adopt the traditional ways to manage change in their environment and businesses. These traditional ways have created huge gaps on their path to growth and stability. Most businesses cannot account for vivid financial books, individuals or institutions cannot recall or provide documentations on processes, actions or improvements in certain aspects.

Literature Review – Conceptual Clarifications

Small and Medium Enterprises in Nigeria

At the forefront of recent efforts to modernise and improve Nigeria's ailing economy have been a strong focus on macroeconomic stabilisation, and the pursuance of a massive trade and investment liberalization programme to encourage foreign direct investment in the country. In achieving this, the country has relaxed most restrictions on current and capital transfers, introduced tax relief for those multi-nationals willing to invest in the country, and improved access to foreign exchange at near market rates. Another caveat to the liberalization programme has been the embarkment on a massive privatisation campaign of public institutions, again largely to attract foreign investment with the hope that this would help increase economic activity and bring in the much needed revenue.

This particular approach to trade and investment liberalisation can be seen as a right step in the right direction. In terms of revenue generation, large multi-nationals do help to bring in the much needed foreign exchange. They help create the much needed jobs by employing Nigerians. But in reality, how much do they contribute to the nation's economic development and how much can they help us attain lasting and sustainable prosperity?

The role of the Small and Medium Enterprises (SME) as a catalyst for economic growth and development has been well documented in the economic literature and recognized in most countries. For example, in many of the newly industrialized nations, more than 98 percent of all industrial enterprises belong to the SMEs sector and account for the bulk of the labour force. SMEs enjoy a competitive advantage over large enterprises in servicing dispersed local markets. Cognisant of this fact, programmes of assistance, especially, in the areas of finance, extension and advisory services, as well as provision of infrastructure have been designed by the Nigerian government for the development of the SMEs. Specifically, successive governments in Nigeria have in the last three decades shown much interest in ensuring adequate financing for Small and Medium Enterprises (SMEs), by establishing various schemes and specialized financial institutions to provide appropriate financing to the subsector. The failure of most of these schemes revealed that the problem of SMEs in Nigeria is not limited to lack of long-term financing, but also

inadequate management skill and entrepreneurial capacity.
According to Sanusi (2003), over the years, the Federal Government has taken various steps, including monetary, fiscal and industrial policy measures to promote the development of Small and Medium Scale Enterprises (SMEs). Specifically, the Government has been active in the following areas:

(i) funding and setting up of industrial estates to reduce overhead costs;
(ii) establishing specialized financial institutions, including the Small Scale Industry Credit Scheme (SSICSs), Nigerian Industrial Development Bank (NIDB), Nigerian Bank for Commerce and Industry (NBCI) to provide long-term credit;
(iii) facilitating and guaranteeing external finance by the World Bank, African Development Bank and other international financial institutions;
(iv) facilitating the establishment of the National Directorate of Employment (NDE), this also initiated the setting up of new SMEs;
(v) establishment of the National Economic Reconstruction Fund(NERFUND) to provide medium to long-term local and foreign loans for small, and medium scale businesses, particularly those located in the rural areas; and
(vi) provision of technical training and advisory services through the Industrial Development Centers.

Change Management

Literally, there is no universally accepted definition of change management. Nickols (2010) claimed that all definitions of change management can be catergorised into four views namely;
Change management as a tasks of managing change
As an area of professional practice
As a body of knowledge
And as a control mechanism

The most common view of change management is the last one where change management is seen as mechanism or process to control the implementation of change in an organization. However, few scholars like Mackenzie-Robb (2004) view change management as a body of knowledge as well as a professional practice.
According to ITIL (Information Technology infrastructure Library), change management is the addition, modification, or removal of approved, supported or baselined hardware, network, software application, environment.
According to Lorenzi (2005), he defined change management as 'the process by which an organization reaches its future state – the vision". Though the used the term 'process' for change management, the focus of his definition is on the approach to this process. For him, change management should have the vision-oriented approach. It should be aimed at facilitating the efforts to achieve the pre-defined aim of an organization mentioned in the orgnisation's corporate strategy. He asserted that before implementing a change one needs to have a vision for change and must communicate this vision to individuals in the organization to make them serve as change agent. Mackezie-Robb (2004) also recognized the importance of having a clear idea of the desired future state of organization and named it as 'change goals'. He asserted that their goals ought to answer the 'why to change', 'what to change', and 'how to get questions'.
For Lientz and Rea (2004), change management is 'the approach to plan, design, implement, manage, measure and sustain changes in business process and work'. As compared to Lorenzi (2005), Lientz and Rea (2004) did not explicitly mention the nature of approach. Furthermore, they also recognized change management as a process and suggested some activities which ought to be the part of change management process (Lientz and Rea 2004). Combining the two views of change management, we can say that change management is "a process of planning, designing, implementing, managing, measuring and sustaining change with a vision-oriented approach".

