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TOWARDS EFFECTIVE IMPLEMENTATION OF INTERACTIVE WEB-BASED EXTRANET SYSTEM IN NIGERIAN TERTIARY INSTITUTIONS

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ABSTRACT

The effectiveness of electronic transactions all over the world is highly contingent upon an information and communication technology infrastructure to meet the challenges of the 21st century. Hence, the current effort of Nigerian Tertiary Institutions aimed at becoming efficient in managing students' academic records. The infrastructure that allows such transactions to thrive and grow is an interactive web-based extranet system and not just a site for transactions. The infrastructure must be carefully planned and developed from the outset of Extranet modeling, particularly in a university environment. Tertiary institutions in Nigeria are faced with one form of problem or the other as a result of the manual method of keeping students' academic records. This system is associated with slow processing of students' results, transcripts generation and problem of storage space. This paper adopted an interactive web-based extranet system for effective implementation of students' academic records in Nigerian Tertiary Institutions and to close the implementation gaps and improve students' academic records access and computation online, rather than physical contacts.

INTRODUCTION

In recent development, the intranet has become a common technology in most organizations including universities. In view of this fact, most tertiary institutions in Nigeria have become accustomed to web browsers. In other words, an institution of learning could use web browsers to achieve student information and this information might not necessarily be accessed on the internet, but on a local server set up to be accessed on the site using an intranet browsers.

In order to eliminate accessibility problems, web-based extranet system was introduced and has become the most feasible solution to optimize and manipulate data. The current practice is to gather the data that is needed in an optimized extranet system, regardless of the number of different applications and different platforms that are used to generate the source data. When the infrastructure for the university academic transactions is properly developed, the result is the ability to support long term growth of Extranet systems, new applications, change to existing applications, interpretation with existing Extranet system, and so on.

Wikipedia (2013) argued that the evaluation of web-based extranet system is categorized into Extranet, Intranet and Internet. The internet is a world wide web, public accessible series of standard Internet Protocol (IP). It is a network of networks that consists of millions of smaller domestic, academic, business and government networks, which together carry various information and services, such as electronic mail, online chat, file transfer and the interlinked web pages and other resources of the World Wide Web (WWW).

In addition, an Intranet is a network that is limited in scope to a single organization or entity. But it also has limited connection to the networks of one or more others usually and not necessarily trusted organizations or entities. That is, an organization's customers may be given access to some parts of its Intranet, creating in this way an Extranet, while at the same time the customers may not be considered trusted from a security point of view. Intranets extend a private network into the internet with special provisions for access, authorization and authentication (AAA Protocol).

Further, the Extranet which is our research focus has captured world attention in recent past. In reality, the growth of internal networks based on internet technologies known as the Extranet is outpacing the growth of the global internet itself (LaMee & James, 2009). An Extranet is a private network designed for communicating information within an organization. It is similar in appearance to World Wide Web and is navigated in the same way as a website. The key difference is that access is limited to internal users only (i.e. the host organization or institution). The main function of a school Extranet for example is to make resources available to students and staff and sometimes, parents. It however requires continuous maintenance issues surrounding content, security and access needs to be managed on a full-time basis.

EXTRANET SYSTEM ISSUES

There is no contradicting the fact that the world and Nigeria in particular today experience a problematic implementation of electronic transactions. Equally true is the fact that over the years, the underlying issues have not been adequately addressed for the attainment of the objectives of electronic transactions in our tertiary institutions. This has seriously affected and still affecting the process of electronic transactions worldwide, particularly in developing countries such as Nigeria. This has elicited the reactions of many scholars with varying and often conflicting views on the fundamental issues at stake; how they can be resolved; and the

importance of such resolution in the ever changing electronic transactions using Interactive Web-based Extranet system.

1. Existing Systems

Nwamarah, (2010) argued that system analysis is the gathering and interpreting facts, diagnosing problems and using that information to recommend improvements to the systems. In other words, it is a process of collecting realistic data, understanding the processes involved, identifying problems and recommending feasible suggestions for improving the existing system functioning. The process is also involved in finding out the contributions, strengths and weaknesses of the existing system in order to achieve the establishing institutional needs and goal of the new system.

