

Web-Based Employees' Decision Support System for Nigerian Universities

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ABSTRACT: Most Universities in Nigeria today are faced with decision based challenges as per precise and pre-knowledge based information on employees' recruitment / retirement and proper appraisal exercise. These have resulted to improper appraising of employees due to favoritism, or employees staying and collecting salaries more than necessary. This Developed Employees Decision Support System application (EDSS) is an interactive web-based application intended to assist decision makers in the University environment identify and solve employees' recruitment and retirement related problems, complete decision process tasks, and make proper decisions. The web based application was developed using PHP, JavaScript, HTML and MySQL. Ambrose Alli University, Ekpoma, Nigeria was used as our test bed environment. The developed system was used to automate staff records; classification, evaluation and appraisal were also executed effectively and efficiently using the system. The Developed system is recommended for Universities in Nigeria and other developing countries.

Keywords: Employees', Decision Support System, Development, Appraisal, University system

1.0 INTRODUCTION

Decision Support System (DSS) is a specific class of computerized information system that supports business and organization for the purpose of decision-making activities. A properly designed Decision Support System is an interactive software-based system intended to help decision makers compile useful information from raw data, documents, personal knowledge, or business models to identify and solve problems and make decisions. A Web-based DSS is referred to as a computerized system that delivers decision support information or decision support tools to a manager, business analyst, or customer using a "thin-client" Web browser like Netscape Navigator or Internet Explorer^{[1], [2]} worked on decision support systems. This system emphasizes the what, how and why of building Web-based DSS.

For many reasons, the logical architecture to use for building contemporary decision support applications is the Internet or a corporate intranet built using Web technologies. The dominant information technology platform in companies is changing from mainframes and Local Area Network (LAN) based client-server systems to Web and Internet technologies^[3]. This technology change is expanding to what^[4] Keen (1991) called "information reach" and "information range." The reach of information and decision support systems has expanded significantly to serve any size group of internal and external stakeholders. Document-driven DSS manages, retrieve, summarize and manipulate unstructured information in a variety of electronic formats. In general, they support a decision maker by electronically keeping track of textually represented knowledge that could have a bearing on decisions^[5].

Fuzzy logic's approach to control problems mimics how a person would make decisions, much faster only. It resembles human decision making with its ability to work from approximated data and find precise solutions. According to^[6] fuzzy logic is a powerful problem solving methodology that captures the way humans represent and reason with the real-world knowledge in the face of uncertainty. Uncertainty arises due to generality, vagueness, ambiguity, chance, or incomplete knowledge. Fuzzy logic provides a simple way to draw definite conclusions from vague, ambiguous or imprecise information.

Employee evaluation is based on many parameters like classification of Commitment, Attitude, Communication Skills, Leadership qualities, Innovativeness, Responsibility, etc. These parameters are very fuzzy and not just black and white. It employs spectrum of colors, accepting that things can be partly true and partly false at the same time. Such human like approach is well implemented using fuzzy logic, which models human like decision making and common sense. Performance appraisal is a formal management system that provides for the evaluation of the full or contract staff, date of employment and expiration of employment, quality of an individual's performance in an organization. Performance appraisal has the means to evaluate an employee's current and past performance relative to the employee's performance standards. It is a process of evaluating employee's actual performance relative the standard performance so as to give feedback to the employee that will help him or her to improve the job performance.

The problem of employee decision in the institution is enormous. Both staff and management

encounter this on a daily basis. Below are some of the problems identified:

- i. Poor information retrieval system.
- ii. Payment of some staff whose contract has expired or appointment terminated due to one reason or the other.
- iii. Security issues: employees getting direct access to their files some times and records being falsified, thereby compromising the data integrity.
- iv. Difficulty in accessing staff personal status.

2.0 MATERIALS AND METHODS

We actually deployed the client and server end of this application in a University campus network environment (Ambrose Alli University, Ekpoma, Edo State, Nigeria). Data about the Employee Decision Support System (EDSS) was gathered using questionnaire and system observation. The data was fed into the developed system through an interface to capture users' information. All the logic and control between the clients and server in order to send and receive messages by routing and storage takes place within the internal software architecture of the developed system.

