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DEVELOPMENT OF A MEDICAL STAFF RECRUITMENT SYSTEM FOR TEACHING HOSPITALS IN NIGERIA

O. O. Oluwagbemi and A. Akinsanya
Bioinformatics Unit, Department of Computer and Information Sciences, School of Natural and Applied Sciences, College of Science and Technology, Covenant University, Ota, Nigeria
Corresponding author: O. O. Oluwagbemi; E-mail: gbemiseun@yahoo.com

ABSTRACT

Recruitment of staff into teaching hospitals in Nigeria, acts as the first step towards creating competitive strength and strategic advantage for such institutions. However, one of the major problems associated with these institutions in the South Western part of Nigeria is their mode of staff recruitment. In this research paper, we developed a suitable staff recruitment system for some health institutions in Nigeria, focusing specifically on some teaching hospitals. Three teaching hospitals in south west Nigeria, were visited and relevant information was collated through personal interviews and questionnaires administration to the staff of Human Resource Departments and other relevant health professionals of these teaching hospitals. The design and development of the system employs 3-tier web architecture. System design of the staff recruitment system consisted of design activities that produce system specifications satisfying the functional requirements that were developed in the system analysis process. A formal model of the staff recruitment system was built using Unified Modeling Language (UML). The UML, as a modeling system, which provides a set of conventions that were used to describe the software system in terms of objects, offers diagrams that provide different perspective views of the system parts. The Web-based Medical Recruitment System (WBMRS) was designed to be user friendly and it is easy to navigate.

Keywords: Staff recruitment system, teaching hospitals, health institutions, Nigeria

INTRODUCTION

The healthcare sector plays a very critical role in any nation. The quality of future nurses and doctors of any nation depends on the quality of staff employed into teaching hospitals where they are trained. Recruitment and selection of staff as a systematic procedure of identifying and hiring the best qualified candidates for an organization, is the major function of the human resource department and this is the first step towards creating competitive strength and strategic advantage for such organization. One of the major problems associated with teaching hospitals in South Western part of Nigeria is their mode of staff recruitment. Some of these are evidenced in the cost associated with manual recruiting, cost of advertising using media, time wasted during response to advertisements, wastage of paper in this process and errors and bias exhibited during the selection process.

In this research paper, our aim is to develop a suitable staff recruitment system for some health institutions in Nigeria, focusing on some teaching hospitals. In achieving this, the following objectives will be pursued; to develop a system that will effectively store qualified job applicants' data in the database, schedule interviews for qualified job applicants, and the recruitment of successful and exceptional applicants after the interview process.

With the realization of this aim, recruitment of qualified and competent staff into teaching hospitals in Nigeria would be greatly improved, in terms of quality of staff, cost, time and resources invested. This will serve as a critical tool for retaining a competitive presence and enhancing predictability in a marketplace of shrinking human health resources.

MATERIALS AND METHODS

Review of relevant literatures: Several works have been done in the area of online recruitment. A review was recently conducted highlighting new challenges and strategic opportunities associated with staffing in the twenty-first century (Robert, 2006). A study also proposed architecture for a next-generation holistic e-recruiting system based on an extensive review of marketing, recruiting

and information system literatures (Eckhardt *et al.,* 2008). Another work examined the reasons behind an organization's decision to use online recruitment, through in-depth interviews and a survey of human resource managers, with recruitment responsibility, thus providing a basis for further research into how organizations may adopt online recruitment successfully (Parry and Wilson, 2009). Many years ago, a computerized recruitment program was developed for nursing administrations and its implications were considered (Patrica, 1990). Another work focused on how the Internet, as a convenient, cost-efficient, and effective employee recruitment tool, could be used to the best advantage in tapping talent for an organization (Wayne *et al.,* 2001).

Thus, the web now acts as a significant component of recruitment and job search process (Bernard *et al.,* 2005). Another study, acted as a valuable model for assessing Internet recruiting and Internet recruiting effectiveness (Robin and Gangaram, 2003). In this work, a picture of the current development of the Internet as a medium in general and as a recruitment and selection medium in particular, was presented (Bartram, 2000). A field study examined the experiences of applicant with on-line recruitment (Daniel and Brian, 2002). The effect of company recruitment web site orientation on individuals' perceptions of organizational attractiveness was also studied (Ian *et al.,* 2003).

From reviewed literature, it was observed that in the southwestern part of Nigeria, no particular work has been done and applied to teaching hospitals in the area of developing a staff recruitment system. There is therefore, the need to develop a suitable staff recruitment system, which will assist in employing quality staff into the teaching hospitals and at the same time serve as a platform where future doctors and nurses are trained and matured. This will serve as a critical tool for retaining a competitive presence, facilitating policy making and enhancing predictability in a marketplace of shrinking human health resources.

Data: In this study, three teaching hospitals in south west Nigeria, were visited and relevant information was collated through personal interviews and questionnaires administration to the staff of Human Resource Departments and other relevant health professionals of these teaching hospitals.

Architectural design of the system: The design and development of this system employs 3-tier web architecture (Figure I):

The client tier: This consists of the user interface and data access levels for the user of the system. Access methods and Graphical design is determined at this stage. All access to the system by the user is via the web browser.

