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Automated Employee Tracking Solution for Enhanced Workforce Management - A Case Study of The University of Benin, Benin City, Nigeria

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ABSTRACT

This research paper is focused on the development of an Employee Tracking System for the staff of the Department of Computer Science, University of Benin (UNIBEN). The system was developed to monitor and manage staff information, attendance, departmental roles, and daily activity logs. Adopting the Waterfall Model as the software development methodology, the system was built through sequential phases including requirement analysis, system design, implementation, testing, and deployment. The application was implemented using PHP as the server-side programming language, while **MySQL** served as the backend database for storing and managing staff records. The system provided a secure login interface for administrators and staff. Once logged in, staff could view and update their profiles, while administrators had privileges to add new staff, track daily attendance, assign roles, and generate activity reports. The system worked by allowing staff to check in and out using a time-stamping mechanism, which automatically recorded login and logout times. All attendance and activity logs were stored in the MySQL database. The administrator dashboard displayed real-time data, including active staff, absence records, and role-based performance summaries. Reports could be exported for departmental review and decision-making. By digitizing manual processes, the developed system significantly improved administrative efficiency, reduced paperwork, and enhanced transparency and accountability within the department. The integration of PHP and MySQL ensured a reliable, responsive, and scalable solution tailored to the specific needs of the department. Overall, the project demonstrated the effective use of web technologies to streamline human resource and activity management in an academic environment.

Keyword: Employee, Tracking, Integration, Dashboard, Mechanism, Waterfall Model, Workers

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I. INTRODUCTION

Effective staff management is essential for achieving institutional goals in universities. However, many institutions still rely on manual processes for tracking employee attendance and performance, leading to inefficiencies, fraudulent practices, and reduced productivity.

Challenges such as poor record-keeping, difficulty in monitoring staff activities, and lack of real-time data hinder decision-making and organizational growth. Manual systems like paper-based timebooks are especially inadequate in large institutions, where tracking attendance, scheduling tasks, and updating staff records can become tedious and error-prone. Issues such as proxy sign-ins and unauthorized absences further highlight the need for automated solutions. As noted by Etuk and Onwuachu (2016), maintaining large volumes of employee data manually is unsustainable and inefficient in today's digital age. To address these challenges, this study proposes the development of an employee tracking system for the Department of Computer Science at the University of Benin (UNIBEN).

The system will automate staff registration, task scheduling, attendance tracking, and data reporting. Real-time technologies such as RFID, GPS, and 3G networks will be utilized to enhance monitoring and ensure transparency. While digital systems offer improved efficiency and streamlined workflows, privacy and data security remain critical concerns. Therefore, the proposed system will incorporate access controls and data protection measures to address ethical and legal implications associated with staff monitoring. By transitioning from manual processes to a digital tracking system, the department can enhance operational efficiency, ensure accountability, and support informed decision-making ultimately contributing to the university's strategic development.

RELATED LITERATURE

Sonal et al (2016) examined Employee Tracking and Monitoring System using devices such as Android with varying security features. Making use of special database and is capable of retrieving data from a main database with a different specifications for employees as they resume duty.

Frayer (2002) noted further that the System allows departmental heads to access employee's office cell phone. Incoming, and outgoing calls, text messages, emails and al manner of multimedia messages can be accessed and cut short by the boss, because they are able to view staff whereabouts, how often they visit such places, get alerts all movements to approved areas, be aware texts, calls or emails from unpermitted contacts. Relatedly, Shermin et al (2015), revealed the methods employee are now tracked via devices such as smart location, based time and attendance system all embedded in applications found in Smartphone. Such Smartphone prevent running the app via finger print scanner, in which case the company's location can be access GPS which could be employed in tracking employees.

Ashwini et al. (2015), worked on Employee Monitoring System using Android Smartphone. In their study all activities such as incoming, outgoing, missed call, SMS log, internet browsing history, data usage, banned call website list all are saved on remote server from where managers view such data after logging in remote server. These enable employers to map out the location of their employee's via GPS. All employee venturing otside the premises automatically transmit an alert message to the manager.

This enables them to analyzed the employee attitude to work and general behavior by conduct during working hours (unauthorized calls data usage all will translate to good/bad/average/loyal). The facilitating device given to all employees must be android based device for the system to work. But it not necessary for managers to use same (android device), in their own case, any device may suffice.

