

## **Design of a Web-Based Knowledge Sharing System for Babcock University School of Postgraduate Studies**

Baju, Kehinde Kolawole<sup>1</sup>, Babalola, Yemisi Tomilola<sup>2</sup>

*Department of Information Resources Management, School of Management Sciences, Babcock University, Nigeria*

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**ABSTRACT:** Knowledge creation remains the ultimate goal of institutions of higher education and knowledge sharing has been identified as a major instrument for achieving this goal. Web-based systems can enhance knowledge sharing in higher education institutions because they allow for discussion and interaction at any time and place as long as the users can access the systems. They also provide anonymity which encourages participants to freely share their opinions without fear of ridicule. With web-based knowledge sharing systems, users can participate in more than one discussion or forum at a time. This is in contrast with conventional knowledge sharing systems like seminars and lectures where participation is constrained by temporal and geographical limitations. Incidentally, most universities in Nigeria are yet to take advantage of the capabilities of this technology. This paper presents the design of a web-based knowledge sharing system that could serve as a platform for generating and exchanging innovative ideas among the staff and students of Babcock University. The system was built with WAMP (Windows, Apache, MySQL, PHP) and HTML. It was designed to run on Windows operating system.

**Keywords:** institutions of higher education, knowledge, knowledge management, knowledge sharing, web-based knowledge sharing systems

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### **I. INTRODUCTION**

The growing recognition of the importance of knowledge as a critical factor for innovation and wealth creation demands that higher education institutions constantly engage in knowledge creation. The postgraduate program is specifically designed to train high-level manpower who through teaching and research can create new knowledge and contribute to national development [1]. Knowledge sharing is a critical stage in knowledge creation and a core activity in postgraduate education. Expectedly, various methods including seminars, conferences, workshops and publications are employed for knowledge sharing in higher education institutions. However, most of these media require face to face interactions which may not always be convenient for students and lecturers [2]).

While conventional knowledge sharing systems require that participants gather in a location and at a particular time, web-based knowledge sharing systems allow users to interact at any time, wherever they can access the systems [3]. With web-based Knowledge Sharing Systems (KSS), users can select the topics that interest them and they can participate in more than one discussion forum at a time. The systems also offer anonymity which encourages participants to freely share their opinions without fear of ridicule [4].

Postgraduate education is an independent study where students are assumed to have the requisite skills to seek information, gather required data, analyze, reflect, discuss and publish their findings all with minimal supervision [5]). Unfortunately for some students, this high expectation is not always met as they struggle through the different stages of their research feeling isolated and frustrated. This frustration has been indicted for the high rate of attrition in postgraduate programs [6]. The need to tap into the intellectual resources of others is very high at this level of study. That is why students sometimes find themselves joining online research communities to ask questions, seek clarifications from colleagues and experts across the world using applications such as discussion forum, audio/ video chats, social networks, wikis, blogs, videoconferencing etc.

One of the goals of knowledge sharing systems is to help researchers identify experts in various fields. While using interactive online tools can be helpful in this regard, it is possible that some of the assistance they require could be available within their institutions. Dhamdhare [7] expressed concern that the fact that researchers within the same institutions may not be aware of their colleagues' expertise and research activities could have a lot of implications on research collaboration and research quality. Coertsee [8] also cautioned that most interactive online tools are built on open source software which means that they can be easily accessed and

amended by anyone. Besides, most of them are intended for social interactions and may not be adequate for academic discourse. Adaja and Awodele [9] actually found out that few Nigerian students actually use web-based platform like the Facebook for academic activities; the majority use them for social engagements. The need for institution or discipline-based knowledge sharing system that is tailored to the local needs of faculty and students is apparent. Therefore, this paper describes the process of developing the prototype of a web-based knowledge sharing system for the staff and students of Babcock University Postgraduate School.

## **II. LITERATURE REVIEW**

Knowledge is a 'blend of experience, insights, expertise, intuition and judgment that exist in the mind of the knower' [10]. It is either explicit or tacit. Explicit knowledge is knowledge that is documented in books, memos, databases, websites etc. In an academic environment, explicit knowledge might include journals, conference papers, lecture notes and manuals developed by experts over the years. Such documented knowledge can be easily stored, retrieved and shared among people. Tacit knowledge on the other hand refers to the skills, know-how, intuition, and expertise that individuals have gathered through practice, experience and exposure. It is a highly personal knowledge because it exists only in the minds of individuals. It is subconsciously understood and applied hence, it is difficult to articulate or document. Tacit knowledge is usually shared through highly interactive conversations, shared experiences, storytelling and apprenticeship [11]