Research Methodology/ Research Strategy

Research strategy is the element through which data is collected in a study. Keeping in view the research paradigm and method of the present study which clearly favours exploratory research and research purpose which asks for the contextual understanding of behavioral and structural change process in SMEs, I have decided to adopt case study research strategy.
While adopting the case study strategy for the present study, I had has two purposes in my mind. The first purpose of using case study, as described above, was to thoroughly analyse the change management process as practiced in the SMEs in Port Harcourt, Rivers State, Nigeria and to understand the value given to change management in these organizations. However, I was also interested in examining how change in the degree of importance given to communication can impact the change management process in an organization. This purpose can only be achieved either by longitudinal case study of a single SME before and after the use of communication as change management tool or by cross sectional case study of two or more organizations with different approach toward communication and change management. However, for avoiding the collection of massive deluge of information, as identified by Collis and Hussey (2003) as an important weakness of case study strategy, I conducted a cross-sectional case study on two SMEs only.
The unit of analysis in this case study is the organization that is the selected SMEs in Port Harcourt that have an IT environment.
These two SMEs are; Rivers State Microfinance Agency and First Global Microfinance Banks.
These similarities in these two companies make them a good choice for comparison in this present study.
The secondary data was collected from this organisations via response to questionnaires submitted in these organisations and the collected data was analysed deductively to examine how change management is conducted in these organisations and the role played by IT in this regard. The findings obtained from these organisations was compared and contrasted with each other to provide a more general output.

Results and Discussion

After consultative interaction with the IT Manager of RIMA and First Global Microfinance Banks, the following findings were found;
Supply Chain Management: this is one of the processes that occur at RIMA. The workflow of the original process and change in process is as follows:
At the beginning of the year, RIMA sends out RFQ for Service Line Agreements to suppliers for a particular product by publishing advert in paper.
Suppliers responds via a submission of hard copy to RIMA
The IT Manager, Head of Finance and Managing Director reviews the Submissions