Another scholar, Kalyani et al (2015) worked on employee monitoring system using android smart phone. Their study covered the design and implementation of three key areas of monitoring systems that is: admin application, employee application and Centralized server for monitored company employee's using android technology. This system provides special database utility that retrieves data or information from central database. The app in a smart device has all the important data regarding an employee's phone usage such as: SMS and call logs, locations, data usage, internet browsing history, and approved versus unapproved data usage. Also all manner of interaction emanating from the staff phone to the admin are via 3G network technology.

3. SYSTEM DESIGN AND DEVELOPMENT

System Description

This new system is structured to work with the standard software development procedure. In order to achieve effective employee tracking system, Waterfall Design Methodology was used. This is because it is an internationally accepted software engineering model mainly used in most scheduling and management oriented analysis and design.

The Proposed System

When a labour schedule or task is created with proper time allocation, it is submitted online, an automated program will be used to determine the name and staff that has been schedule for that task which is being assign. The purpose of this method is to expedite the labour scheduling and time management process. However, there are significant practical implications which arise from the automated process. After submitting a schedule or task to be performed online, staff will go online to check the task which has been assign to them. The online system will provide a reason and permit the staff to check their work time and the level they are to teach as stipulated in the system work time-table. The proposed system will eliminate some of the constraint on the existing system like delay in reporting work done etc, this will in a long way provide a more efficient and effective labour scheduling and time management, and reduces the stress of doing the formal.

The proposed system also take attendance records of the staff daily and capture the time the staff come to work and the time the staff close as will be shown in a time book. Use case diagram is made up of graphic notations showing the interactions among the elements of a system. It is a methodology used in system analysis, to identify, clarify, and organize system requirements. Figure.1 shows the various ways staff and the administrators interact with the online tracking system;

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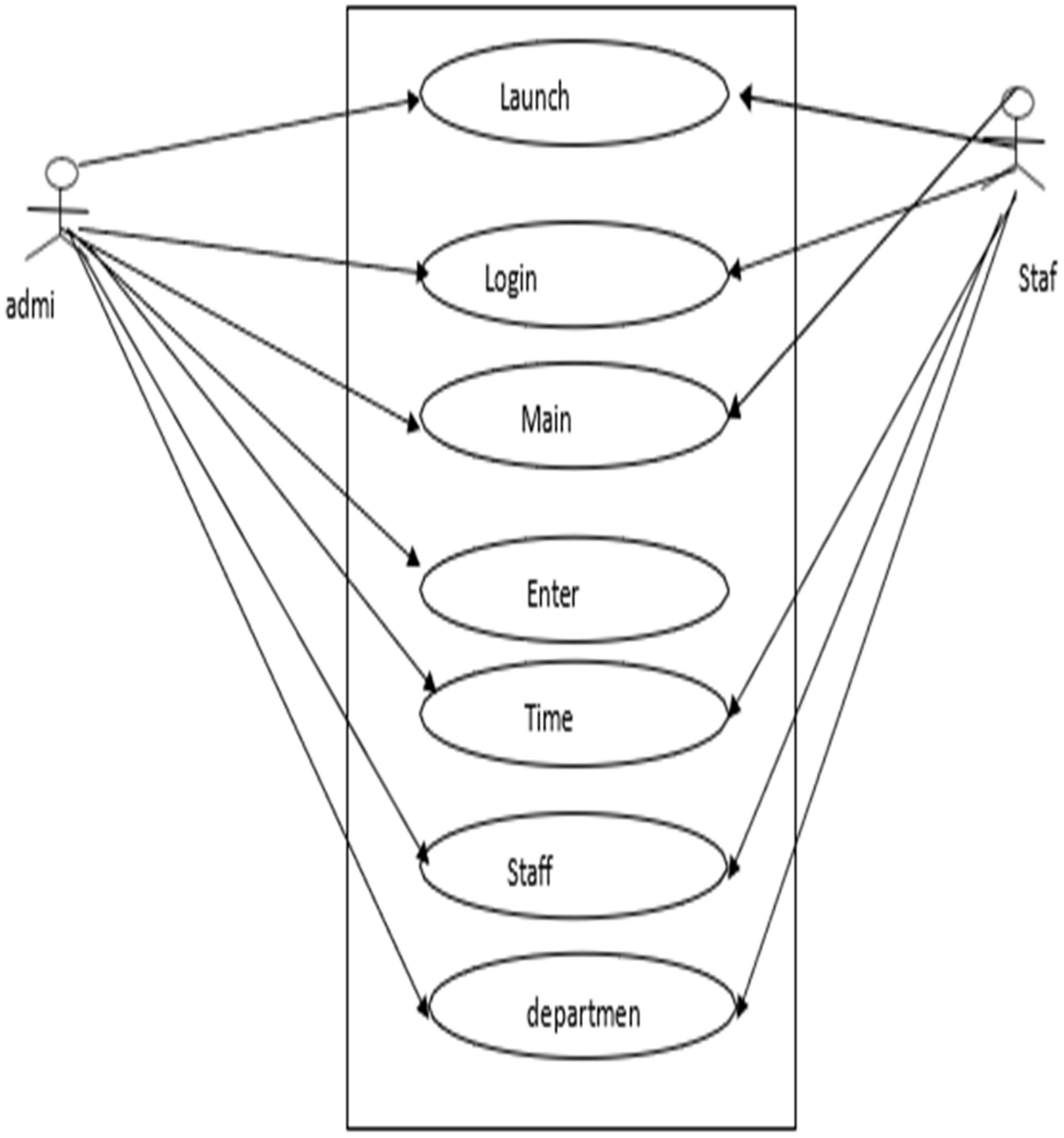