Systems do not just exist; they are planned and developed through relational components to fulfill certain objectives in the institution (Ballard, 2012). The major objectives of systems analysis are to find answers to the institution's processes, such as what is being done, how is it being done, why is it being done and how can it be improved. It is more of a thinking process and involves the creative skills of the System Analyst (SA). Hence, our attempt to give birth to a new efficient system that satisfies the current needs and goal of the user and has scope for future growth within the institutional constraints. This new approach is an interactive web-based extranet system for managing students' academic records in Nigerian institutions of learning.

The conventional approaches to managing students' academic record in our tertiary institutions lack the means of representing the needs and goal of the institutions. Our research focus is on effective implementation of an interactive web-based extranet system for optimizing the management of students' academic records in the institution. There is also no computer content in the present manual approach, especially subscribed bandwidth which is unavailable for the demands of extranet system users. Bandwidth is a major consumable in the extranet system environment and critical indicator of the sustainability of extranet system connectivity of any tertiary institution. Associated with these conventional approaches in our institutions, is slow process in producing information concerning students. The time required to get information of a particular student when needed is long as individual file has to be searched for manually. There is also the problem of storage space with the manual system because the number of students admitted yearly increases, and consequently, some files are kept in improper places due to lack of space. Since the records are manually handled in form of papers, with time, they are easily subjected to wear out and attacked by insects. The computations of results and transcripts generations are still carried out manually, irrespective of the few staff available. Hence, the need for an interactive web-based extranet system for online computation of results and improved students' academic records access in a repository database rather than physical contacts.

2. Existing Extranet Systems

There is no institution of learning that is completely centralized or completely decentralized in terms of development of information and communication technology (ICT) for electronic transactions in Nigeria as at today. The true challenge is to create a system that matches the needs and goal of the institution of learning. With reliable high-speed networks, data can be stored anywhere. But most institutions of learning do not yet have high-speed networks everywhere. In particular, connections to offices in other cities or nations can be expensive and relatively slow. Consequently, bandwidth is a crucial factor in deciding centralization issues. Interactive web-based Extranet Systems provide a solution to many of these problems.

Digital Equipment Corporation (DEC) in Nigeria, has Extranet system which offers a common user interface for many applications. It has also improved the method of publications of company materials, and provides a link to its employees around the world. Merging the intranet with the internet (<http://www.digital.com>) the organization has been able to provide product information and technical support via the web. Researchers and technical support employees can share data internally and also communicate with users outside the organization.

Extranet systems have enabled institutions of learning in Nigeria to develop closer relationship with their customers, vendor and supplier. For example, Federal Express has developed a website (<http://www.fedex.com>) which allows customers to access the federal express internal database to track packets. Users can enter their air bill number into a search engine to find out the status and location of their package.

AT and T is an organization which uses an Extranet system to manage its health and insurance information centre. Its employees can access their extranet system from home or office to manage their own benefits, to access medical program information and to fill out forms. The network applications built include integrated billing services, external news feeds, an office supply ordering system, an interface to its library services and an interface to an employee database conditioning thousands of entries.

EXTRANET SYSTEM STRATEGIES

It is no longer in doubt that a well planned and modeled extranet system plays a great role in the success of the establishing institution of learning. Although, many institutions invest in the extranet system building, but only to have their efforts met with abject failure. According to Daintry Duff (2000), this failure is due to lack of strategic planning, inadequate executive sponsorship, lean financial support, and inconsistent management content.

The Extranet system suppose to give users access to the latest news about the establishing institution, become a repository for the wealth of knowledge inside users' heads and virtually eliminate paper, saving a lot of money in printing and processing costs. An Extranet system offers content and services to the users. It may link to the Internet, but cannot be accessed by the general public. As web publishing tools proliferated, the users started cracking out the content (Bill Dykes, 2002). There were no longer consistent design templates, style guides, navigational techniques or structured databases to provide any semblance of order. Despite the failed Extranet systems in institutions of learning over the years, some shining exceptions like Hewlett – Packard Porter has proved that devoting the appropriate resources and attention to internal websites can really pay off in the form of greater efficiency, knowledge sharing, users productivity and cost savings. Here are some of many of the common pitfalls of Extranet system development in any institution and knowing what they are, can help to avoid protracted failure in the systems:

Wherever an extranet system is launched, it is easy to get caught up in all the possibilities, which is the technologies and services it will offer, what the site will look like, and how to get people to use it. Planners often overlook why they are doing so, but without, some kind of clear decision making framework that looks at how the extranet system will affect your strategic objectives, it will become a futile exercise. This framework makes the building of the extranet system a success. Over times each department or unit of the establishing institution would build its own site without central oversight, and this process is associated with chaos. Such site must also conform to basic structural and navigational guidelines. That is, the website proposal must have a site development plan that includes a value analysis of

the site's offerings, specifies the strategic business objectives and describes the content. The plan must also spell out where data will be housed, how the site will be used by the potential users and what training and retraining will be required.