The application tier: This is where the application logic is stored; application security and access methods are defined here. It usually consists of a web server (Apache, IIS, and Tomcat) and the Application logic Container (J2EE Container, PHP engine, ASP.net).

The database tier: This perhaps is the most critical aspect of the web application. It is where the user data, operational data and Meta data are stored for easy access and retrieval. All database logic and entity relationships will be defined here (SQL).

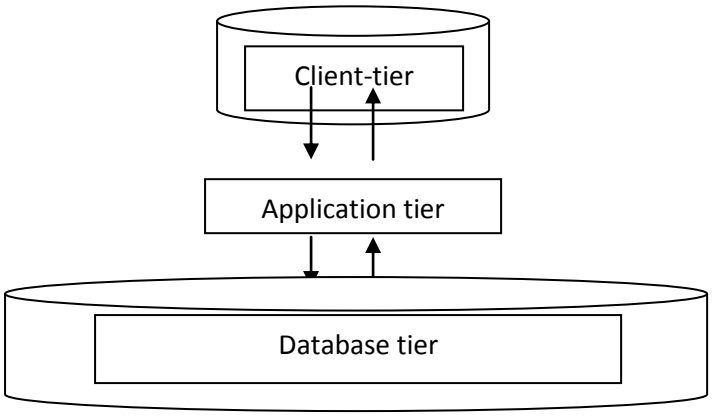

Fig. I: Architectural design of the medical staff recruitment system for teaching hospitals

System design and modeling: System design of the staff recruitment system consisted of design activities that produce system specifications satisfying the functional requirements that were

developed in the system analysis process. It is also the structural implementation, which specifies how the system will accomplish the objectives. A formal model of the staff recruitment system was built using Unified Modeling Language (UML). The UML, as a modeling system, which provides a set of conventions that were used to describe the software system in terms of objects, offers diagrams that provide different perspective views of the system parts.
The UML diagrams were listed in figures II to IV.
The Use case diagram (Figure II) was used to define the core elements and processes that make up a system. The key elements were termed as "actors" and the processes were called "use cases." The Use case diagram showed which actors interact with each use case. This defines what a use case diagram is primarily made up of—actors and use cases.
Use case diagrams define the system requirements being modeled and help write the scenarios later used in testing.

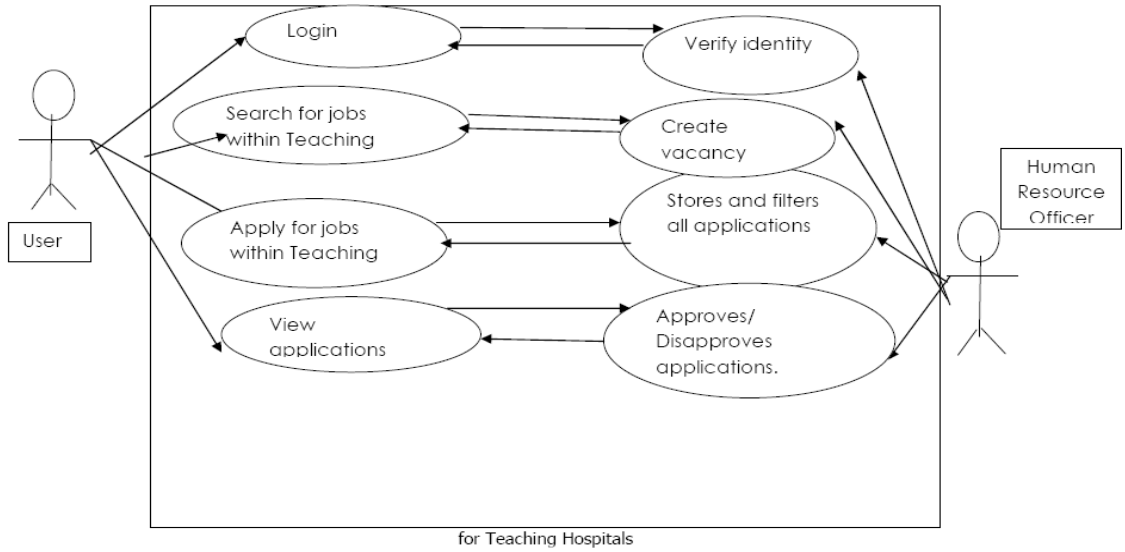

Fig. II: Use case diagram for the Web-based Medical Staff Recruitment System (WBMSRS) for Teaching Hospitals