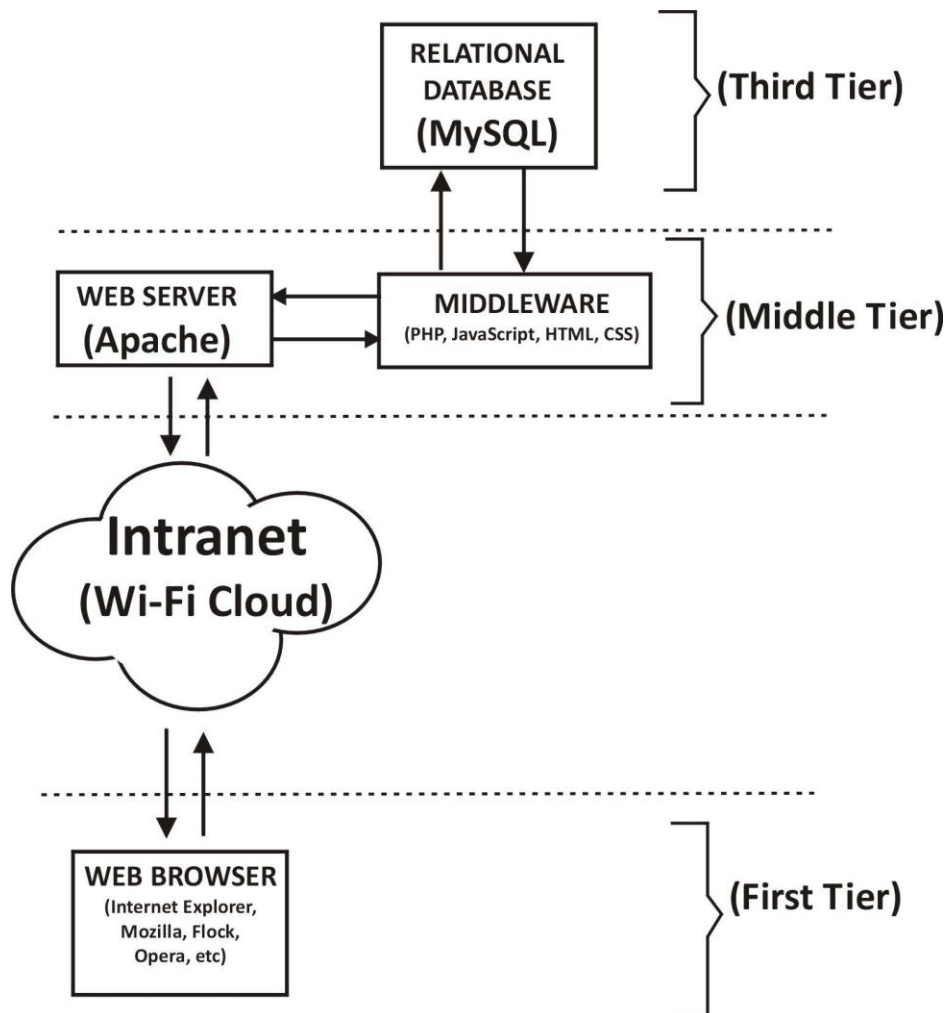


Figure 1: Web Application Architecture for the EDSS

The web works based on the client/server architecture, that is, both a central server and a client application are responsible for some amount of processing. Web applications (WebApps) are applications that are accessed with a web browser over a network such as the Internet or intranet. We structured our proposed web application as a 3-tier application. That is the web browser constitutes the first tier, a middleware engine using some dynamic web content technology such Hypertext Preprocessor (PHP), JavaScript, Hyper Text Markup Language (HTML), and Cascading Style Sheet (CSS). The database server being the third tier in which we used MySQL which is a relational database management system.

Figure 1 shows our proposed web architecture. Connection is established to the web server via the Wi-Fi Cloud using client wi-fi enabled devices. The web browser is used to make request to the web server; the web server searches the middleware engine for the information requested by the web browser, if found or not, the web server responds by returning the interrupt back to the browser which either displays the home page of the site found or it displays site not found.