Figure .1 Use case diagram of the proposed system

An Activity Diagram in Unified Modeling Language is a graphical representation of an executed set of instruction showing the system activities and considered a state chart diagram variation. Figure 2. shows the activity diagram displaying how connection is established:

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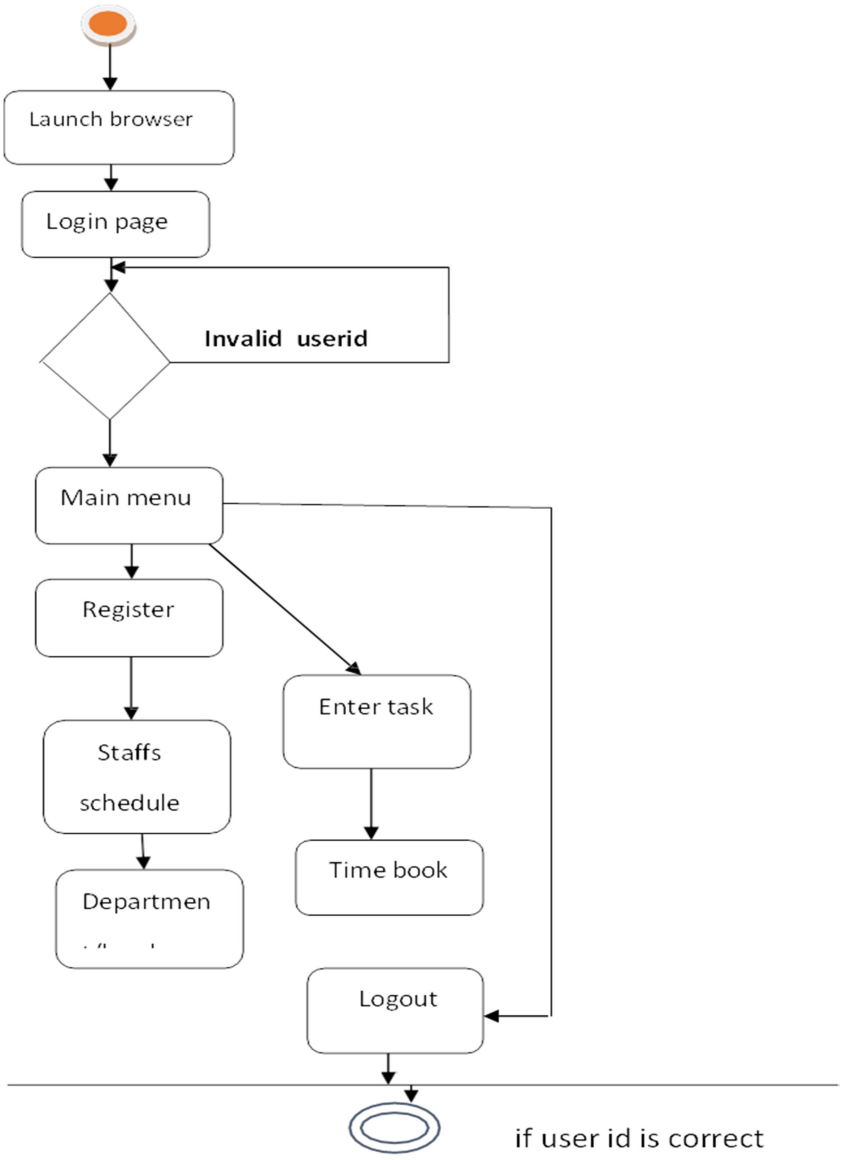