Higher education institutions can optimize their knowledge resources by practicing knowledge management- the systematic and deliberate process of identifying, capturing, sharing and utilizing the ideas, skills and competencies of individuals for innovation and problem-solving. Knowledge management efforts in an academic environment will ensure that disciplinary and institutional knowledge is not lost when academics retire or leave their institutions. It facilitates knowledge preservation, transfer and reuse. A very important aspect of knowledge management that is critical to knowledge creation is knowledge sharing. Bajpal [12] described it as 'the process by which individuals collectively and iteratively refine a thought, an idea or a suggestion in the light of experiences'. Thus, knowledge sharing is an active process in which intellectual assets are exchanged, evaluated, refined and integrated to create new knowledge.

Knowledge sharing can take place within a closed or open network [13]. The closed-network model is often used to share knowledge among few individuals who have one form of relationship or the other that is built on trust such as research partners or colleagues while the open network is used to share knowledge with many people usually through a knowledge management system. Unfortunately, people are not always willing to share their knowledge because it is considered a source of competitive advantage [14]. Therefore, higher education institutions need to provide enabling environment for knowledge sharing. This includes provision of knowledge management tools to support knowledge sharing, collaboration, knowledge storage, search and retrieval [13].

Knowledge sharing in institutions of higher learning through web-based media is about bringing student, lecturers and management together in a shared "net" space for the purpose of interactions and discussion of innovative ideas. However, effort to locate knowledge sharing systems specifically designed for academic exchanges yielded very little reward as most of the knowledge sharing systems are targeted at the business rather than academic environment. Among the few knowledge sharing systems that have been designed for academic community is Refshare, a knowledge sharing tool developed at the University of Pretoria [8]. Refshare was to serve as a repository of intellectual products of the staff and post-graduate students of the Phytomedicine Programme and to support group interaction and collaboration among them. Although the system is excellent as a digital storage and retrieval system, it is not very effective for collaboration and group interaction and efforts are on-going to integrate it with Blackboard educational software in order to address its deficiencies. Also, Gavgani and Faranak [2] developed a Wiki to support interactive sessions like brainstorming and group discussion among the staff and postgraduate students of Medical Library and Information Science. They observed that students enjoyed using the Wiki for its flexibility and interactivity.

## **III. DESIGN METHODOLOGY**

The design of a system is usually precipitated by the need for the system. Therefore, a survey was carried out to establish the knowledge sharing practices of the students and faculty of Babcock university Postgraduate school. This was done to validate the need for a web-based knowledge sharing system and to create a link between the needs of the community and the proposed system. The findings showed that most of the respondents were well disposed to web-based knowledge sharing systems and share their knowledge mainly through Facebook and Twitter. Thus, the findings validated the need for a web-based, knowledge sharing system at the Babcock University School of Postgraduate studies.

The knowledge sharing system was named *Mindshare*. It is a web-based systems which means it can work with most of the popular browsers such as Internet Explorer, Google Chrome, Mozilla Firefox and Safari. The design model was based on a modified Model View Controller (MVC) framework with two main

