Ademola Adenubi (BSc (Hons) (Nigeria), MSc (UK), MNCS, MBCS)

Department of Computer Science,
College of Science & Information Technology ,
Tai Solarin University of Education, Ijagun, Ogun State, Nigeria.
email: adenubiao@tasued.edu.ng   Phone: +234 (0) 805 868 4616

28th October, 2015

The Chairman,

University Research and Learned Conferences Committee

Tai Solarin University of Education, Ijagun

Dear Sir,

PROPOSAL ON DEVELOPING A UNIVERSITY ACADEMIC MANAGEMENT SYSTEM USING THE OPEN TECHNOLOGY PLATFORMS.

Sequel to your formal request for research proposal from members of the University academic community, I hereby make a formal response to the call with this proposal on Developing a University Academic Management System Using the Open Technology Platform.

This research, which will consider the basic functional and non-functional requirements of Nigerian University academic system, particularly TASUED, to develop a working Software Solution will assist the Nigerian Universities in the seamless administration of academic activities.

The requirements and data gathering for the research will be done in the country, Nigeria, and with particular focus on Universities within Ogun State. The research, on critical review, is expected to be concluded within **Eleven (11) Months** and on a budget of **Two Million Naira (N2,000,000.00)** Only.

While appreciating this gesture of a call for research proposal with the intention to offer grant, I remain hopeful that you will find this proposal adequate and sufficient in concept and scope for consideration. Should you have further enquiry, kindly contact Mr Ademola Adenubi on 0805 868 4616 or adenubiao@tasued.edu.ng

Thanking you for the much anticipated consideration.

Yours faithfully,

Ademola Adenubi

Lead Researcher

DEVELOPING A UNIVERSITY ACADEMIC MANAGEMENT SYSTEM USING THE OPEN TECHNOLOGY PLATFORMS: TASUED IN PERSPECTIVE

Lead Researcher: Mr A.O Adenubi

Computer Science Department, COSIT

Other Researcher: Mr O.O Lewis

Physics and Telecommunications, COSIT

Mr O.J Akinsola

TASUED ICT Centre

Mr A.L Sule-Odu

TASUED ICT Centre

INTRODUCTION

The University is a systemic organ of the society with a culture of value driven performance management of teaching and learning processes. Thus, it can be argued that attaining academic excellence, which is one of the key focuses of any University, is not defined by the physical structures on Campus but by the parameters that define its administration of research, teaching and learning.

The key focus of research, teaching and learning in any University is dictated by the inter-play of activities between the Academic Staff and the Students in that University. Thus, it is of great

importance for University Administrators to deploy means and systems of managing the Teaching and Learning Activities: Course Administration and Result Processing, among others.

In this age of Computer and Information Technology, CIT, there are tools and platforms for the administration and management of these key academic activities in the Universities. These platforms are defined in the key concept of University Academic Management System; a solution for the management of academic activities for value driven performance management in teaching and learning processes.

Developing the University Academic Management System, UAMS, requires thorough research and in-depth analysis of basic functional and non-functional requirements of University major academic activities. CIT provides suitable technology platforms for this development and deployment. However, these platforms are either proprietary or open source. While the proprietary platforms are costly tools from major Software Vendors, the open source platform are free tools from the global community of volunteer developers.

This research work is to focus on the PHP/MySQL open source platforms to develop a web based, database driven, UAMS, for Nigerian Universities, particularly TASUED. The research will draw-up studies and knowledge areas in Requirement Analysis, System Design, Usability and Software Development.

REVIEW OF LITERATURE

Edger Schier (1990) was cited by (Adenuga, 2009) in defining Organisation as a planned co-ordination of the activities of a number of people for the achievement of some common explicit purposes through a hierarchy of authority and responsibility. The University, being an organisation of a sort, has people, Staff and Students, with defined roles and responsibilities working together to achieve the University goal; the goal of any University is to attain academic excellence in teaching and learning responsibilities of Staff and Students respectively.

Managing an organisation like the University in modern day reality is managing the information process flow among the key people, staff and students, within the University. Considering the key activities within the University, which centre around teaching and learning, the focus thus is on a robust academic management system that will ensure the seamless flow of academic information among Staff and Students. The UAMS is thus a form of Management Information System, which is argued to be a set of interrelated components that collect (or retrieve), process, store and distribute information to support decision making, coordination and control in an organisation (Laudon & Laudon, 2009).