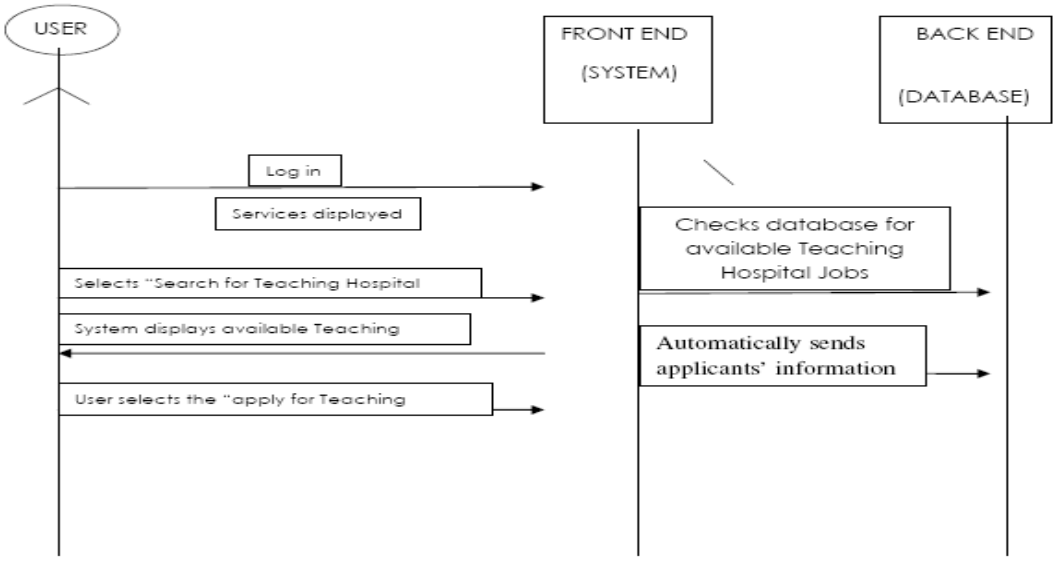

Fig. III: Sequence Diagram for the Search and Application Aspect of Teaching Hospital job

A sequence diagram (Figure III) made up of objects and messages for the WBSRS was also developed. Objects were represented exactly as they appeared in all UML diagrams—as rectangles with the underlined class name within the rectangle. Sequence diagrams are sometimes called Event-trace diagrams, event scenarios, and timing diagrams.
Activity diagrams (Figure IV) are diagram techniques showing workflows of stepwise activities and actions, with support for choice, iteration and concurrency. The activity diagram specified for the WBSRS System showed some activities that could be performed by an applicant using the system.