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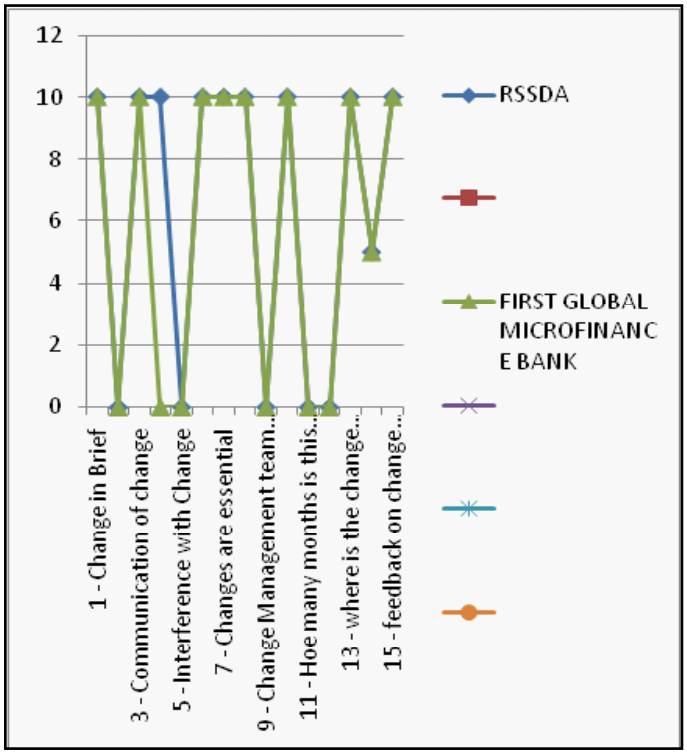
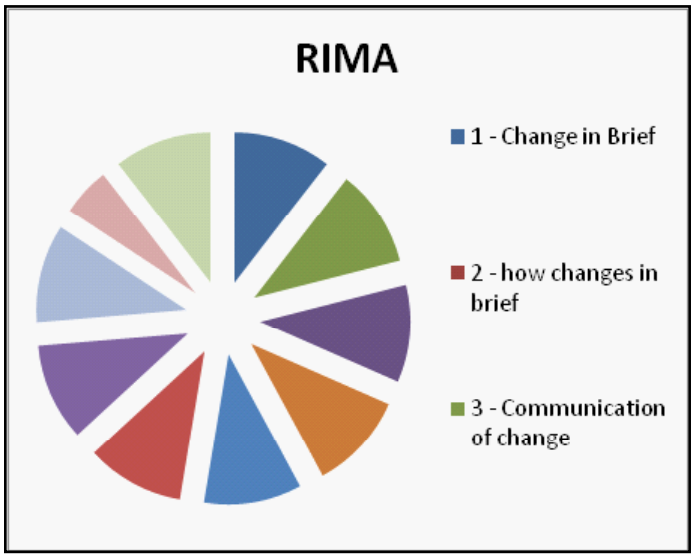
Final Approval of supplier by Managing Director is submitted to the IT manager.
The IT Manager sends a mail to the Supplier that won
Supplier signs Service line Agreement
When a new IT work tool is to be purchased or changed,
End – user fills a request, sends a memo to IT Manager via email approved by his/her HOD
IT Manager reviews with the Head of Dept and Head of Finance at first,
If after review, they cannot conclude, End-user is included in another review to ascertain if the tool will be changed.
If review succeeds, IT Manager writes a memo to supplier.
If review fails, IT Manager replies memo to End-user
Supplier sends in invoice for the work tool to IT Manager
IT Manager submits invoice to Head of Finance
If it is within approval limits, Head of Finance approves
If it is not within approval limits, Head of Finance forwards to Managing Director for final approval
IT manager writes via email to supplier to deliver the work tool and collect payment
IT manager sends a mail to end-user to pick up work tool
Disbursement of Funds to Small Businesses: this is a process whereby loans are disbursed to small businesses. RIMA is in partnership with 6 microfinance banks that holds cash on behalf of the agency. When a small business engages RIMA, they are referred to a microfinance agency. This is a workflow of the process that occurs and its change.
Small business goes to a Microfinance Bank A and fills a form for a loan
Microfinance bank sends the filled form to RIMA via courier
RIMA receives the form and reviews the form with the Microfinance Bank.
Small business owner is contacted to finalise review.
If the small business owner satisfies the conditions, the filled form is taken to management for approval
If the small business owner does not satisfy the condition, he is contacted via the microfinance bank
Management approves the loan and reverts decision to Microfinance bank via a memo
Microfinance bank disburses loan facility to small business owner.
After evaluation of questionnaire administered;
The following findings were gathered:
After gathering of findings on these two case studies, the following analysis were deduced. The measurements for analyzing the questionnaires are as follows:
10 – Yes, Changes exist
0 - No

	RIMA	First Global Microfinance Bank
1 - Change in Brief	10	10
2 - how changes occur in brief	0	0
3 - Communication of change	10	10
4 - Staffs are trained on the change	10	0
5 - Interference with Change	0	0
6 - Impact of Change	10	10
7 - Changes are essential	10	10
8 - Staffs affected by change	10	10
9 - Change Management team exists	0	0
10 - Monitoring of Change	10	10
11 - Hoe many months is this change implemented	0	0
12 - Is change done for a permanent period	0	0
13 - where is the change documentation stored	10	10
14 - does the change leverage technology	5	5
15 - feedback on change leverage on technology	10	10

Findings on Change management in organizational strategy; leveraging information technology





System Design

Systems design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could see it as the application of systems theory to product development. There is some overlap with the disciplines of systems analysis, systems architecture and systems engineering. Object-oriented analysis and design methods are becoming the most widely used methods for computer systems design The UML has become the standard language in object-oriented analysis and design. It is widely used for modeling software systems and is increasingly used for high designing non-software systems and organizations. In this paper work, I used the Rapid Application Development (RAD) Design for the design of the proposed model applying the Unified Markup language (UML) Modeling technique. Rapid application development (RAD) is a methodology in which a systems designer produces prototypes for an end-user. The end-user reviews the prototype, and offers feedback on its suitability. This process is repeated until the end-user is satisfied with the final system.
Below are the structural and behavioral views of the design for the proposed model;

Class Diagram

A class diagram in the Unified Modeling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among the classes.