Figure 2: Activity Diagram of the Proposed System

Sequence diagrams show a detailed flow for a specific use case or even just part of a specific use case. It also describes how to a particular class method is implemented. A sequence diagram has two dimensions: The vertical dimension shows the sequence of messages/calls in the time order that they occur; the horizontal dimension shows the object instances to which the messages are sent. Figure 3 on the next page shows the flow of the implementation of the use case diagram

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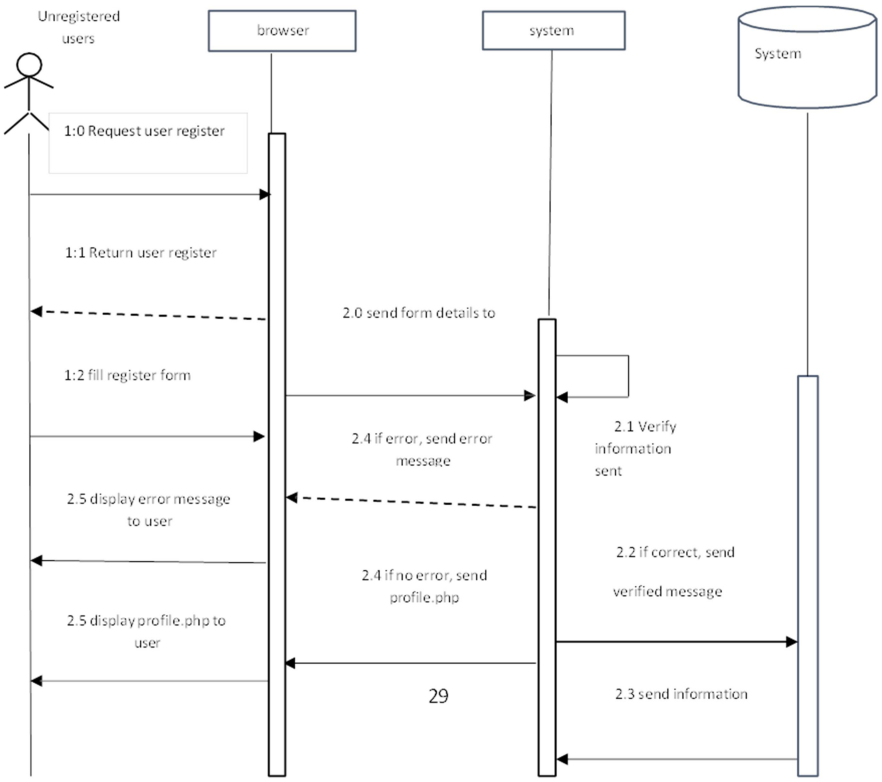