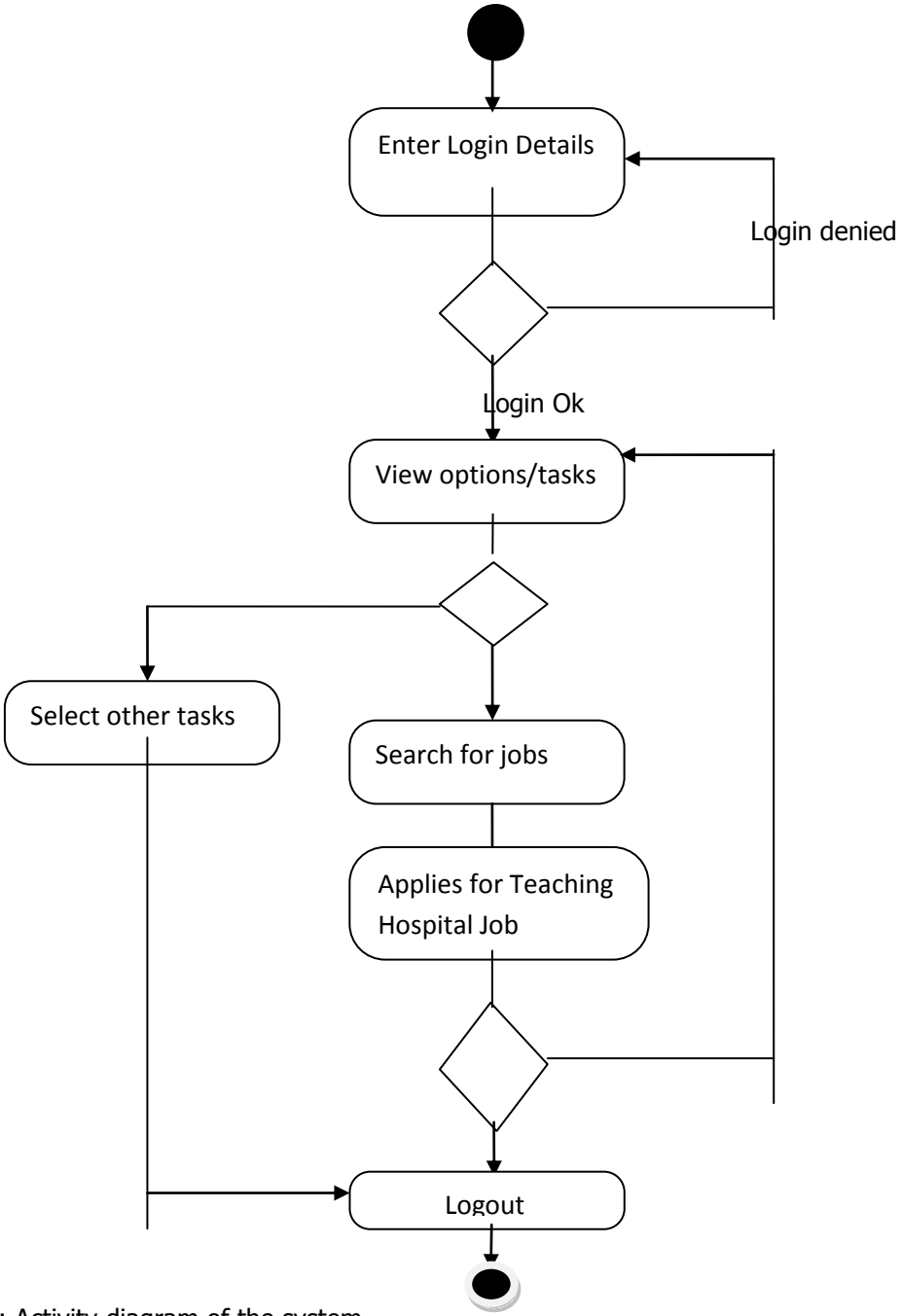

Fig. IV: Activity diagram of the system

The activities involved in the diagram were explained as follows;

(i) At start stage, the applicant logs in to the system, if login is successful he goes to the next stage else he renters his username and password

(ii) After the successful login, the systems displays all options/tasks for the user to choose from
(iii) The applicant selects the "Available Vacancies" link
(iv) The applicant applies for the desired teaching hospital job
(v) If no more tasks are to be performed, the applicant logs out of the System, else he/she performs more tasks.

Experimentation: The Web-based Medical Recruitment System (WBMRS) was designed to be user friendly and it is easy to navigate. If the viewer needs to communicate with the website, all he has to do is to click the contact hyperlink and he can communicate with it. The various modules were integrated together through a single web interface. The modules was packaged and installed on the testing server, each module having some specific requirements but generally, certain minimum specifications must be met. After these requirements have been met, the project can now be configured and implemented. The WBMRS was configured and implemented in modules. The various modules were integrated as a single web interface. The modules were packaged and installed on the testing server, with each having some specific requirements, but generally, certain minimum specifications must be met.

The tools employed in the methodology included, macromedia dream weaver (a professional HTML editor for designing, coding, and developing websites, web pages, and web applications), SWISHmax (for Creating graphics and animations), Structured Query Language (SQL) (for database creation for the website, creation of different tables, and the storage of data sent from the website). Web development was achieved by using PHP (Hypertext processor), which was used to connect the website to a database, and validate the forms to be used in the project.

Server-side installation: In order to successfully deploy the created application, software named Xamp was installed. The software contained the following the following

1. Apache 1.3 Web Server
2. MySQL Database
3. PHP 5 Scripting Engine

These software have to be manually installed on Windows Operating System. After installing Xamp you create a folder for your work in the "htdocs" folder, which serves as the local host server, and then you configure the apache server to work with PHP.

Client-side installation: For the client-side machines, the operating system web browser software was installed. Usually this is already coupled with the operating system. In windows machines, Internet explorer or Mozilla Firefox may be used.

Application installation: Once the server and client side software were installed, the On-line Recruitment package was copied into the root folder of the web server. Afterwards, the application software could be accessed through any appropriate web browser by any client machine on the LAN, WAN or Internet.

RESULTS AND DISCUSSION

Results showed some of the major programming modules implemented in the application developed for the Website. In figure V, the Registry Module worked directly with the PHP. It provided an applicant the opportunity to register and obtain a free account with the Recruitment's website. Figure VI represented the Login form**,** where users input their username and password to gain access into the website to check for new vacancies, apply online, and view all their applications.

The job applicants were expected to search for interested specific jobs they were interested in, applying for such, and submit their applications (Figure VII). In figure VIII, the medical recruitment application form works directly with the PHP. This page allows only registered job applicants to apply for any job of their choice. After the required information has been filled, it is sent to the database to allow the administrator to view and assess it. Figure IX showed the approved application page which allows the administartor to view all applications as well as to comment on them, he can either approve it or disapprove it. Figure X showed the view application page only, which only shows up after the user has logged in successfully. It allows the user to view all the post/positions that have been applied for and the administrator's comment(to see if his application has been accepted or not and the corresponding details assigned).

