

# Development of an E-Based Hostel Management System

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**Abstract:-** This project is based on Design and Implementation of an E-based Hostel Management System for use at Olayinka Hostel, Federal School of Surveying, Oyo. It evolved from the manual file record system used to store hostel details, room details, student records, hall allocation and other data in the hostel. With the help of the internet, computers and other mobile devices are used to manage hostel records and help the administrator effectively access these records. This research aims to create an efficient and reliable hostel allocation system that can do all the manual work with ease. This project is carried out using HTML, CSS for the front-end design while PHP was used for the back-end and MySQL for the database. The developed system overcomes the drawbacks of traditional methods of hostel management; it is more user-friendly, graphical-user-interface oriented, reliable, efficient and secured with access control mechanism. It is recommended that Olayinka hostel and other institutions or organization managing hostels should adopt the e-based system for their hostel management so as to reduce manual paper work, administrative tasks and save times spent by on doing things manually with the old hotels management technique.

**Keywords:-** Hostel, System, Hall Allocation, Hostel Management system, Hostel Administration, etc.

## I. INTRODUCTION

Hostel can be identified as a place of residence that schools, colleges or universities built to accommodate students of various categories, all hostels being managed by the respective institutions are supervised by the hostel wardens and other category of staff. The hostel generally consists hundreds of students that resides in a particular halls at particular time. All of them make a group of students (Amina Iftikhar & Asir Ajmal, 2015). Hostels in most cases provides shared sleeping quarters, common facilities like kitchens and lounges, and a range of services and amenities. Hostel management means a way of running and overseeing the day-to-day operations of a hostel. This includes equipment upgrading and the facility overhauling, financing, staffing, and guests management. Hostel management is a complex task that needs a range of skills and expertise, including communication, organization, and problem-solving (Sharma & Kumar, 2016).

The hostel management system is often a web-based software which provides students accommodation to the clientele more efficiently. This project also keeps details of the hostellers and applied students. This system is intended to minimize human works and make hostel bookings an easier job for students and hostel authorities by providing online application for hostel, automatically select the students from the waiting list and mess calculation, complaint registration, notice board etc. The goal of this research work is to provide a solution to the problem of hostel management, by designing a computerized system which is user-friendly and GUI (graphical user interface)-oriented that will be compatible with the existing manual system. The system will solve the problem of hostel management; thus, helping to reduce inherent problems associated with the manual hostel management. There are a lot of drawbacks in keeping and maintaining a hostel using the manual method such as time wastage in searching for registers, inadequate use of statistical data, error prone calculations, and redundancy of information. This paper is aimed at devising a system that will remove the above problems and improve efficiency in terms of hall administration and use by the students allotees.

This paper focuses mainly on design and implementation of an e-based hostel management system for Olayinka hostel, Federal School of Surveying, Oyo, Oyo State, Nigeria by reviewing the existing manual system, developing a secured central database system that will contain information of all the available rooms in the hostel and allocations done on them, implementing the system using web based technologies to solve the problem of up to date information and testing the developed software to check for reliability and efficiency.

The system will also be of importance to institution and general hostel or house managers as it will ease to a great extent the hostel management processes. HTML, CSS and JavaScript were used for the frontend development while PHP and MYSQL were used for the backend development to debug, test, check for reliability and efficiency of the developed software.

## II. LITERATURE REVIEW

Hostel management involves the management and operation of a facility that provides accommodation services to resident students. As proposed by Gupta and Bhatia (2015), hostel management is a mundane task that involves a range of activities such as maintenance, security, catering, and customer service. Hostel management is one of the most important aspects of a student's life. It is the responsibility of the hostel administration to provide a safe and comfortable environment for each of their students. According to the article *Hostel Management: Principles and Practice* by Sharma and Kumar (2017) hostel management involves the provision of food, accommodation, and other related services to students, travelers, and other individuals the facilities, finances, staff, and guests effectively and efficiently. Effective hostel management requires a focus on customer service, financial management, and staff training. Hostel management systems provides a range of menus that enable efficient management of hostel operations which includes booking management, room allocation, inventory management, reporting and analytics, and guest communication.