At the core of the UAMS is the Technology that drives the academic information gathering, process, storage and distribution among the Staff and Students within the university. The technology platform which is offered by Computer and Information Technology, CIT, paradigm has reshaped the way Universities conduct their businesses. The key phenomenon of enabling business application over the internet is based on a fundamental technology called Distributed Computing, which offers the advantages of Higher Performance, Collaboration, Higher Reliability and Availability, Scalability, Higher Productivity and Lower Development Cycle Time, Re-Use, and Reduced Cost over the traditional stand alone applications (Nagappan, et al., 2003).

Developing the UAMS on the distributed computing framework explore the use of Client/Server architecture which allows the UAMS solution to be served from a Server machine, perhaps at the University ICT Centre, to Clients computers or Mobile devices in various hands of University Staff and Students. Thus, the UAMS is better as web application and one of the key elements of a web application is its architecture, which defines the interaction between the major components of the web application and their respective functions (Alex Homer, 2008). Web application has a series of application layers or tiers with each tier responsible for specific tasks. Possible architecture could be a single tier, two tier or three tier (also referred to as multi-tier) web application architectures. However, it is important to note that the tier represents logical divisions of the web application services and not necessarily a physical division of the software and hardware components (Anon., 2008)

Client/Server architecture for a UAMS web application has two tiers: the Application and Database layers. There have been a number of technologies for implementing the Application and the Database. While some

Web Application development tools are proprietary, e.g. Microsoft Active Server Page, others like the JAVA Server Page and the PHP are free and open source. The same applies to Database Applications. Proprietary Database management system includes Microsoft SQL and ORACLE while the MySQL is an open source Database management system. Interestingly, the database is now such an integral part of our day-to-day life that often we are not aware we are using one (Connolly & Begg, 2005)

Developing the UAMS as a 2-tier web application using the open source technology platform requires a choice on the application and database development tools to use. This research work is adopting the PHP being the web's most widely available server-side language on Apache, the software that runs 60% of web server in the World today (Powers, 2007). The PHP is used as the computer language of the web to develop the business logic of the UAMS. The other layer of the UAMS is the use of the MySQL for the database management. A major aim of database system is to provide users with an abstract view of data, hiding certain details of how data is stored and manipulated and the starting point for the design of a database must be an abstract and general description of the information requirements of the organisation that is to be represented in the database (Connolly & Begg, 2005).

Ensuring the adequacy of the information requirements for the UAMS connect the users, Staff and Students of the University, to its use. Thus, the design of the UAMS solution needs to explore and factor-in the key advantages of Human Computer Interaction, HCI, to ensure that the basic information requirements of the end-users are represented with user-friendly Graphic User Interface, GUI. HCI concept becomes relevant in the design of the UAMS as it extends users mental capabilities and enhances their intellect (Rufai, et al., 2010)

Collecting such information requirements of Universities in Nigeria for use in the development of the UAMS takes sample of Universities in Ogun State as the State occupies a central position in the Country as far as education is concerned (Oyesiku, 2009). The transformation of the information requirements of UAMS to a working model of the University requires a case study for development. The Tai Solarin University of Education is preferred for being the first of its kind in Nigeria and the 76th university to be recognised by the National University Commission (Oyesiku, 2009).

This research work will collect data on the information requirements of Nigerian Universities, with sample from Universities in Ogun State, to develop a model of a UAMS for TASUED on the open source technology using the PHP as the Scripting Language to handle the Program/Business Logic of the UAMS and the MySQL to handle the Database Management on a 2-tier web application architecture.

STATEMENT OF RESEARCH PROBLEM

UAMS is critical to ensuring the effectiveness of any University Academic System. There is the need for Universities in Nigeria, most specially, TASUED, to integrate the use of such system to enhance its academic performance.

Adopting proprietary solutions for UAMS have been counter-productive. Apart from being costly, it mostly requires additional expertise for customisation to factor-in local requirements.

Developing such UAMS with open source platforms, focusing on local requirements, control the cost and tap into the pool of knowledge of global volunteer developers, who built such scalable and effective platforms.