Figure 3.: Sequential diagram of the proposed system

System Implementation

Figure 4. shows the Login page where the admin/staff login to the system

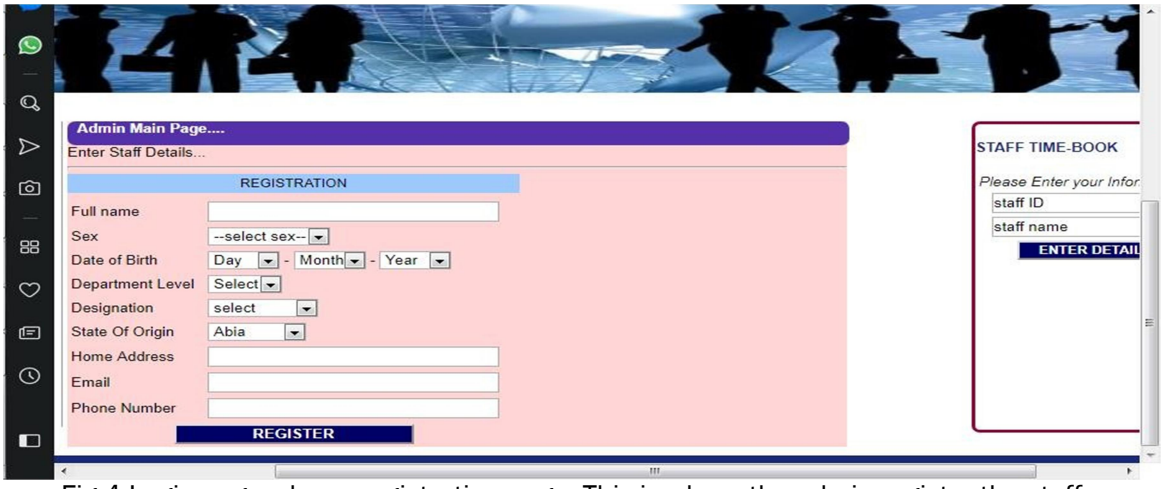

Fig 4 Login page. shows registration page. This is where the admin register the staffs.

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Figure 5. shows the Schedule staff page, this is where the admin schedule staffs on duty

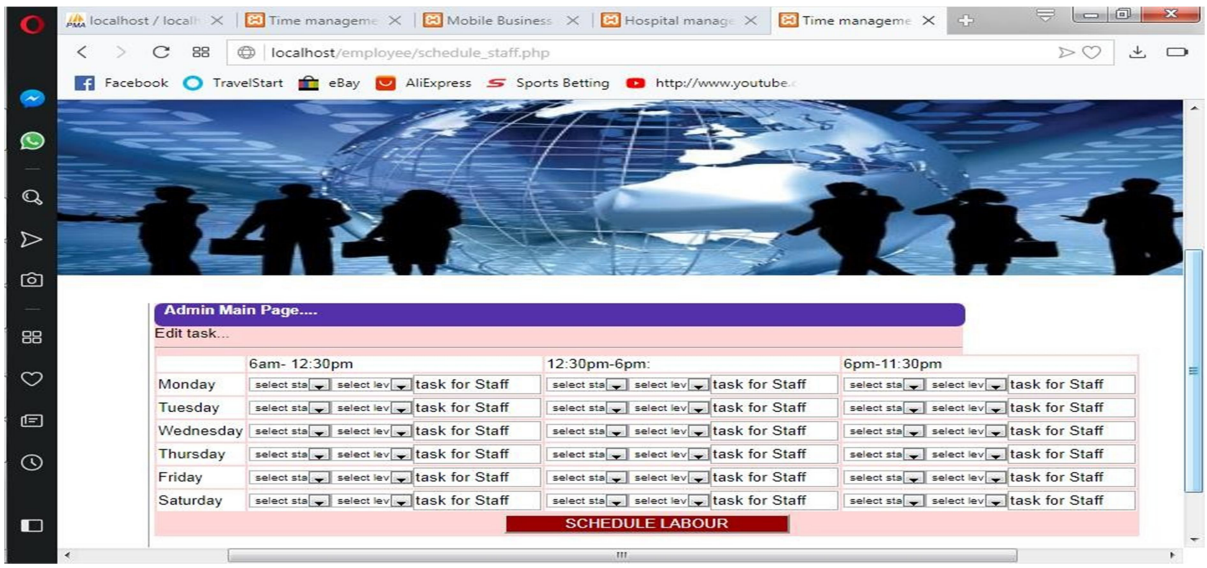

Figure 5. shows the Schedule staff page, this is where the admin schedule staffs on duty

Figure 6. shows the time book page i.e. the system shows the time the staff comes to work and the time the staff left work.