Pashaei, Shehri and Ahmadi (2015) named several important issues which are necessary to effectively manage hostels and their efficiency. For instance, the study identified the need for highly configurable Hostel Management Information System (HMIS) which can be tailored to the needs of different hostel types and facilities, as well as for multilingual user interfaces which could enable international hostels to provide high quality services to their guests. In a study by Ukpere, Adewale and Omoregbe (2017), the authors founded that Hostel Management Systems can improve communication between hostel staff and students, as well as between different departments within the hostel. The study also noted that such systems can improve security by tracking the movement of people and property within the hostel. According to Kamble and Rajput (2017), a Hostel Management System is a web-based software application that helps hostel administrators manage hostel operations, including room allocation, student records, billing, and security. The authors noted that such systems can improve efficiency and reduce errors associated with manual management. In a study by Ukpere, Adewale & Omoregbe (2017), the authors found that Hostel Management Systems can improve communication between hostel staff and students, as well as between different departments within the hostel. The study also noted that such systems can improve security by tracking the movement of people and property within the hostel.

Khare and Sisodia, (2018) published a paper titled "Hostel Management System: A Case Study" in the *International Journal of Computer Sciences and Engineering*. The authors analyze the impact of the hostel management system on various aspects of hostel operations. They evaluate its effectiveness in streamlining processes, reducing manual efforts, improving data accuracy, and enhancing overall efficiency. The study also considers the

feedback and satisfaction of hostel staff and residents regarding the implemented system. By presenting empirical findings and analysis, this study offers insights into the real-world implementation of a hostel management system and its impact on improving the operations of a hostel facility within an Indian university context.

## III. METHODOLOGY

The web-based application was implemented using HTML, CSS and JavaScript for the user interface which comprises of three main pages which are: Admin Page, Staff Page and Student Page. While the Backend was done with PHP programming language and MYSQL, PHP was used to link the frontend with the backend and MYSQL was used for the database where all the students' information who register for the Hostel will be stored for later retrieve.

### A. Description of Existing System

The existing system for hostel management typically includes the following features:

- Room allocation and management, which allows administrators to assign rooms to guests and check room availability
- Guest management, which allows the creation and management of guest profiles such as name, contact details, and duration of stay.
- Billing and payment management: the system allows the creation and management of bills and invoices for guest stays, including charges for room and board, meals, and other services. Payment processing and tracking of outstanding balances are also included.
- Reporting and analytics: here, the system generates reports on various aspects of hostel operations, such as occupancy rates, revenue, and guest satisfaction. It also provides data analytics capabilities to help administrators make informed decisions.
- Overall, the existing system for hostel management is designed to streamline administrative tasks and improve the efficiency and effectiveness of hostel operations.

### ➤ Weakness of the Existing System

There are several weaknesses and limitations that need to be addressed. Some of these weaknesses include:

- Limited functionality: The existing system may lack certain features that are important for efficient hostel management, such as online booking, automatic room allocation, or integration with other systems.
- Data security: The existing system may not have adequate security measures in place to protect sensitive guest and administrative data from unauthorized access or cyber-attacks.
- User interface: The user interface of the existing system may be outdated or difficult to use, which can lead to user error or reduce efficiency and adoption. It may also have a poor user interface or require extensive training, which can lead to user frustration and reduce adoption.

- **System compatibility:** The existing system may not be compatible with the latest hardware or software, which can limit its functionality and cause technical issues.
- **Inefficiency:** The existing system may be slow, require manual data entry, or be prone to errors, which can lead to delays and reduce efficiency.
- **Lack of integration:** The existing system may not integrate with other systems or platforms, such as online booking systems or payment gateways, which can lead to the need for duplicate data entry and reduce the overall user experience.
- **Addressing these weaknesses** can help to improve the overall effectiveness and efficiency of the hostel management system, enhance the user experience, and support better decision-making.

### B. Description of the Developed System

The developed system for hostel allocation is a software application designed to automate and streamline the various administrative tasks associated with allocating of rooms to students and managing room availability in facility. The developed system aims to address the weaknesses of the existing system by providing the following features:

- **Online booking:** The developed system allows students to make online bookings, which are automatically updated in the system, and can be managed by the administrators.
- **Automatic room allocation:** The developed system allows for automatic room allocation based on guest

preferences and availability, reducing the need for manual allocation.

- **Billing and payment management:** The developed system automates the billing and payment process, including tracking of outstanding balances and integration with online payment gateways.
- **Staff management:** The developed system includes a staff management module that allows administrators to manage and track staff schedules, assign tasks and responsibilities, and track performance.
- **Data security:** The developed system includes adequate data security measures to protect sensitive guest and administrative data from unauthorized access or cyber-attacks.