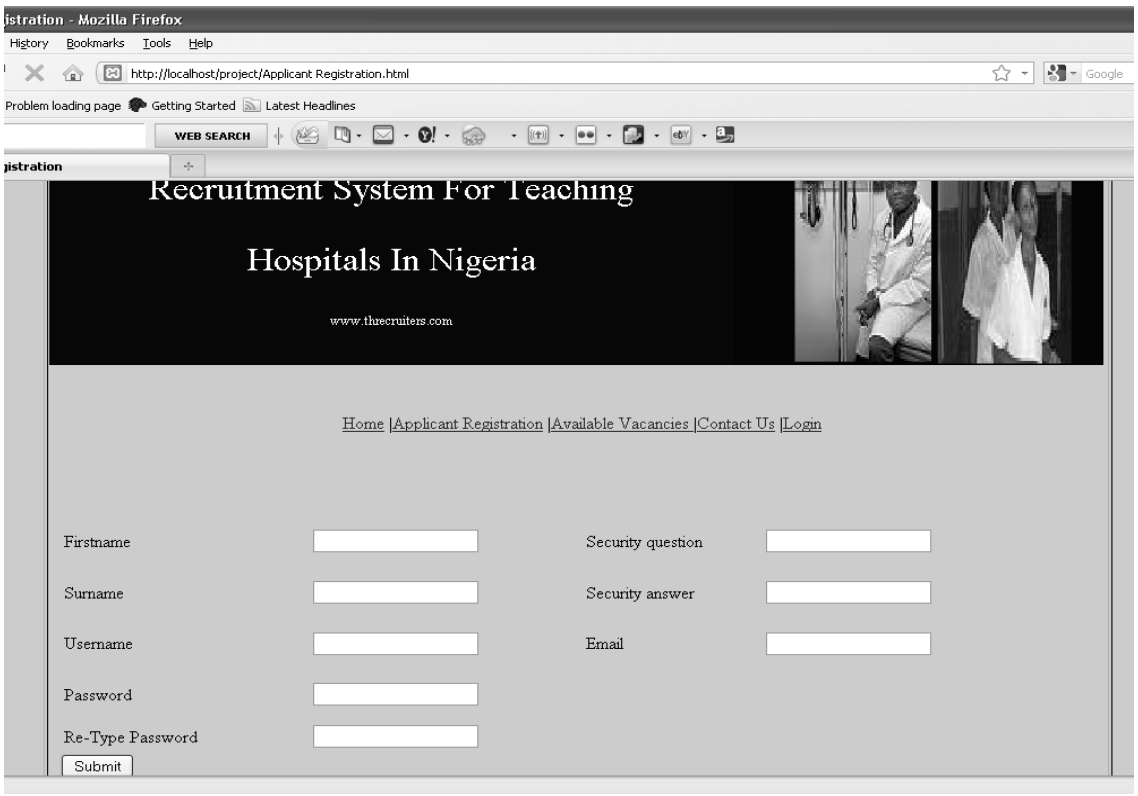

Fig. V: Registry Module

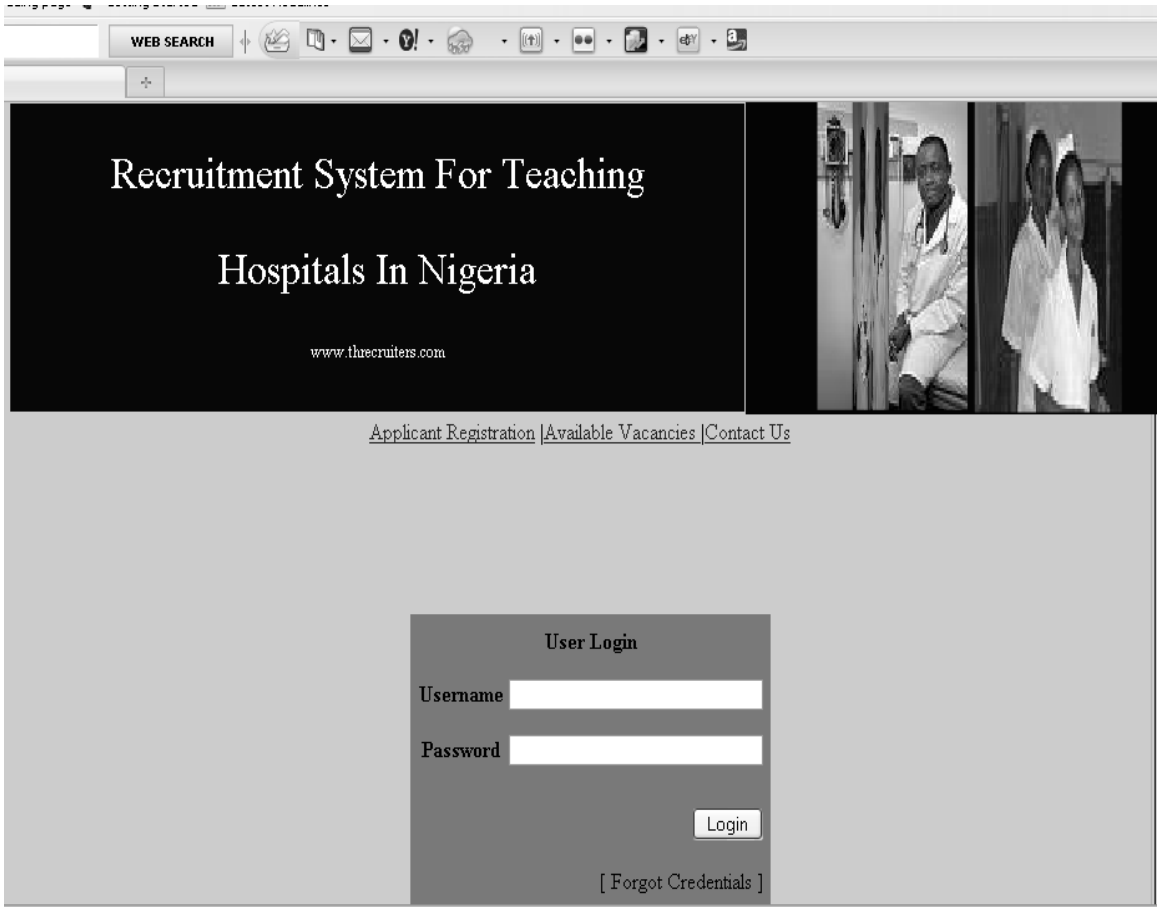

Fig. VI: Login form