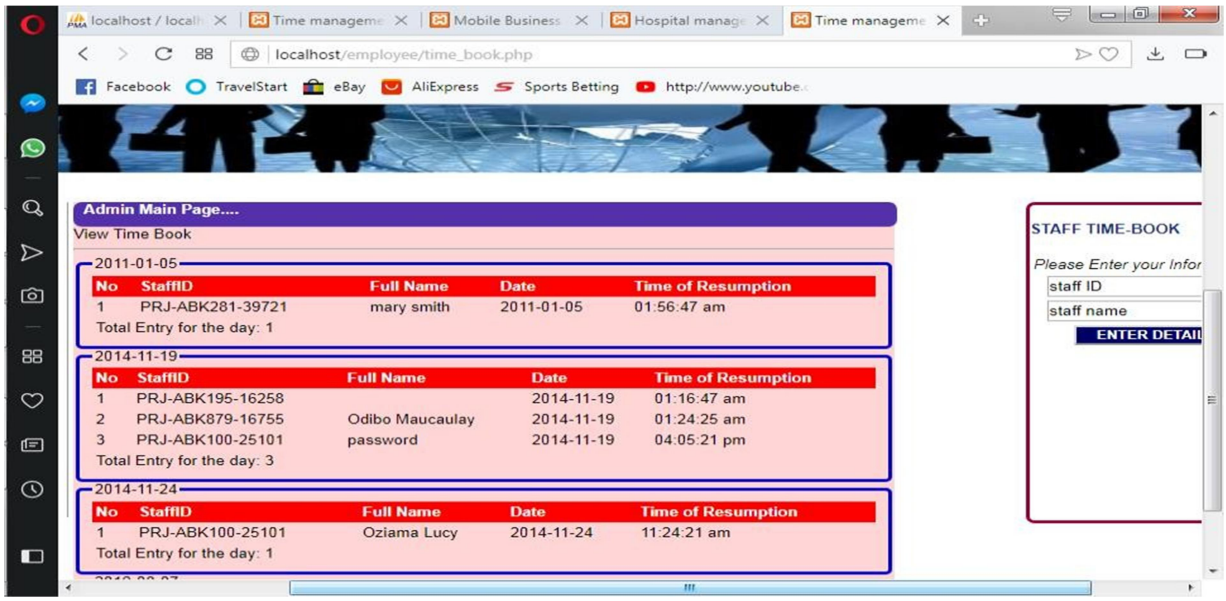

Figure 6 Time book

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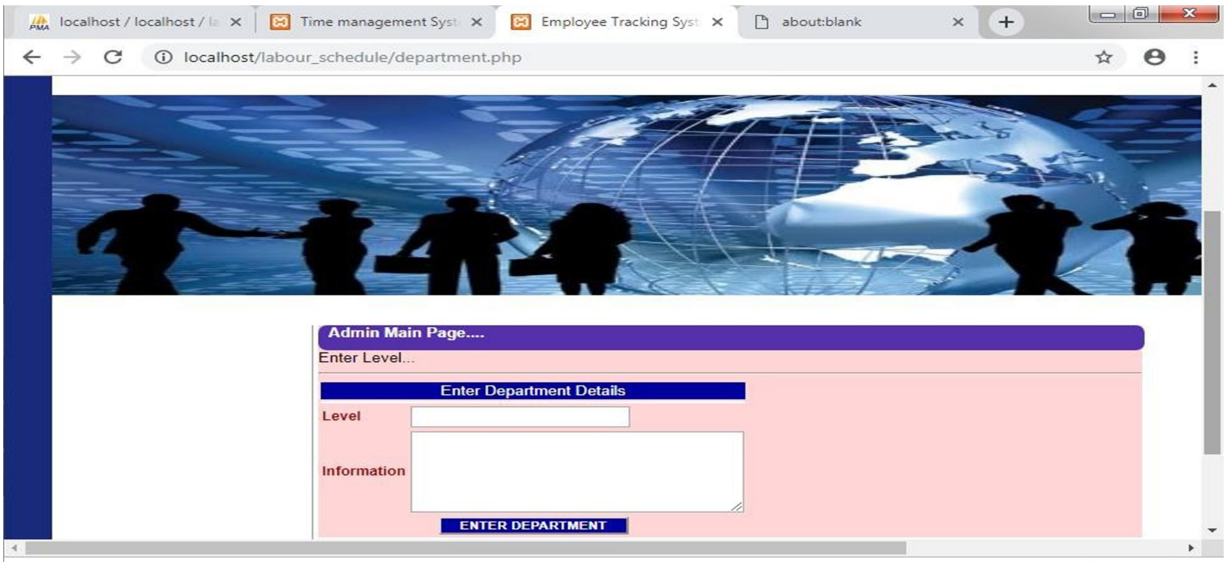

Figure 7. shows where the admin Create department, the admin can create more tasks

Figure 7. shows where the admin Create department, the admin can create more tasksFigure 8 shows task report: the admin view the various tasks that are performed by the staff. The staff gives a report of the daily task assigned to them.