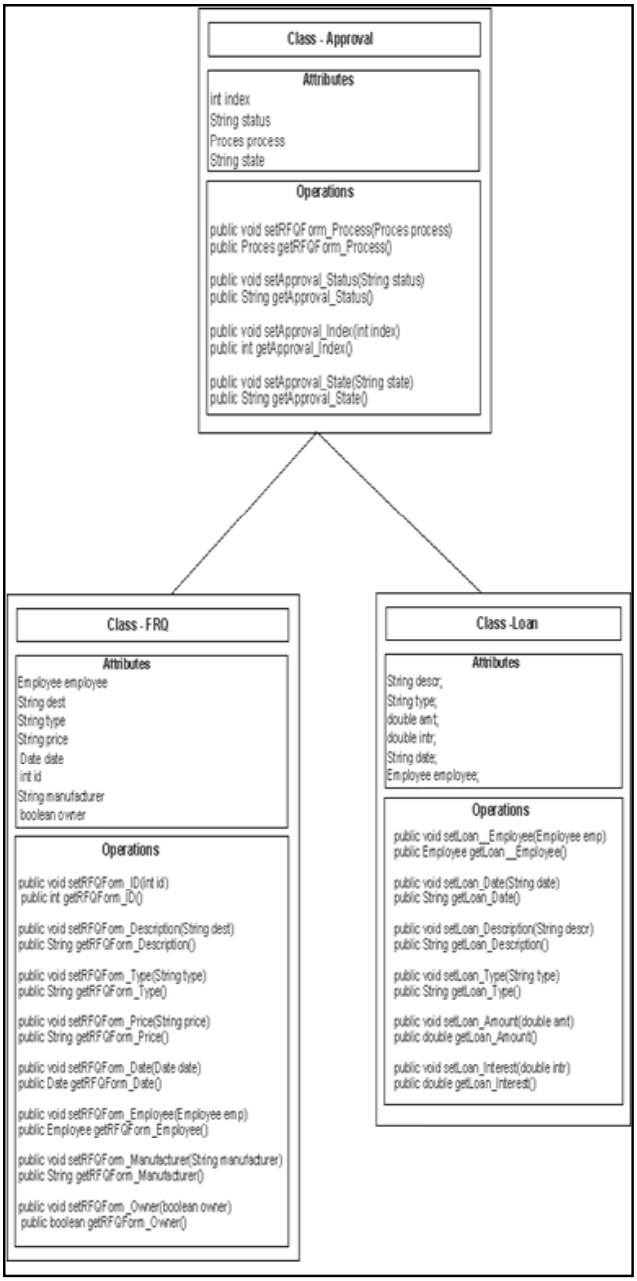


Fig 3.6a : Proposed class diagram

Activity Diagram

Activity diagrams are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams can be used to describe the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control.
Activity diagrams are constructed from a limited number of shapes, connected with arrows. The most important shape types:
rounded rectangles represent actions;
diamonds represent decisions;
bars represent the start (split) or end (join) of concurrent activities;
a black circle represents the start (initial state) of the workflow;
An encircled black circle represents the end (final state).
Arrows run from the start towards the end and represent the order in which activities happen.

