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EMPLOYEE LEAVE MANAGEMENT SYSTEM

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ABSTRACT

Employee leave management system combine number of processes and systems to automate and easily manage employee data, leave request, track and grant leave. In many institution staff are entitled to different types of leave, these leave are granted according to institution policy. Administrative department is mostly responsible for managing and granting leave request. To this end, most institution used conventional method of requesting, granting and managing leave. In conventional method, leave is manually request by writing letter to head of department. The head of department minutes and forward the request to higher staff for approval. This method is time consuming, prone to error, require more paper work and difficult to manage. Hence the need for an automated leave management system that is faster, error free, less paper work and easy to manage. The system was achieved by developing an automated employee leave management system using the three tier software architectural model. The System is implemented using web based technologies which include CSS, JS, HTML, MySQL, PHP and runs on Windows operating system. Performance evaluation of usability, conveniences and speed of developed system was compared with existing method using 150 staff. The results shows that 94% of responded agreed that the developed system is easy to use, 95% agreed that is most convenient and 98% agreed that it can deliver service in timely manner. The overall functionality of the system shows that it work satisfactory and the result obtained shows that the system is error free, faster and allows staff to request for leave in a timely manner. Hence the system can be used by both academic staff and administrative department of an institution for effective and efficient management of employee leave.

Keywords: Employee, Leave Management System, Leave Request, Institution

INTRODUCTION

An employee leave management system is a platform that enables staff and admin of an organization or institution to easily apply, correctly allocate, track and grant leave (Chugh, 2014). In many institutions, staff are entitle to different kind of leave; study leave, sick leave, annual leave, leave without pay, research leave and maternity leave. These leave are been taken and recorded according to institution policy. The administrative department is mostly considered as one of the most important assets in every institution. It is a part of administrative department function to keep all the records of employee. Every institution administrative department is information driven, and the admin staff drives and carry out day to day activities. In most institutions, conventional method of requesting and managing leave is been used. In conventional method, academic staff is required to manually write and submit leave application to administrative department through the Head of Department (HOD). The head of department minutes and forward the request to higher staff in charge, who approve or reject the request. This method is time consuming, prone to error, required more paper work and tedious to maintain. Hence the need for an automated method that is faster, error free, with no paper work and easy to manage. Employee leave management is a web based application that can be easily accessible by staff

and management of an institution. It makes it easy for an employee to request and track their own leave. Administrative department of an institution on the other hand can easily allocate, grant and manage all leave requests. Employee leave management system automatically reflect the request to the relevant superior officer for approval. If the superior officers reject the leave, a reason for rejecting the leave must be entered into the system and the employee who requested the leave will be notified and if the leave request requires a higher superior officer for approval before notifying the employee, the respective officer will be notified. The system will also notify other members of staff that are required to know. This will enable administrative department to administer leave or note to the next applicant, to track and manage the employee leave. For every leave requested by an employee, the system will automatically deduct the applicant leave from total leave and notify all parties involve the total leave taken, the remaining balance and when next the leave will be taken according to policy of an institution. Several literatures exists in leave management system; Hridita, et al., (2018) documents an internship report on leave management system but due to time factor, confidentiality of organizational data and resources limitation, only few details of the system were described. Mishal et al., (2017) developed an intranet based leave management system that can be

accessed within an organization. The system can be used to request, approve and generates reports of leave but only on works on intranet. Manish et al., (2015) developed leave and pay roll management system for requesting, viewing of history and granting/rejecting of leave request. Rushitha et al., (2019) developed android based leave management system for effective and efficient management of staff leave request and approval/rejection. Although the system can manage staff leave efficiently, it can only work on android operating system platform as such cannot be used as web based application. Isaac et al., (2018) developed prototyped of cloud based employee management information system for African small and medium enterprises consisting of four modules; leave management, payroll management, staff appraisal and record management. Though the system was designed to cover all aspect of human resources in African small and medium enterprises, only prototype of the proposed system was developed at the time of carrying out this research. Vikrant et al., (2017) developed an intranet based student leave management system that automates the work flow of leave approval and rejection. Stephen et al., (2018) developed algorithm for scheduling leave in Nigeria university system for academic staff. The system processes service delivery by determining staff mix by rank and lecture-to- student ratio. Due to the drawback of the existing research aforementioned, this paper presents employee management system specifically for managing staff leave with simplicity, conveniences and ease of use by both academic and non academic staff of an institution. The system serves as improvement in staff management, maintain accuracy, transparency and highlight

the need to integrate advance technology in employee record and welfare management in higher institution.