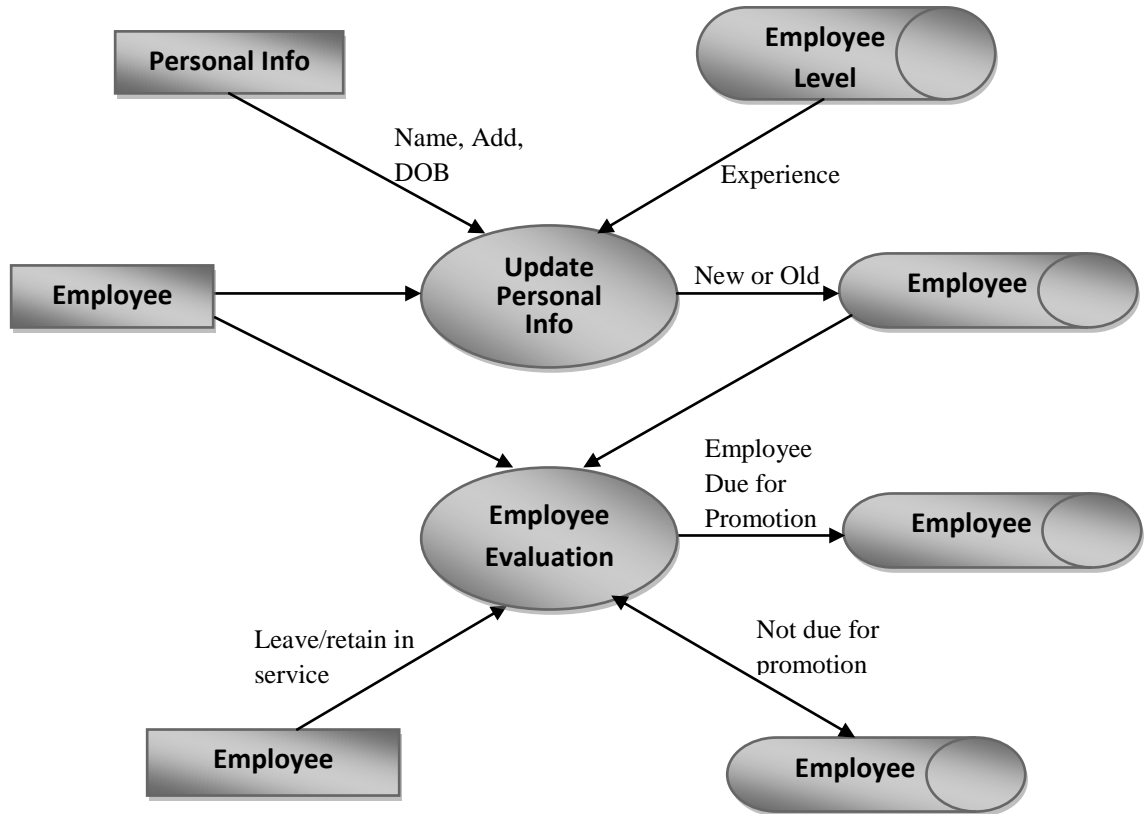


Figure 2: Employee Update and evaluation context DFD

3.0 RESULTS AND DISCUSSION

3.1 Development Tools and Environment

The system environment and development tools are listed in Table 1.

Table 1: Development tools and environment

System Hardware	Intel Core2Duo P8600 2.4GHz 4GB
System Software	O.S.: 1. Microsoft Windows XP 2. Microsoft Windows 7 Web Browser: Internet Explorer Mozilla Firefox Crazy Browser
Programming language and tools	JavaScript PHP HTML MySQL

3.2 System Test

In the experiment, we tested the system whether it can perform the following: authentication, users' rights and privileges, capture data through an interface, generate reports and so on.