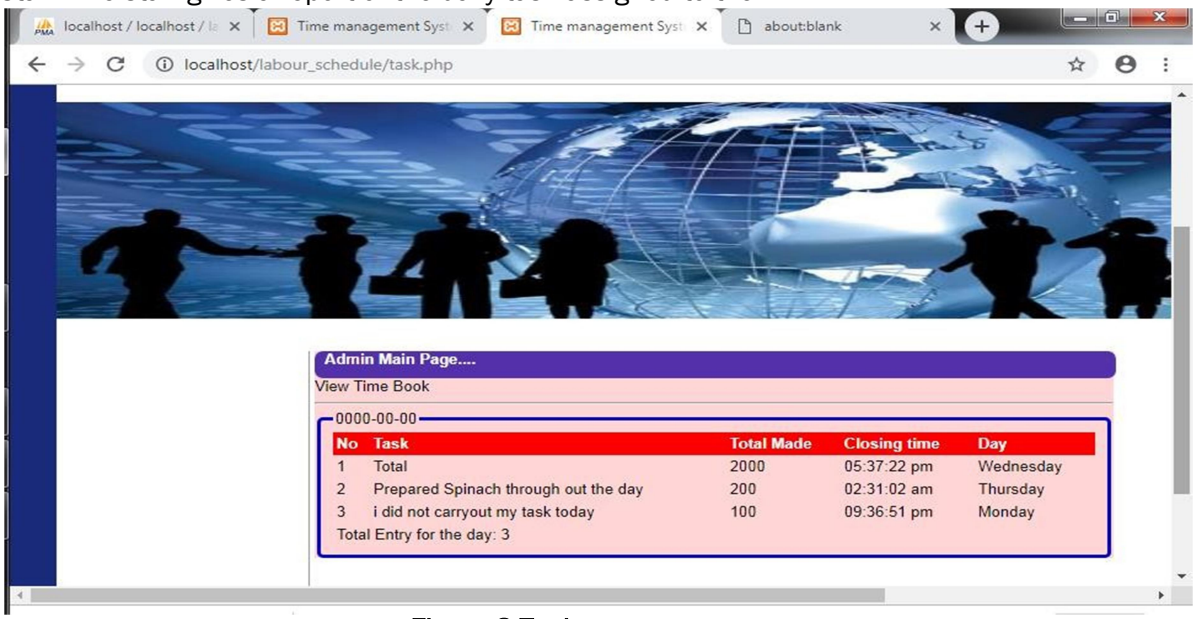

Figure 8 Task report

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Figure 9. shows the View Secretary Report page: The admin can also view secretary report.