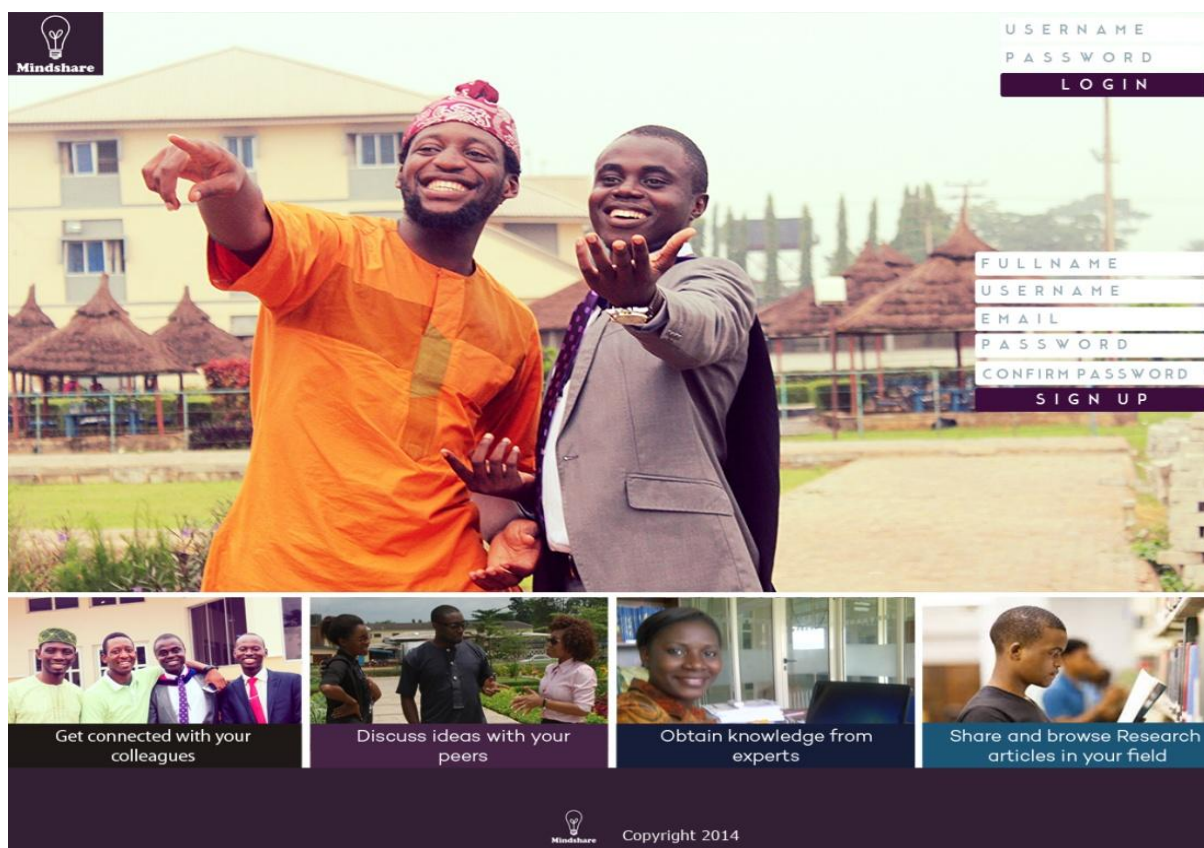
components namely:

1. **The View:** this represents the interface or the front-end of the platform through which users interact with the system. The different pages and features of the platform are made available and can be accessed by the users through a web browser. The View was designed using HTML/CSS, and AJAX so it could be dynamic, interactive and user-friendly.
2. **The Model:** this is made up of the database and controller in a single unit. The **Database** is made up of tables that store all information of the users, their discussions and interactions with other users connected to the network. It was designed with MySQL database software package. The **Controller** contains all the codes that the platform needs to execute the requests and queries sent by users. It also takes care of the security of both the database and the platform in general. It serves as the intelligent link between the database and the View. The component was programmed using PHP.

### 3.1 System Features and Function

The knowledge sharing system will enable its users to upload word or pdf documents, share them with others, start discussions and comment on other users' work. It has a search function that will allow its users to find other users on the network or their desired topic. Documents uploaded on *Mindshare* will be stored in a database and can be downloaded by users.

The system will have an online discussion forum, a database that will aid in the development of a comprehensive knowledge repository and an expert locator that will aid the staff and students of the School of Postgraduate Studies find experts in their respective fields of study. It will have four main sections: The Home, Profile, Forum and Knowledge Box.