Many Extranet systems fail because they do not deliver value to the users. Stale content and lack of meaningful service offerings are a big turnoff. The key to choosing the right blend of content and services is remembering the needs of the users. That is, approach what will be on the extranet system from the users' perspective, and give them things that will help them do their jobs and do not waste their time. The best way to determine the user's needs is to have a design that is focused on the user interface based on coordinator feedback. There should be sharing of knowledge and resources amongst users.

It should not be a game of hide and seek when finding information on the extranet system. Establishing institutions often complicate the employees' task of finding what they need by basing their extranet system design on their institution chart; this creates or perpetuates lack of optimal use of individual informational benefits, marketing and sales, making it difficult for employees to transact business, such as students' academic records in a university environment. Many institutions neglect to build the metric system into their extranet system. This makes it difficult for them to know what kind of content is being accessed or which tools are used. This makes the tools' strategic potential to be realized for the achievement of the set objectives.

Extranet system involves multiple departments, hence these departments need to cooperate to make the extranet system successful and governance can become easy. But most often establishing institutions delegate ownership to a single department that is ill-equipped to handle the system or split ownership among departments without a co-coordinating unit, usually ICT hub. Politically, splitting ownership is a huge mistake and frequently leads to corporate infighting and finger – pointing when something goes wrong. Hence, according to Gerald and Anderson (2004) the best architectural design of extranet system is the star network where all the departments on the networks are connected to a central computer. The central computer that provides a common connection point on the network is called the hub. That is, all data which is transferred from one computer to another in the network pass through the hub.

The most critical support for an extranet system must come from the top management. Many Nigerian institutions of learning fail to achieve this because extranet system leaders fail to communicate effectively to the management team what the extranet system will achieve. Chief Executive Officers (CEOs) can avoid this communication problem by appointing an Executive System Administrator (ESA), whose job is to probe for the concrete business value of the system and communicate it to upper management in the language they would understand. ESA should be in charge of rallying management's fiscal and strategic support. That is, rather than fearing this aspect of the Extranet system, the Executive should focus on the benefits of being able to communicate strategy and vision more directly to employees and leap at that chance to take the institution to a higher level.

IMPLEMENTATION TECHNIQUES

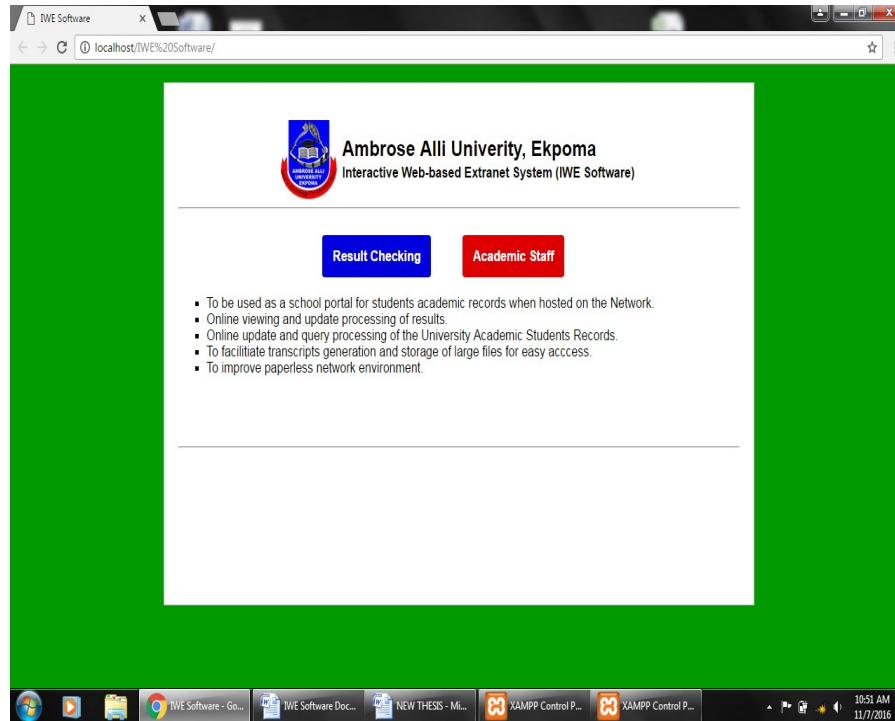
Adopting and implementing our interactive web-based Extranet System, christened "IWE" software in a university environment depict positive trends towards achieving students' results computations and publications, transcripts generations and storage of large files for easy access in the users' environment. These features were observed in the interactive implementation of our model in Ambrose Alli University, Ekpoma. The "IWE" software was