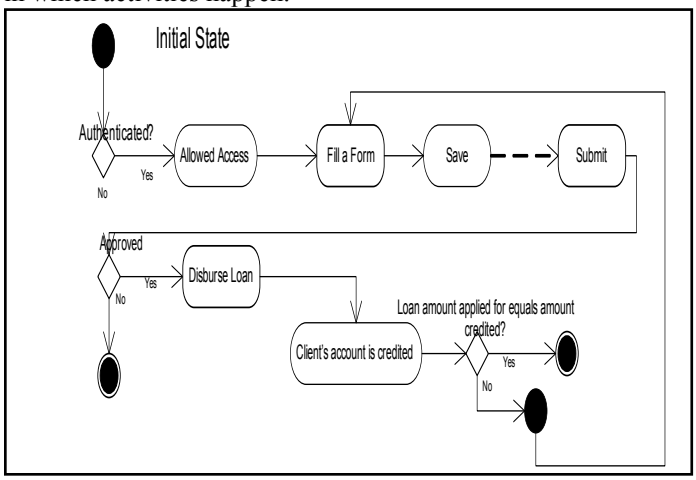


Fig 3.6.2a : Activity Diagram for Loan Application Process

Use Case Diagrams

A use case diagram at its simplest is a representation of a user's interaction with the system and depicting the specifications of a use case. A use case diagram can portray the different types of users of a system and the various ways that they interact with the system. This type of diagram is typically used in conjunction with the textual use case and will often be accompanied by other types of diagrams as well.
A UML use case diagram for the interaction of a client and a system.

Flowchart

A flowchart is a type of diagram that represents an algorithm or process, showing the steps as boxes of various kinds, and their order by connecting them with arrows. Process operations are

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represented in these boxes, and arrows; rather, they are implied by the sequencing of operations. Flowcharts are used in analyzing, designing, documenting or managing a process or program in various fields.

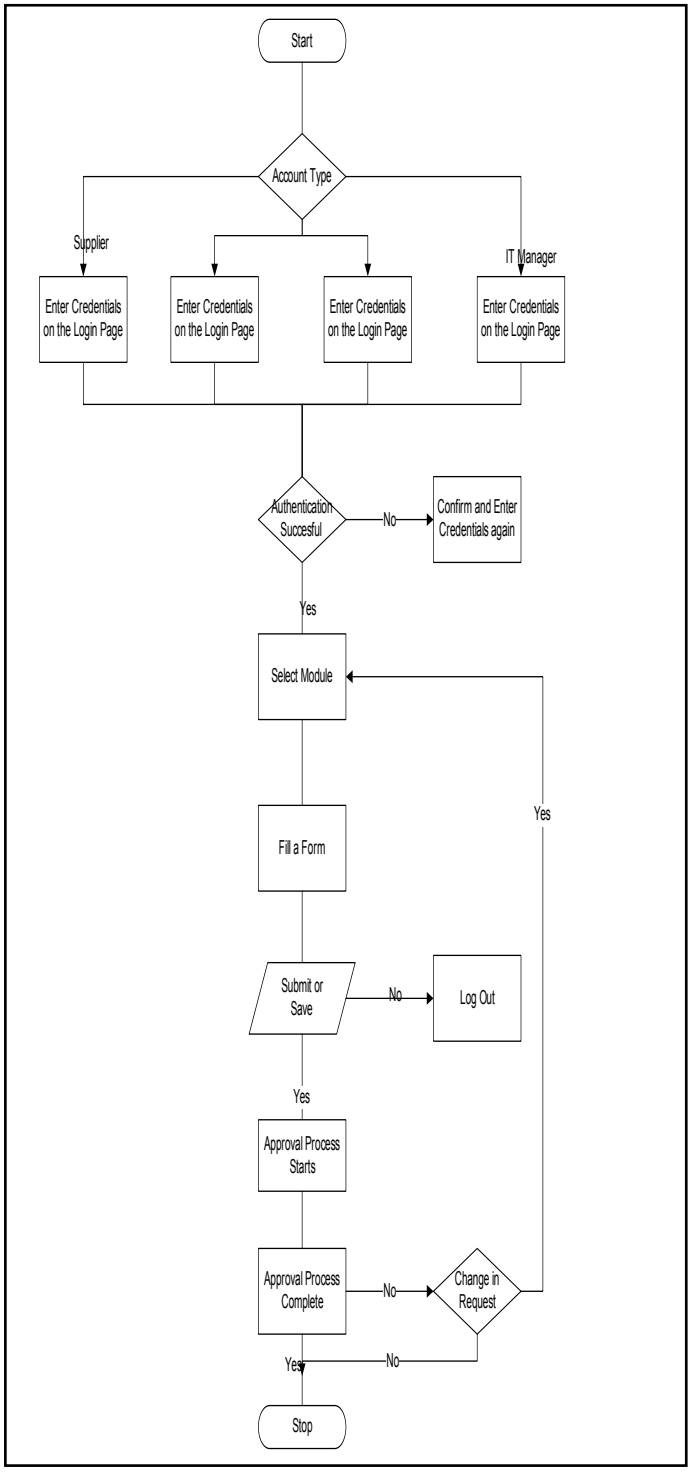
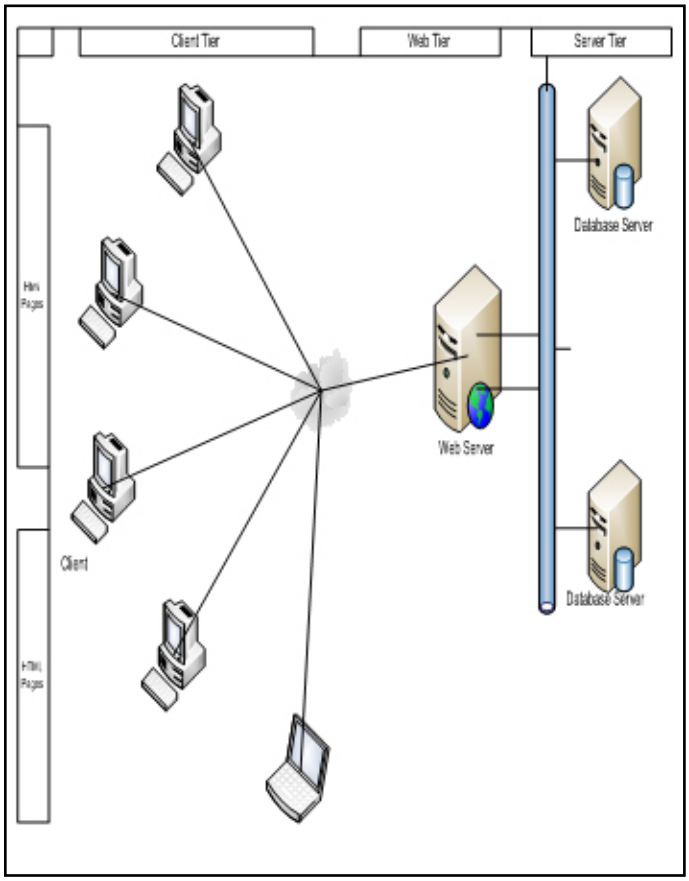