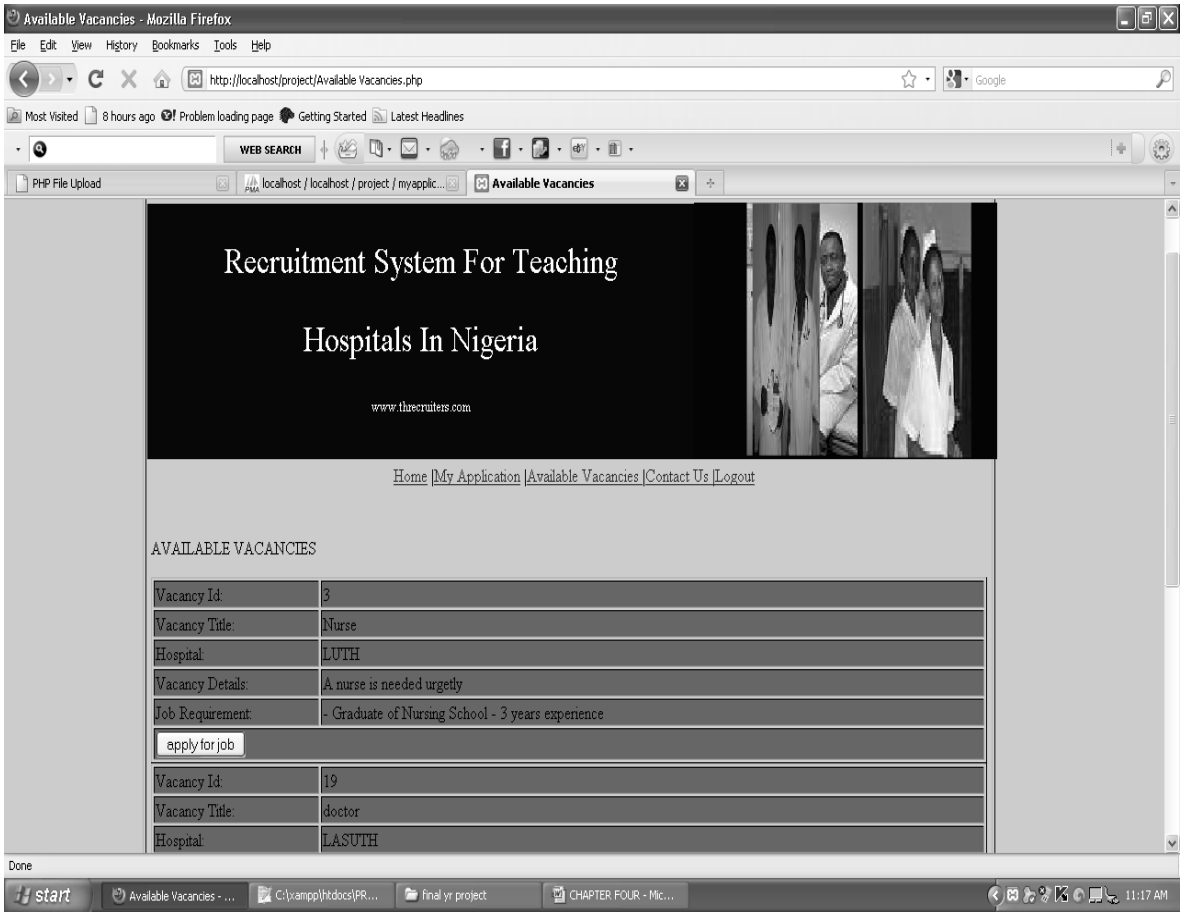

Fig. VII: This page shows all the available vacancies the admstrator has created.