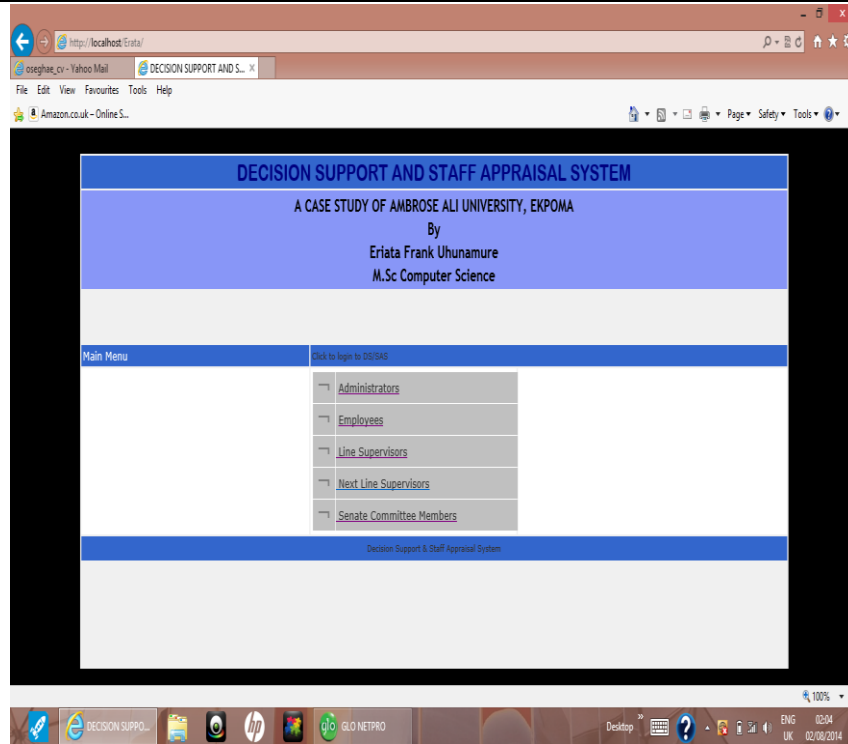


Figure 3: Developed EDSS Main Menu

Figure 3 shows the developed EDSS main menu interface. This is the first interface to be displayed whenever the developed application is launched. The EDSS application has 5 hyperlinks used by 5 different users and they are as follows: (Administrator, Employees, Line Supervisor1, Next Line Supervisor, and Senate Committee Member).

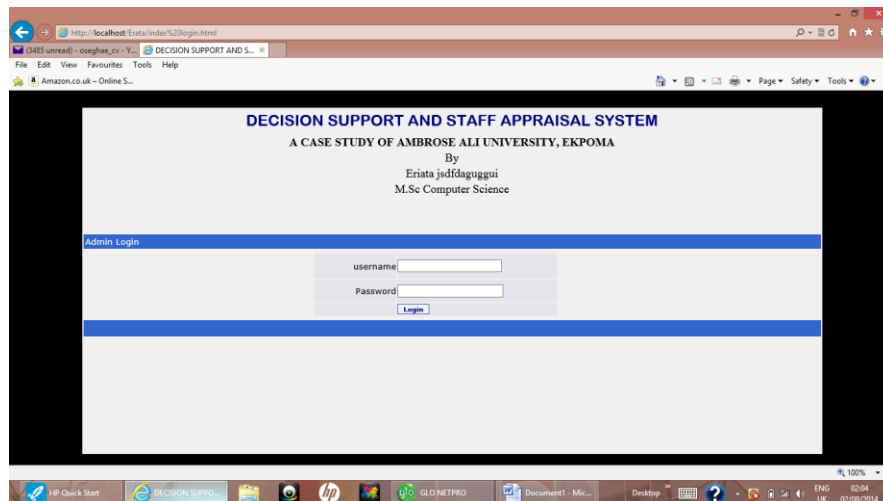


Figure 4: Users Authentication Menu

Figure 4 shows the developed EDSS authentication menu interface. This interface accepts the user's username and password for authentication and verification with the information resident in the authentication database. If it matches the system grants the user access right otherwise user is asked to try again.