This research assesses the basic requirements for the development of a UAMS using the open source platforms, PHP/MySQL, with particular focus on TASUED

RESEARCH OBJECTIVE

The objective of this research is to assess and evaluate some of the basic functional and non-functional requirements for effective UAMS in Nigeria Universities, and to use these requirements to develop a UAMS with the PHP/MySQL open source platforms for TASUED as case study.

SIGNIFICANCE OF THE RESEARCH

This research work will assist Nigeria University Administrators and Software Solution Developers in Nigeria University ICT Centres to understand some of the peculiar local factors and requirements that define the UAMS suitable for the Nigerian Universities. More so, the research outcome, which is a model of a UAMS, will serve a platform for the seamless integration of the UAMS in the administration of academic activities in Nigerian Universities.

The adoption of scalability concept in the open source platform, will also map into the increasing requirements characteristics of developing Nigerian Universities.

METHODOLOGY

This research work will be architected on the framework of qualitative research methodology. Key qualitative research instruments like scheduled interviews, discussions and moderated questionnaires will be used to gather data from carefully selected focus groups from Universities within Ogun State.

The research sample space will focus on Universities in Ogun State: Tai Solarin University of Education, Olabisi Onabanjo University, Federal University of Agriculture Abeokuta, Crescent University Abeokuta, Redeemer University, The Bell University, Babcock University and Covenant University. Members of the Academic Staff, particularly, Departmental Examination Officers and Staff of Academic Planning Units, and randomly selected Students of these Universities will be selected as sample space for interview and discussion for data gathering.

The cross-referencing of the data gathered will be used to develop the UAMS model for a selected University, TASUED, to demonstrate the interpretation and use of the data collected on the requirements for UAMS for Nigerian Universities.

The methodology for the research data gathering will focus on these key factors:

- The use of various data sources

- Use of several and different researchers to collect data

- Use of multiple methods to study the research problem

- Use of different perspectives to interpret data

Consequent upon the data gathering, the research work will be designed using models and prototypes development that will be backed by user participatory approach. The user participatory design approach will be iterative and evolutionary.

Ethnographical approach, which emphasises on the respective socio-cultural considerations of the target research sample (University's Academic Staff and Students), is expected to be the core of the participatory design approach.

The development of the research outcome, UAMS, will be architected on open source technology platforms using the MySQL to handle the back-end database and the PHP to process the Scripting or Programming Logic of the UAMS.

DURATION OF PROJECT

The research project is expected to be completed in Eleven (11) months from November, 2015 to September, 2016. The time frame for the research project activities is presented below:

Research Activities	Proposed Start Period	Proposed End Period
Preparation and Submission of Proposal for Grant	October, 2015	November, 2015
Notification of Consideration/Approval for Research Grant	November, 2015	December, 2015
Schedule of Interviews with Selected Respondents	January, 2016	February, 2016
Preparation of Requirements and Specification	March, 2016	March, 2016
Recruitment and Training of Research Assistants	April, 2016	April, 2016
Development of UAMS Model	May, 2016	July, 2016
Integration of the UAMS for Pilot Testing	August, 2016	August, 2016
Report Writing	September, 2016	September, 2016

BUDGET

This research work is expected to be conducted using some computer hardware and software systems. Putting all the parameters together, the research work is expected to cost the sum of **Two Million Naira (N2,000,000.00)** Only. The breakdown of the expected budget is presented below.

S/N	Key Tasks	Sub-Tasks	Cost Implication (N)
1	Data Gathering	• Typing & Printing of Questionnaires	25, 000
		• Recruitment of 5 Research Assistants	100, 000
		• Transportations	72, 000
		• Accommodation during Interview (2wks for 2 Researchers)	100, 000
2	Software & Hardware Acquisition	• 3 pieces of Computer Laptops	300, 000
		• 1 piece of DLink Router	15, 000
		• 1 piece of 3G Modem	8, 000
		• 12 months Internet Subscriptions	180, 000
		• ADOBE Complete Web Suite (IDE)	375, 000
3	Honorarium	• 2 Research Team members	300, 000
		• 2 Research Assistants for coding	100, 000
4	Report	• Writing & preparation of Report	250, 000
		• Type-setting and printing of Report	75, 000
		• Validation of Report	100, 000
		TOTAL	**N2,000, 000.00**

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