Overall, the proposed system for hostel management aims to provide a more efficient, user-friendly, and secure solution for managing hostel operations, reducing administrative burden, and improving the student's experience.

### ➤ Flowchart of the Developed system

The flowchart in fig 4 shows the flow of control in program modules. Fig 6 shows the administrator use case system, explaining how the admin staff would sign up, login to the system, interact with the dashboard and view what the system has to offer while fig 7 is the student's use case, which explains students would login into the system using their matric number, interact with the dashboard, check room availability, report complaints, change password and update their profile.

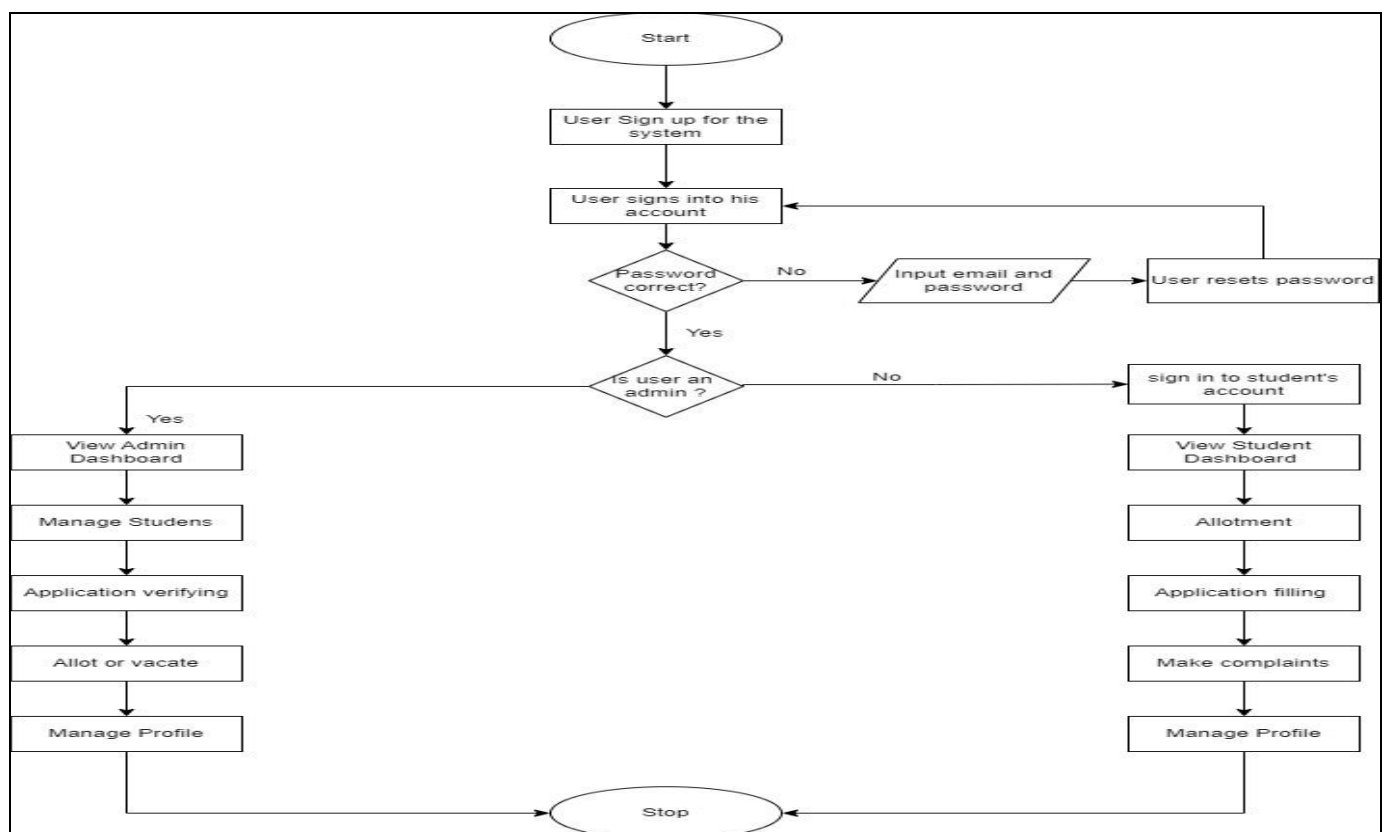


Fig 1: Flowchart of an E-Based Hostel Allocation System

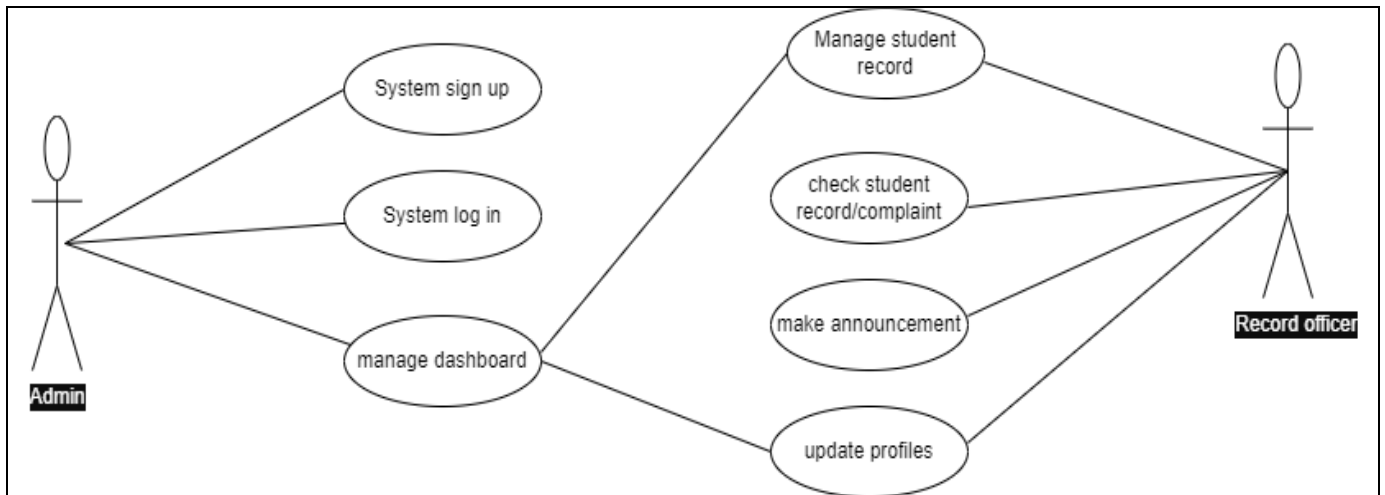


Fig 2: Admin Use Case Diagram

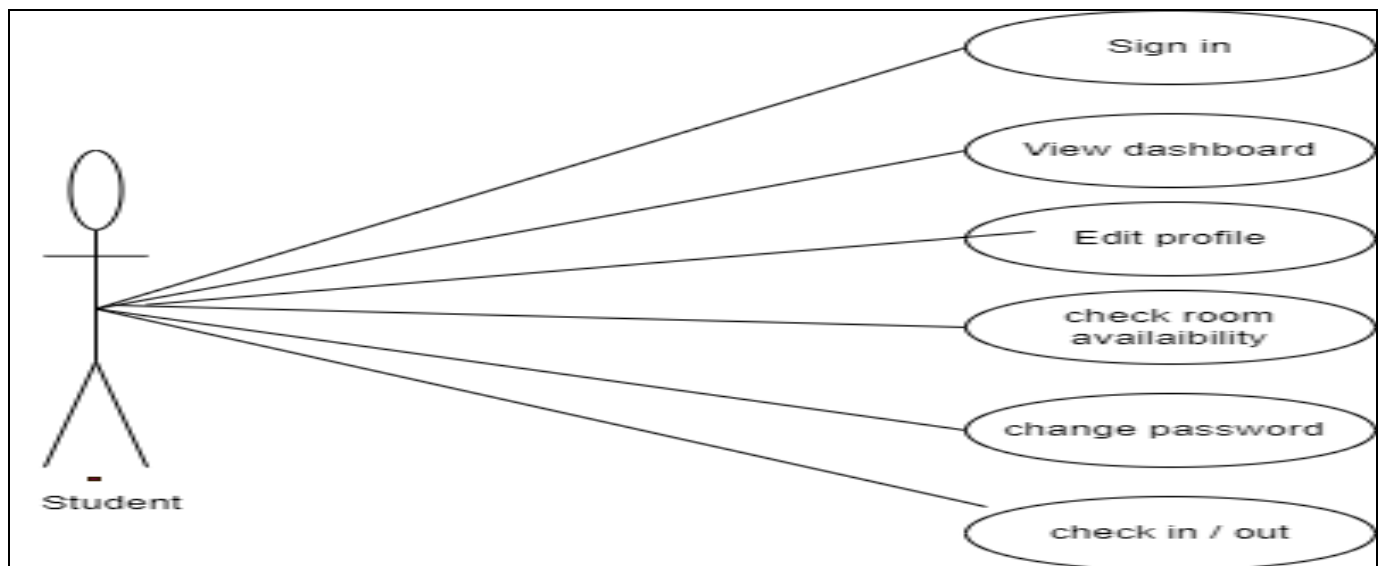


Fig 3: Student Use Case Diagram

#### ➤ Database Design (Table Structures)

MYSQL database has been chosen for developing the relevant databases. The database contains five tables, which are:

- Admin structure table: having these as the table fields (Id, e-mail, password, registration date and updating date).
- User login structure table: having these as the table fields (Id, Admin Id, Ip and log-in time).
- User registration structure table: having these as the table fields (Id, Registration No, first name, middle name, last name, gender, contact number, email, password, registration date, updating date and password update date).
- Room structure table: having these as the table fields (Id, Seater, room number, fees and posting date) and
- Registration structure table: having these as the table fields (Id, room number, Seater, Fees payment, Food status, Stay from, Duration, Course, Reg no, First Name, Middle Name, Last Name, gender, Contact no, Email, Guardian Name, Guardian Relationship, Guardian

Contact no, Address, City, State, Pincode, permanent Address, permanent City, permanent State, permanent Pincode, posting Date and updating date.

#### C. Requirement of the Developed System

Online booking, automatic room allocation, smooth billing and payment management reporting and analytics, data security, scalability, user interface and integration are the requirements and needs being met in the new system.

#### D. System Coding Testing

The hostel management system went through some steps so as to ensure that the hostel management system's code functions correctly, meets the requirements of the system, and is user-friendly. It also ensures that the code is well-organized, easy to maintain, and scalable for future upgrades or changes. The steps are unit testing, integration testing, regression testing, load testing, code review and documentation.

#### IV. RESULTS AND DISCUSSION

##### A. Program Manual

The instructions and information on how to operate the software program or system efficiently are provided in what is often known as a user manual or user guide. This documentation describes each module and demonstrates the software's graphical user interface.

##### ➤ Home Page

This is the welcome page of the project, it is opened when the URL of the hostel management system, when you open this page, it would bring the User registration, User login and the Admin login interfaces.