Fig 3.5.4a : Flowchart illustrating the overall flow for the proposed model

System Architecture

The architecture of the proposed system is a 3-tier architecture. This architecture displays the server, middle tier and client tiers.
For this paper work,
The server tier consists of the services running at the backend which includes the apache server, my sql database.
The Middle tier consists of the servlet that runs on the apache container
The Client tier; jsp, html pages that runs on the browser.



Programming

Choice of Programming Language

The programming languages used for this research work are:
Java
Dreamweaver

Java

Java is a computer programming language that enables programmers to write computer instructions using an English Based Commands, instead of having to write in numeric codes. Java is a high level language because it can be read and written easily by humans. Java has a set of rules that determine how the instructions are written. These rules are known as "syntax". Once a programme has been written, the high level instructions are translated into numeric codes that computers can understand and execute.
When it was released in the spring of 1995 by Sun Microsystems, Java unleashed a level of interactivity on the Web that had never been possible before. Java makes the Web interactive.
Java connects with HTML and the Web through a special HTML element called APPLET, which allows developers to include Java programs called applets on Web pages. These applets are essentially software programs that the user's browser downloads (automatically, as part of Web page observation) and executes. With real-time graphical input and output possible through the applet on the page, Java thus opens windows to into richer levels of interactivity and visualization.
Java is a programming language that provides a foundation for developing internet applications. It does this trough applets which

are programs executed as part of a Web page and displayed with a Java enabled browser.
Java is developed to solve a variety of problems that have plagued the computing community for years; running well on the internet is almost a by-product of solving those problems. Its unique combination of programming language, compiler and runtime environment provides a general architecture well suited for addressing many of the concerns that have been plaguing the computing community for years.