MATERIALS AND METHOD

Employee leave management system is designed using three tier architecture model because of its performance, horizontal scalability and each part of the tier can be develop concurrently by different programmers, coding with different programming languages. The three tier architecture runs on client/server model and the web server. Tier one also known as presentation tier consists of the client, display the Graphical User interface (GUI) designed using Hyper Text Markup language (HTML), Cascading Style Sheet (CSS) and Java script. All HTML forms or content which displayed on client browser are all in tier one. The CSS is deployed through a web browser which communicates with business tier and data through Application Program Interface (API) calls. Tier two which is the middle and also known as business logic tier is made up of application server designed using java programming language and web server. It contains the business logic and performs the actual processing of data and communicates with the data tier. Tier three which is the data tier is designed using MySQL and consists of method and classes which deal with storing and passing of data to the database (storage layer). Search procedures or queries are used to access the data and other operations in the database. Data passed by presentation tier are also stored in the database and manages all read and write to the database. The architecture of the three tier architecture and the use case diagram of the software application is shown in Figure 1 and 2 respectively.

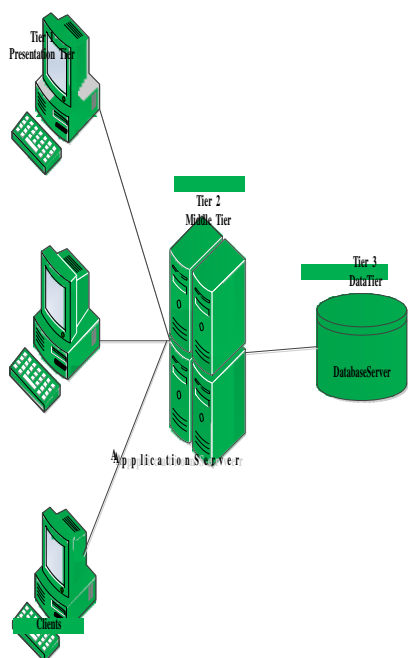


Figure 1: Three Tier Diagram of the System



Figure 2: Use Case Diagram of System

Figure 1 shows the components of the three tier architecture; the presentation tier, the application tier and data tier. The application tier bridges gap between the underlying database and user interface hiding technical details from the users. It interacts with the database by retrieving and storing data, and communicates with the presentation tier. Apart from receiving and translating of data, it also dispatches and gives feedback to both presentation and data tier. The application tier also uses sets of rules to interpret request coming from the presentation tier (user interface) into actions. The data tier is responsible for storing needed information, optimization of data access and modeling of the system. The data tier also house the data needed by the application tier and stored information needed by the entire system to carry out some functions. The System is implemented using web based technologies which include CSS, JS, HTML, MySQL, PHP and runs on Windows operating system. HTML coupled with CSS and JavaScript were used for developing graphical user interface and form validation. HTML specifies the layout and style of the documents which creates the information been displayed in the pages. The CSS improves the look and feel by separating layout such as color and fonts of document contents which helps to provide more control, flexibility in

specification and accessibility of the content. The JS enable ease of communication asynchronously between the clients, interprets its source code, and executes scripts step by step and control the browser documents content. PHP is used for the total programming of the system. When an employee invokes a leave request after successful login into the system, web server sends the request to PHP to access the required data from the database. The web server controls the retrieval and request of all information. The minimum hardware requirement depicted in Figure 1, include network of computers with Intel P4 or equivalent multi processor, 4GB RAM and 100 GB hard disk capacity for clients side. A minimum of 2x1.6 GHz CPU processor, 3.5 GB RAM and 80 GB hard disk capacity for the basic medium virtual machine configuration of the web server.

RESULT AND DISCUSSION

The login form is the first graphical user interface displayed when the employee leave management application is launch. Figure 3 shows the home page of employee leave management system, staff and admin can log in using staff number as user name and an eight digit password of their choice.

The screenshot displays the user interface of the CSC LEAVE MANAGEMENT SYSTEM. At the top, a blue navigation bar contains the system's name. Below this, a white section with a light blue border serves as the main content area. It features a welcome message and a sidebar with navigation links. The primary focus is the 'EMPLOYEE LOGIN' form, which includes text boxes for 'Employee ID' and 'Password', and a prominent green 'Sign in' button.

Figure 3: Home Page of Employee Leave management System Showing Admin and Staff Login

The first stage require admin to login into the system using his/her user name and password, then create all users according to their hierarchy as shown in figure 4.

Figure 4: Creating Users on Employee Management System by Admin

When a staff login into the system for the first time, he/she will be required to change the password before any request can be carried out. After successfully login in with the new password, user can navigates to the next page as shown in figure 5.

Figure 5: User Leave Request Page on Employee Leave Management System

Figure 5 shows the leave request page on employee leave management system, staff is required to select type of leave, enter start date and end date from the drop down menu. Staff can also add additional information using the remark portion of the page. After completing the form, the staff is required to submit the request by clicking of the request leave button. After successful submission, the leave request automatically reflect on the superior officers account for approval or rejection as shown in Figure 6.