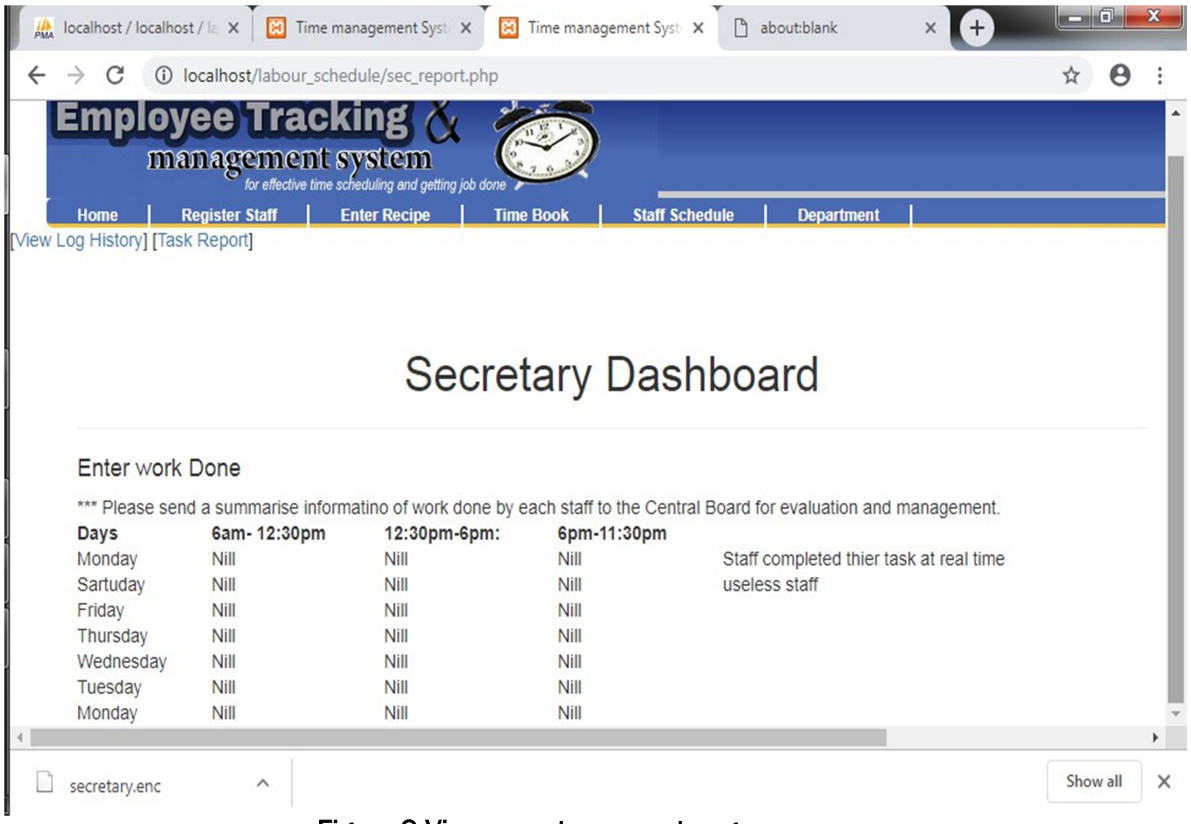

Figure 9 View secretary report page

System Testing

The system under development was tested using black box testing, this often reveals program defects that must be removed from the program. This is called debugging. Defect testing and debugging are different processes. Testing establishes the existence of defects. Debugging is concerned with locating and correcting these defects. When you are debugging, you have to generate hypotheses about the observable behavior of the program then test these hypotheses in the hope of finding the fault that caused the output anomaly. In order to ensure quality of the software it is extremely crucial to ensure that the software so delivered is defect free. This can be ascertained by testing the developed code. Various tools and techniques are available for testing at different levels such as regression testing, performance testing, stress testing etc. Based on the need, the testing methods are chosen and reports are prepared about bugs. After this process the system again goes to development phase fortesting the hypotheses may involve tracing the program code manually.

It may require new test cases to localize the problem. Interactive debugging tools, which show the intermediate values of program variables and a trace of the statements executed, may be used to support the debugging process. An employee tracking system for staff in the Department of Computer Science Department of UNIBEN was critical reviewed and was implemented. Thus, the manual documentation has made most organizations to pass through the stress of monitor their staff and also handle the affairs of the organization adequately. However, to checkmate the employee activities, it becomes necessary to create a process like an employee tracking system that will help monitor them at any given place in the organization. Hence, this study proposed a system that is geared towards providing a system to assure monitoring of employee daily activities in the organization.

5. CONCLUSION

Finally, with the employee tracking system, the university can register their staff daily activities and alsoenables the administrator to generate reports for effective labour distribution and management of time.It is possible for the Head of department to know the staff that have meet up with His/Her schedule thereby improving the teaching accuracy, reduce time consumption and workload on the side of the Head. The admin can also monitor the non-academic i.e. if staff is still in the office or did not come to work for a particular day. There are different ways of tracking or monitoring employees in an organization but the use of this software developed for computer science Department of University of Benin will erase the use of manual method of signing in/out, track staff activities particularly non-teaching staff, produce prompt response to job and quick submission of report. It is therefore recommended for high proficiency and quality assurance in the department.

REFERENCES

1. Ashwini, J., Prajakta, K., Bhakti, T. and Tanmay, K. (2015). Employee Monitoring System Using Android Smartphone.*International Engineering Research Journal (IERJ)*, 1(2):32-35.
2. Etuk, E.A. and Onwuachu, U.C. (2016).An Android based Employee Tracking System. *International Journal of Computer Applications (0975 – 8887), 153(3)*: 26-32
3. Frayer, C. (2002). Employee privacy and internet monitoring: balancing workers' rights anddignity with legitimate management interests. *Business Lawyer*, *57*(2), 857 - 878.
4. Kalyani, B., Priyanka, S. and Shamal, B. (2015), Employee Monitoring System Using Android Smart Phone.*International Journal on Recent and Innovation Trends in Computing and Communication*,3(2): 537 - 541.
5. Shermin, S., Asma, E. and Ishrat, J.M. (2015). A Smart, Location Based Time And Attendance Tracking System Using Android Application International Journal Of Computer Science, Engineering And Information Technology (Ijcseit),
6. Sonal, K., Sushma, K. and Gadade, H.D. (2016). Employee Tracking and Monitoring System Using Android *International Journal of Innovative Research in Advanced Engineering (IJIRAE*) SSN: 2349-2763: 1-4