Why Java

Easy to use: The fundamentals of Java came from a programming language called C++. Although C++ is a powerful language, it was felt to be too complex in its syntax and inadequate for all of Java's requirements. Java built on and improved the ideas of C++ to provide a programming language that was powerful and simple to use.
Reliability: Java needed to reduce the likelihood of fatal mistakes from programmer. With this in mind, Object Oriented Programming language was introduced. Once data and its manipulation were packaged together in one place. It increased Java's robustness.
JAVA (Because Java is robust (integrating both web and non web application together as a single application) and also suitable for enterprise/distributed application.
Secure: As Java was originally targeting mobile devices that would be exchanging data over networks, it was built to include a high level security.
Platform Independent: Programs needed to work regardless of the machine they were being executed on. Java was written to be portable language that doesn't care about the operating system or the hardware of the computer.

Database

The name of the database server used in this paper work is MySQL
MySQL is the world's most popular open source database for the cost effective delivery of reliable, high –performance and scalable web-based and embedded database applications.
Many of the world's largest and fastest growing organisations including Facebook, Google, adobe, Alcatel Lucent and Zappos rely on MySQL to save time and money powering their high volume web sites, business critical systems and packaged software.
Software Requirements
The software requirement for the proposed system also includes:
JVM i.e Java Virtual Machine – 1.6.0 j.r.e version
MySQL Database
Windows Server 2003 or 2008 O.S
Client : Windows XP or Windows 7
Dream Weaver

Input to the System

Input consists of elements that have entered into the system in order to be processed. The input design is greatly influenced by the need of the output and accuracy is very essential so as to produce the desired output.
Input starts from the beginning of logging in as a user using the keyboard or clicking of the mouse.

Processing of the Input

Processing is known as intermediary between the input and the output. It serves as a link between the input and the output operations of the existing system.
However, for the proposed system, inputs are supplied through forms and these data are being processed by the code behind each form. The processing also takes care of security, both authentication and authorization which includes validation of data entered into the designed forms in order to generate the most accurate output.

The Output

The output design is an important design stage which must be treated with utmost care as the targeted output will determine the type of input and the method of processing that will ensure the output process is done valedictory.
The system is designed in such a way that every input and output operation is done using forms. Since the proposed system basically involves information technology change in small / medium enterprises, all users (organization staff) of the system is able to create account and register as a user in order to allow access to the organization information.

System Deployment

Software deployment includes all of the activities that make a software system available for use.

Deployment Activities

Release: The release activity follows from the completed development process. It includes all the operations to prepare a system for assembly and transfer to the customer site.
Install and activate: Activation is the activity of starting up the executable component of software. For simple system, it involves establishing some form of command for execution. For complex systems, it should make all the supporting systems ready to use. In larger software deployments, the working copy of the software might be installed on a production server in a production environment. Other versions of the deployed software may be installed in a test environment, development environment and disaster recovery environment.
Deactivate: Deactivation is the inverse of activation, and refers to shutting down any executing components of a system. Deactivation is often required to perform other deployment activities, e.g., a software system may need to be deactivated before an update can be performed. The practice of removing infrequently used or obsolete systems from service is often referred to as application retirement or application decommissioning.
Adapt: The adaptation activity is also a process to modify a software system that has been previously installed. It differs from updating in that adaptations are initiated by local events such as changing the environment of customer site, while updating is mostly started from remote software producer.
Update: The update process replaces an earlier version of all or part of a software system with a newer release.
Built-In: Mechanisms for installing updates are built into some software systems. Automation of these update processes ranges from fully automatic to user initiated and controlled. Norton Internet Security is an example of a system with a semi-automatic method for retrieving and installing updates to both the antivirus definitions and other components of the system. Other software products provide query mechanisms for determining when updates are available.
Version tracking: Version tracking systems help the user find and

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install updates to software systems installed on PCs and local networks.

Web based version tracking systems notify the user when updates are available for software systems installed on a local system. For example: VersionTracker Pro checks software versions on a user's computer and then queries its database to see if any updates are available.

Conclusions and Recommendations

Conclusively, the importance of change management in the SMEs in Nigeria is not negligible. Both SMEs were found to practice change management but they do not give recognition to the importance of change management leveraging Information Technology.

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