Employee ID	Duration	Description	Status	
Oduh31217	1 week	Family Commitments	ON-HOLD	Respond
Doe16263	2 weeks	Travel Leave	REJECTED	Respond

Figure 6: Superior Officers Page for Approving or Rejecting Leave Request

If the superior officer rejects the leave, a reason for rejecting the leave must be entered and the applicant will be notified. If the leave requires a higher superior officer for approval before notifying the employee or members of staff in the same department, the add notification button can be used to select the superior officers and department to be notified.

PERFORMANCE EVALUATION

This work was compared with conventional method of employee leave management system. The system was tested and compared with the manual method, evaluated for speed, usability and conveniences for efficient management of staff leave through the perception of assessments of these qualities by both academic and non academic staff of Ibrahim Badamasi Babangida University (IBBU) Lapai. Data were collected inform of questionnaire after responded used the manual method of employee leave management and the developed leave management system. A well structured questionnaire to assess the Speed, usability and conveniences factors were administered to each respondents. A total of 150 questionnaires were distributed to both academic and non academic staff of Ibrahim Badamasi Babangida University (IBBU) Lapai for assessing the manual method and the developed system for requesting, generating report and approval/rejection of leave requests using speed, usability and conveniences to influence the assertion that the developed system have capacity to efficiently manage staff leave in conveniently and timely manner than the existing method. Three performance evaluation metrics; speed, usability and conveniences were measured and the results are shown in Table 1 and figure 7.

Table 1: Users Perception on Manual Method and Developed Employee Leave Management System

User Perception	Manual Method	Developed System
1. Usability	6% of responded agreed that the manual method is easy to use	94% of respondent agreed that the developed system is easy to use
2. Conveniences	5% of responded agreed that the manual method is most convenient	95% of respondent agreed that the developed system is the most Convenient
3. Speed	2% of responded agreed the manual method is faster	98% of respondent agreed that the developed system can deliver service in efficient and timely manner

Findings from usability revealed that 94% of respondent agreed that the developed system is easy to use compared to the existing method as shown in Table 1 and Figure 7. 98% of respondents agreed that the system can deliver service in timely manner compared to the existing system. The findings of convenience assessments revealed that 95% agreed that the developed

system offers convenience service to both academic and non academic staff of the university compared to the existing method.

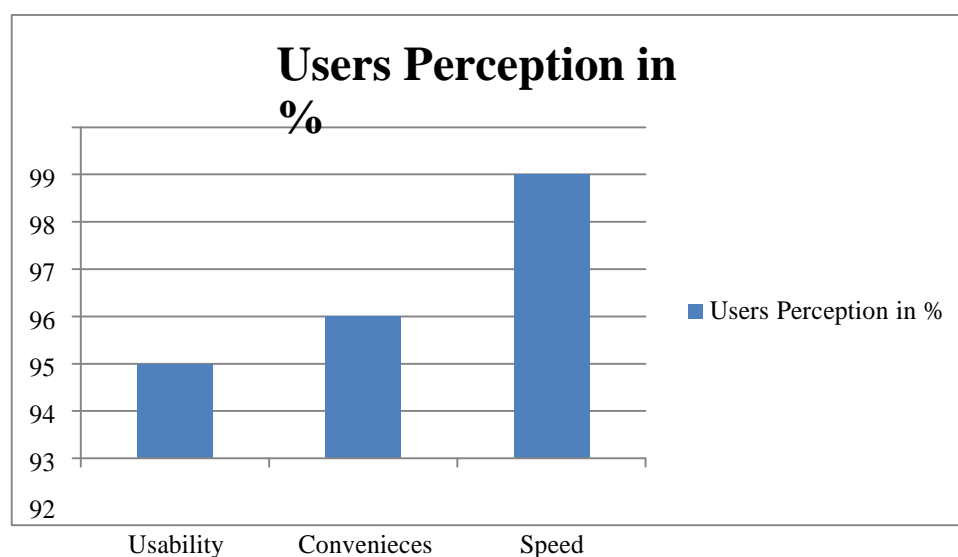


Figure 7: Users Perception on Employee Management System

CONCLUSION AND RECOMMENDATION

Employee leave management system for managing staff leave in higher institution has successfully been developed. The system was developed in line with three tier architecture software model and implemented using web based technologies which include CSS, JS, HTML, MySQL. The system serves as improvement in staff management, maintain accuracy, transparency and highlight the need to integrate advance technology in employee record and welfare management in higher institution. The developed system enables the employees in academic institutions to request and track their leave at their own convenient time in timely manner. Superior officers of the institution and administrative department can create leave policies, check transparency and plan activities ahead of time. Further researchers can integrate Unstructured Supplementary Service Data (USSD) into the System to manage employees leave and emergency welfare.

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