developed with the collections of web technologies, such as HTML, CSS, JavaScript, PHP, and MySQL. Hence, before our model program can be implemented, the targeted system is based on open-source technologies that can work on any operating system, such as windows and linux.

The acquisition stage of our special software involves both hardware and software development, testing of the program procedures, installation of activities and development of document. It also involves the training and retraining of the users of the new system before conversion from the old system to the new system and finally implemented. The computer hardware needed to support the minimum requirement is IBM personal computer Pentium with a clock speed of 50MHZ upward, while the software can run on a personal computer with the Intel, AMD, and Cyrix processors.

Installation process involves the transfer of installation files from the installation medium to the designated systems. Such systems must meet both stated hardware and software requirements. Before implementation of our software, the following programs/applications must be installed and configured: Apache, MySQL, and PHP. These applications can be downloaded and installed once with the help of a program called XAMPP on any operating system. XAMPP program binds together these applications for quick download, installation and configuration.

After the address has been entered in the **URL**, an authentication page display which requires a login email and password in order to use the “IWE” software appears. If invalid details have been entered, it displays an error message, else, the system will open, which displays navigation links that will lead to other pages. These include academic staff, result checking and a brief objective of the software:



SIGNIFICANCE OF EXTRANET SYSTEM IN NIGERIAN TERTIARY INSTITUTIONS

Today, Information and Communication Technology (ICT) plays a very important role in managing students' academic records in Nigerian tertiary institutions. The range of processing of students' academic records in our university environment for instance has increased as a result of improving ICT. The quality and range of electronic transactions are an important part of any institution's competitiveness in the global information world and Nigerian Tertiary Institution in particular. The tangible and intangible benefits of ICT provides to university environment cannot be over emphasized.

However, for the effective implementation of interactive web-based Extranet system in Nigerian tertiary institutions, the underlying and strategies as discussed earlier must be addressed. Analysts believe that many tertiary institutions in Nigeria invest in the extranet system building, but only to have their efforts met with abject failure. This failure is due to lack of strategic planning, inadequate executive sponsorship, Lean financial support and inconsistent management content (Daintry Duff, 2000). Despite the failed Extranet system in institutions of higher learning over the years, some shining exceptions like Hewlett-Packard Portal has proved that devoting the appropriate resources and attention to internal websites can really pay off in the form of greater efficiency, knowledge sharing, users productivity and cost effective.

CONCLUSION

Extranet system has already arrived in Nigeria, like in most developing countries today, and the number of extranet system initiatives in our university environments, for instance, is growing progressively. The issues and strategies analyzed in this paper have shown that extranet system has a key role to play in Nigerian tertiary institutions current and future development. That is, it can offer critical improvements to the efficiency and effectiveness of extranet system users' access to latest news about the institution, become a repository for the wealth of knowledge inside users' heads and virtually eliminate paper, saving a lot of money in printing and processing cost.

Many Extranet systems fail because they do not deliver value to the users, stale content and lack of meaningful service offerings are a big turnoff. The key to choosing the right blend of content and services is remembering the needs and the users. That is, approach what will be on the extranet system from the users' perspective, and give them things that will help them do their jobs and not waste time. The best way to determine the users' needs is to have a design that is focused on the users' interface based on coordinator feedback. An effective implementation of extranet system in Nigerian Tertiary Institutions is important in sharing knowledge and resources amongst users and more responsive and cost effective.

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