**Figure 2:** The Welcome page of the Web-based Knowledge Sharing System

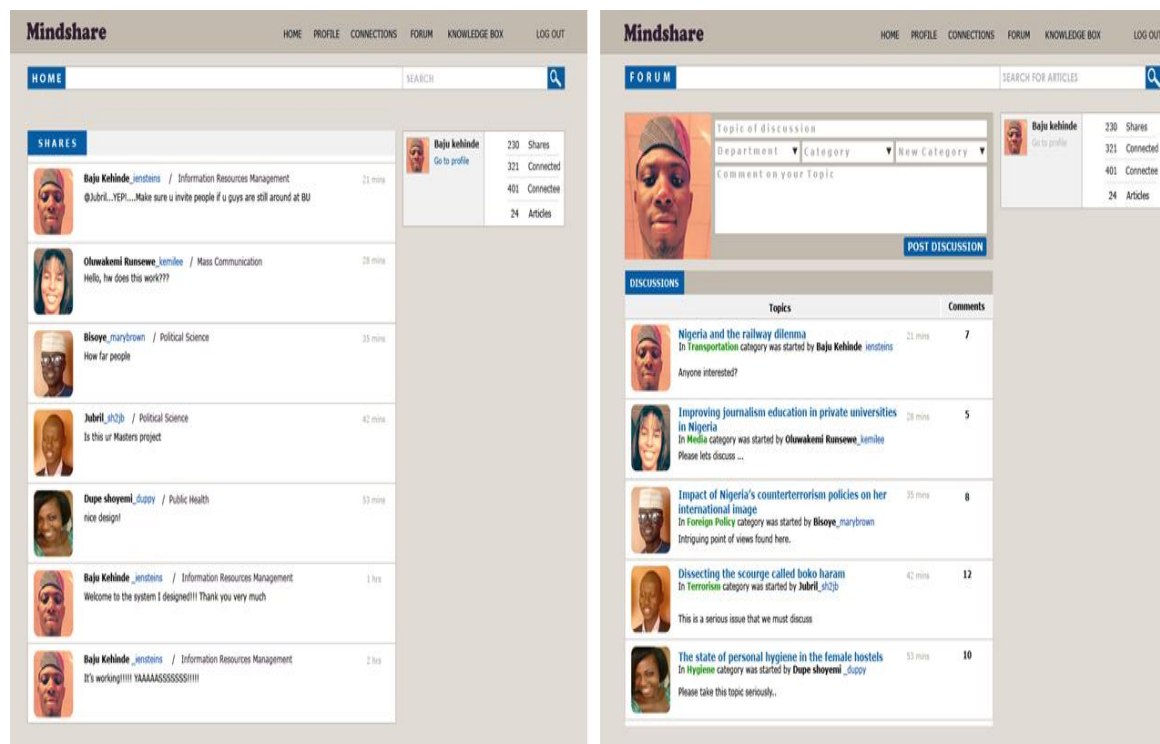


Figure 3: The Forum page of the Web-based Knowledge Sharing System

### 3.2 Testing of the Web-Based Knowledge Sharing System.

The first prototype of the web-based system was completed in May 2014. Subsequently, the testing phase was initiated. The alpha testing of Mindshare was done in May 2014. The purpose of this testing was to assess the basic capacity and functions of the system. The following objectives listed below were sought to be accomplished:

1. To test the network capabilities of the Mindshare as a web-based system.
2. To allow users to connect to the welcome page of Mindshare
3. To enable users to create their personal profiles on Mindshare
4. To give users the right to access the home page through their created profiles.
5. To allow user to post comments on the home page.

The system, was opened to fifteen (15) students of aforementioned School. After a period of testing, the following observations were noted:

1. Mindshare as a web-based system was operable as network sharing system. Which means that all fifteen (15) were connect to the Mindshare at the same time.
2. All the students involved in the testing were able to create their respective profiles and access the home page of Mindshare.

The system was only able accept only seven (7) post from the registered users. This means that some of the users were not able to use the post feature of Mindshare to post comments. These errors were discovered to be as result of the framework on which the system was developed on and the configuration of the computer system on which the system was operated upon. The second phase (Beta testing) of the system was carried out in July 2014 at the School of Postgraduate Studies (SPGS), Babcock University. The purpose of this testing was to measure the security and overall performance of the redesigned Mindshare in other to ensure that all features and functions of the web-based system performed as expected. This included testing of new features and functions added to the web-based system. A total of fifty (50) students were involved in this phase of testing for duration of one week. The observations of the testing recorded that Mindshare was able to fully accommodate the number of users that connected on its system during the duration of the testing. Some security features prevented the users from creating their profile and these features was later removed and subsequently all users where able to create their profile and log in into the network. The removal of the security feature did not make the network any less secured neither did it affect the performance of the system. The conclusion of the beta stage of testing was that Mindshare was ready for the final presentation and real-world implementation.

While the web-based system presentation signified an official end to the project, the application of the web-based system and knowledge sharing activities at Babcock University are endless. By providing a knowledge repository for storing and sharing articles as well providing a platform for discussions of various

ideas, the research activities of both the staff and students of the postgraduate community will be enhanced. Collaboration within and across departments will also become easier because it will be easier to identify experts in different fields and can use the platform to create networks of practice.

#### IV CONCLUSION AND RECOMMENDATION

Knowledge is the ingredient for innovation and the pivot of economic development. Therefore, investment in knowledge sharing media should be the primary focus of any institution that aims to contribute to national development. Babcock University is one of the foremost private universities in Nigeria and one of the few that have commenced postgraduate program. It is imperative that the university grows its knowledge base by developing a web-based knowledge sharing media. Therefore, this study recommends that:

1. Babcock University adopts and implements the web-based knowledge sharing system in order to enhance knowledge sharing within the postgraduate community.
2. all other universities develop similar web-based knowledge sharing system so as to enhance knowledge sharing within their local community.
3. the federal and state governments should support the development of knowledge management systems for specific disciplines to facilitate knowledge sharing and research collaboration within each discipline.

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