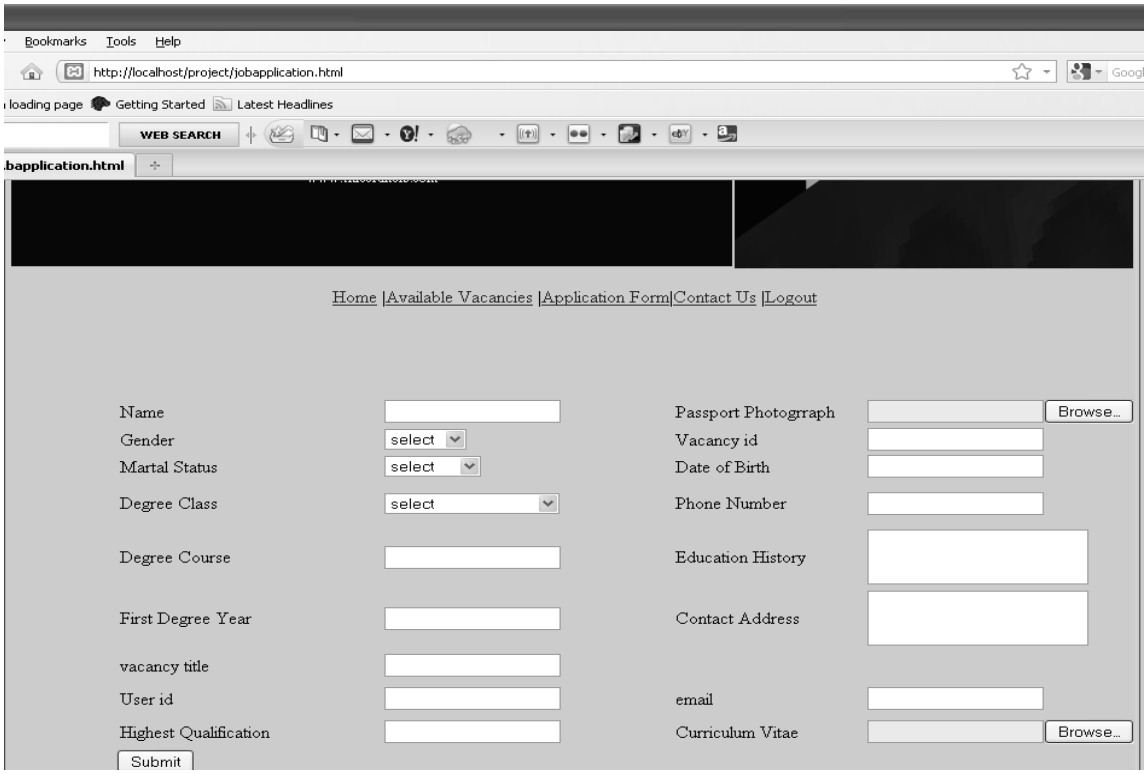

Fig. VIII. Medical Recruitment Application form

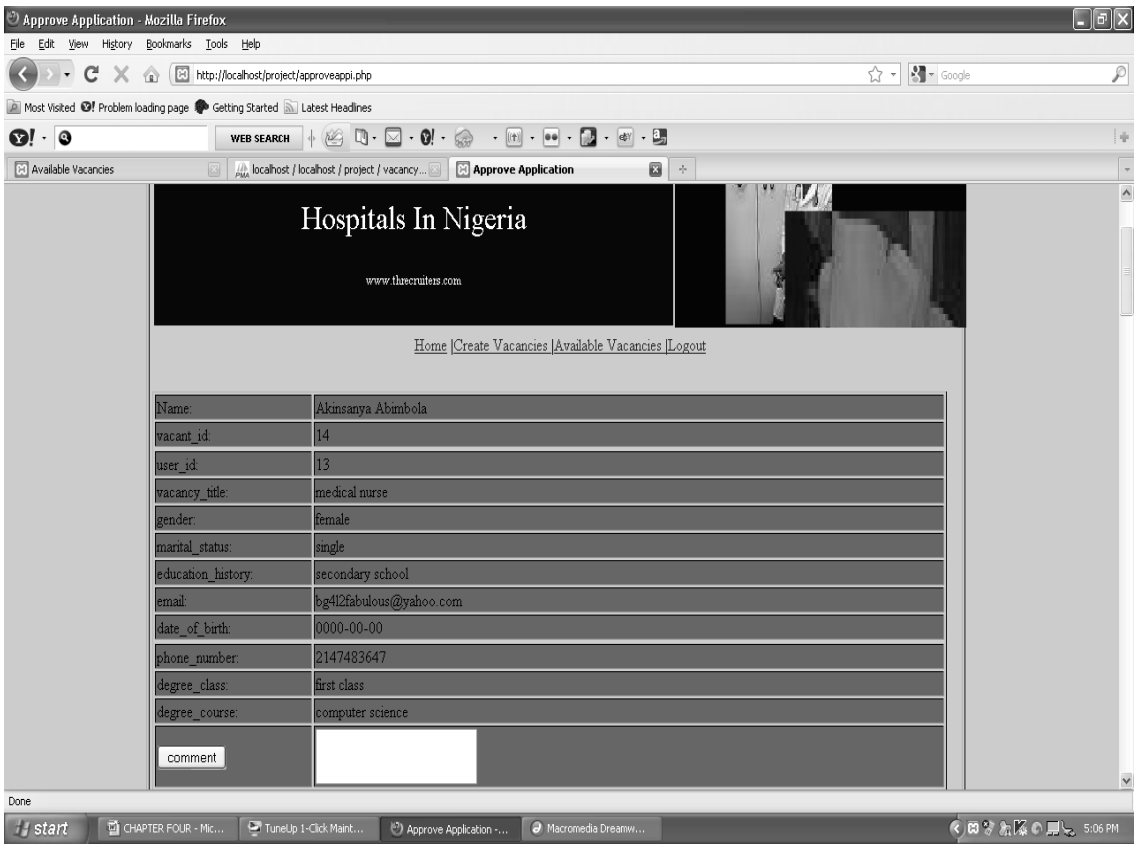

Fig. IX: The approved application page

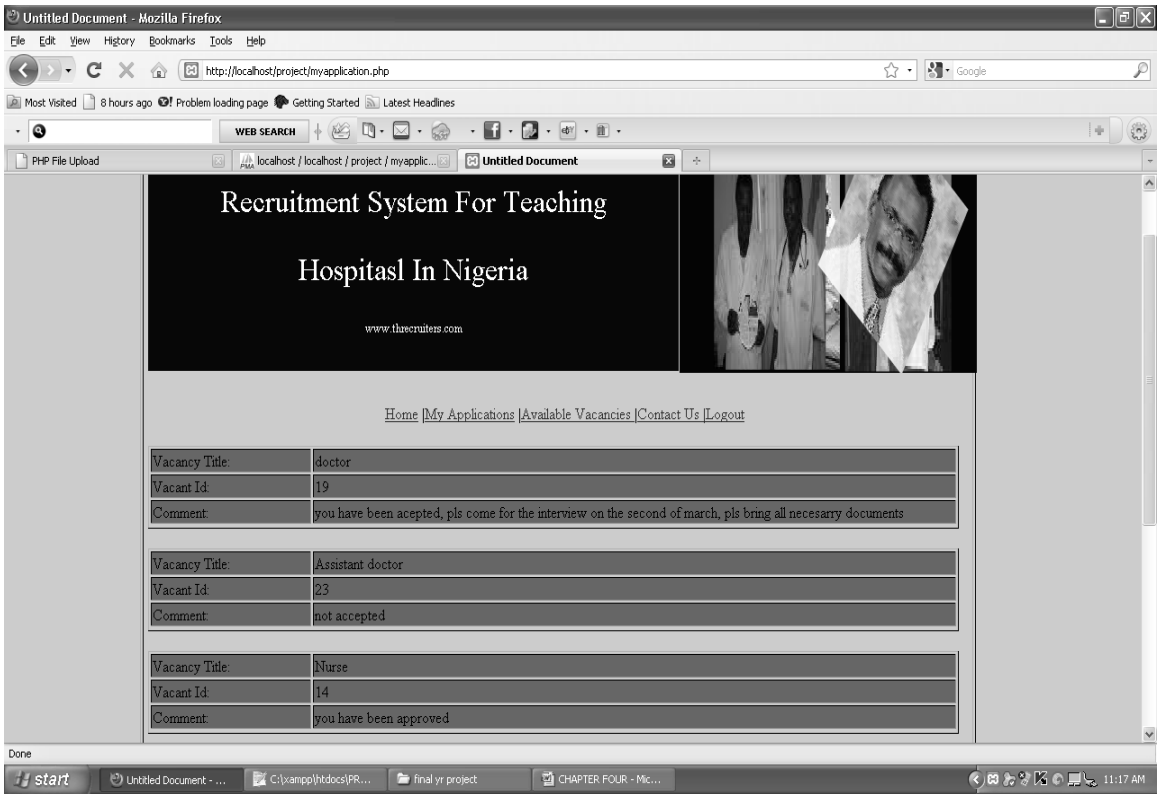

Fig. X: The view of the applications page

CONCLUSION

In our fast changing world, web-based applications are fast becoming progressively accepted. Web-based medical staff recruitment system is one of the technologically enhanced ways to recruit best medical staff into teaching hospitals in the south western part of Nigeria and Nigeria at large. The development and implementation of this tool on a large scale thus hold great promise for accommodating the health needs of the populace of Nigeria who live in cities, small towns and remote areas.

REFERENCES

Bartram, D. (2000). Internet recruitment and selection: Kissing frogs to find princes. *International Journal of Selection and Assessment,* 8(4): 261-274.

Bernard, J. J., Karen, J. J. and Amanda, S. (2005). Using the web to look for work: Implications for online job seeking and recruiting. *Journal of Internet Research,* 15(1): 49 – 66.

Daniel, C. F. and Brian, S. K. (2002). Internet job hunting: A field study of applicant experiences with on-line recruiting. *Human Resource Management Review,* 41(2): 175-192.

Eckhardt, A., Laumer S. and Tim W. (2008). Extending the architecture for a next-generation holistic e-recruiting system. *Proceedings of the 2008 International Conference on Information Resources Management (conf-IRM)*. *Proceedings Reference,* NO: 2008-971.

Garre, P. P. (1990). A computerized recruitment program. *Journal of Nursing Administration,* 20(1): **Pages?**

Ian, O., Williamson, D. P. L. and James K. (2003). The effect of company recruitment web site orientation on individuals' perceptions of organizational attractiveness. *Journal of Vocational Behavior,* 63(2): 242-263.

Parry, E. and Wilson, H. (2009). Factors influencing the adoption of online recruitment. *Personnel Review Journal,* 38(6): 655-673.

Robert, E. P. (2006). Staffing in the 21st century: New challenges and strategic opportunities. *Journal of Management, SAGE journals online,* 32(6): 868-897.

Robin, E. and Gangaram, S. (2003). Internet recruiting effectiveness: Evidence from a biomedical device firm. *International Journal of Human Resources Development and Management,* 3: 216-25.

Wayne, M. and Shane, R. P. (2001). Targeting your online employee recruitment efforts. CUPA-HR Journal Editor, 52(1): **Pages?**