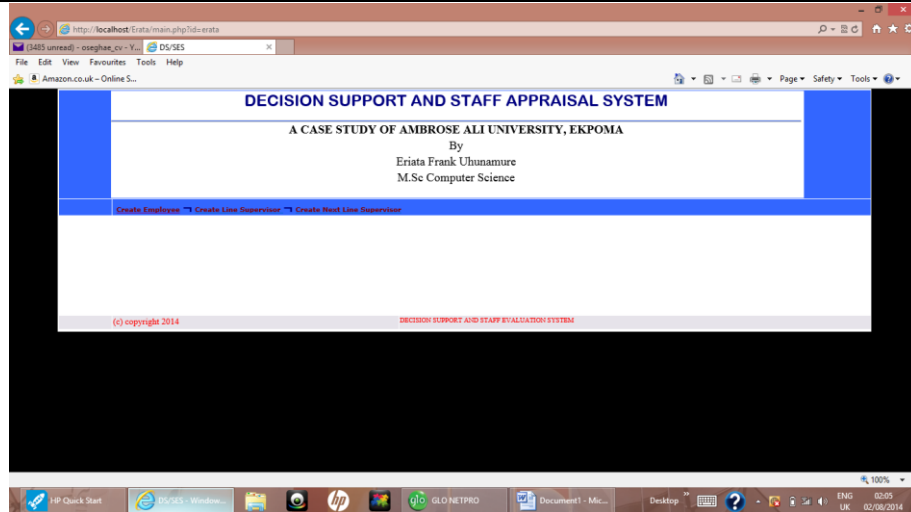


Figure 5: Users Control Panel

Figure 5 shows the developed EDSS users control panel interface. This interface helps the users to perform their various tasks.

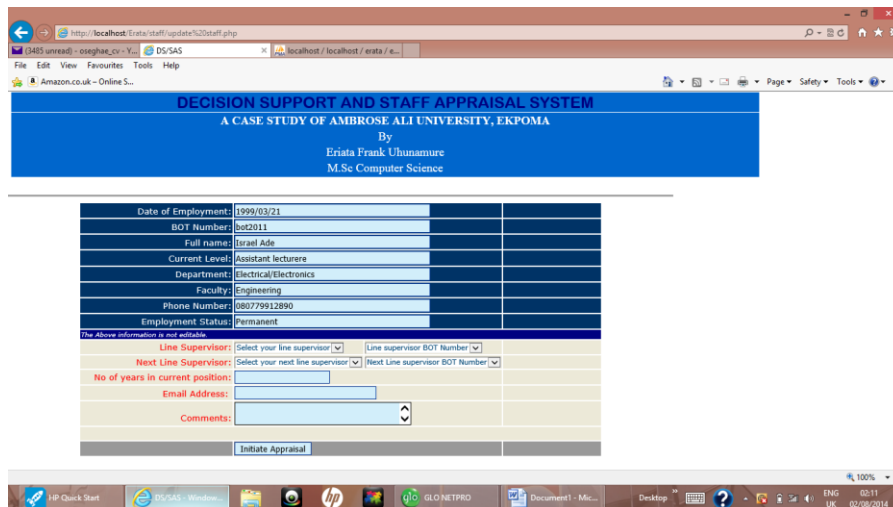


Figure 6: Data Capture Interface (Appraisal Exercise)

Figure 6 shows the developed EDSS input interface. This interface helps the user to capture the required data for appraisal exercise.

The screenshot shows a web browser window displaying the 'DECISION SUPPORT AND STAFF APPRAISAL SYSTEM' interface. The page title is 'A CASE STUDY OF AMBROSE ALI UNIVERSITY, EKPOMA' by Eriata Frank Uhanamure, M.Sc Computer Science. The form contains the following fields: Date of Employment, BOT Number, Full name, Current Level, Department, Faculty, Phone Number, Employment Status, Line Supervisor, Next Line Supervisor, No of years in current position, Email Address, and Comments. A 'Button' is located at the bottom left of the form area.

Figure 7: Data Capture Interface (Employee Profile)

Figure 7 shows the developed EDSS input data interface. This interface helps the system administrator user to capture the required data about the various employees.

4.0 CONCLUSION AND RECOMMENDATIONS

The developed Employee Decision Support System (EDSS) serve the University system effectively in terms of operations and planning levels. The benefits of the Employee Decision Support System for the University cannot be over emphasized in terms of decision quality, improved communication, cost reduction, increased productivity and improved employee satisfaction. The EDSS is a new innovation in the University system, and it is therefore recommended to be put into full operations in all Nigerian Universities.

5.0 REFERENCES

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