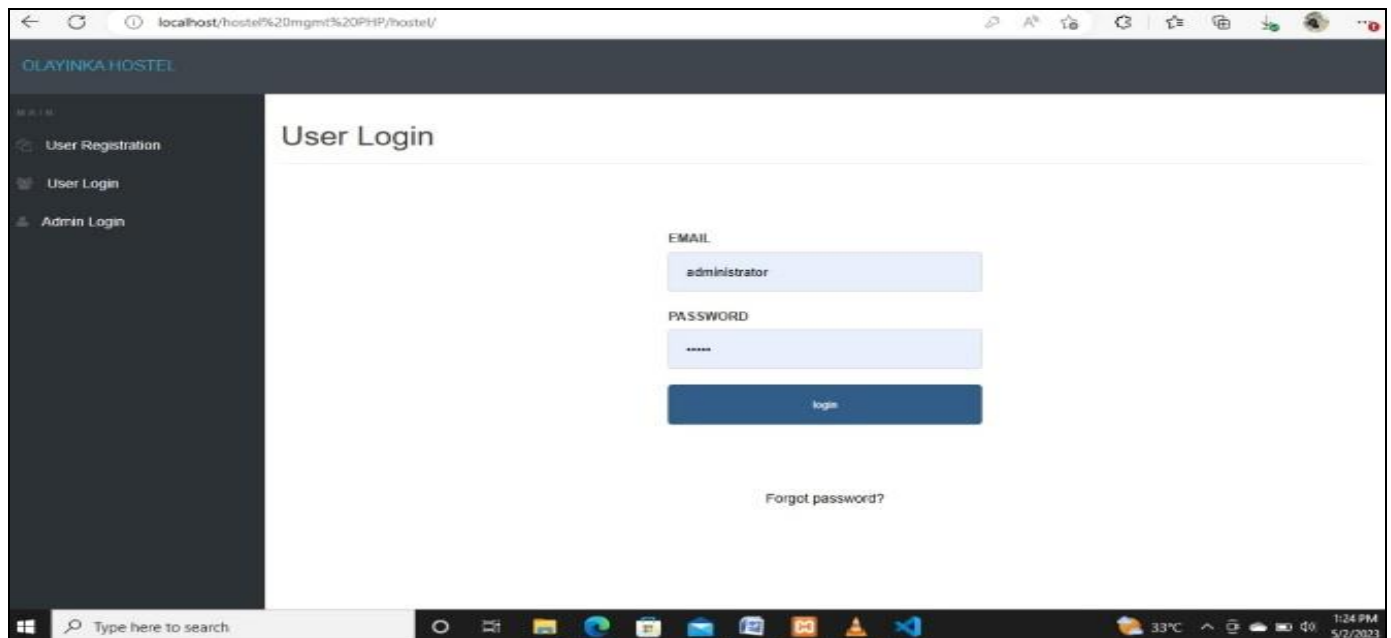


Fig 4: Showing the Home Page

##### ➤ User Registration

Before a user can login into the application interface, he/she has to create an account, that is, he/she has to

register, this page includes the registration number (matric number), first name, middle name, last name, gender, contact info, email id.

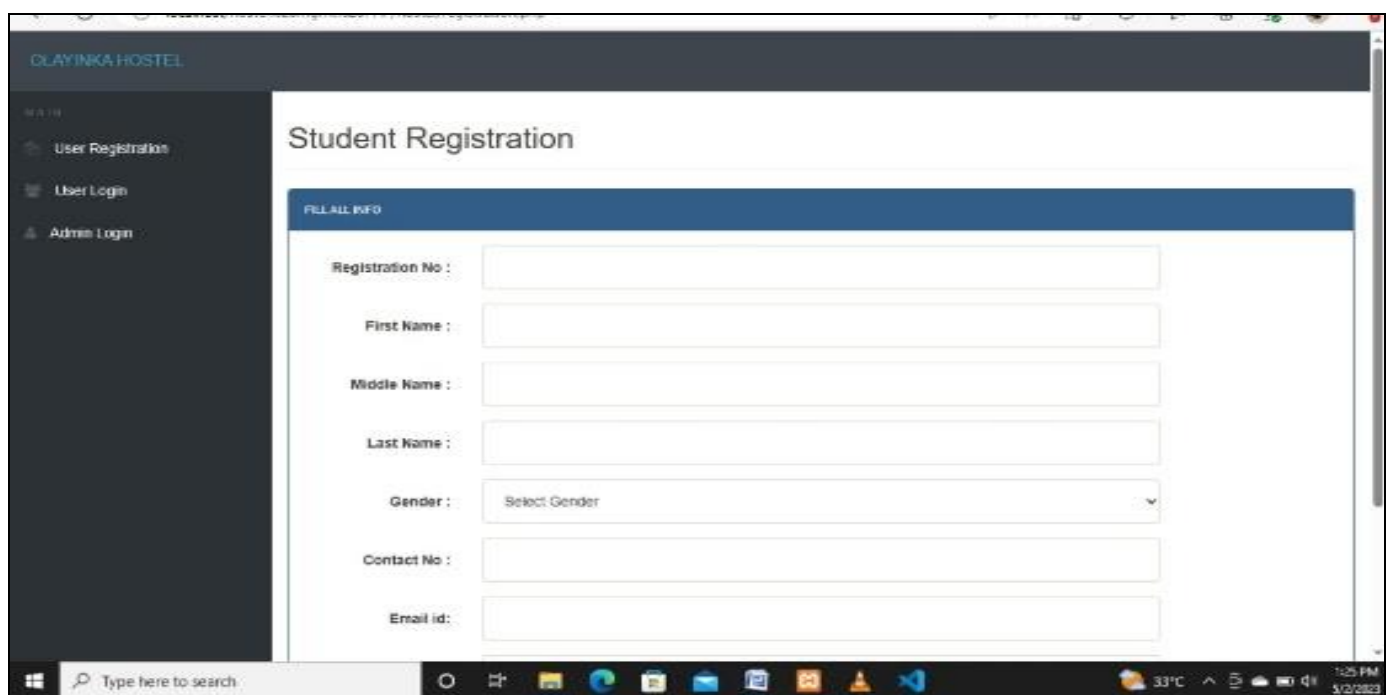


Fig 5: Showing the User Registration



➤ *User Login*

This interface is accessed by clicking on the login, which is on the homepage, and it brings you to the place

where you see your profile and also request for room, it comprises of the profile, rooms, manage students, and access log.

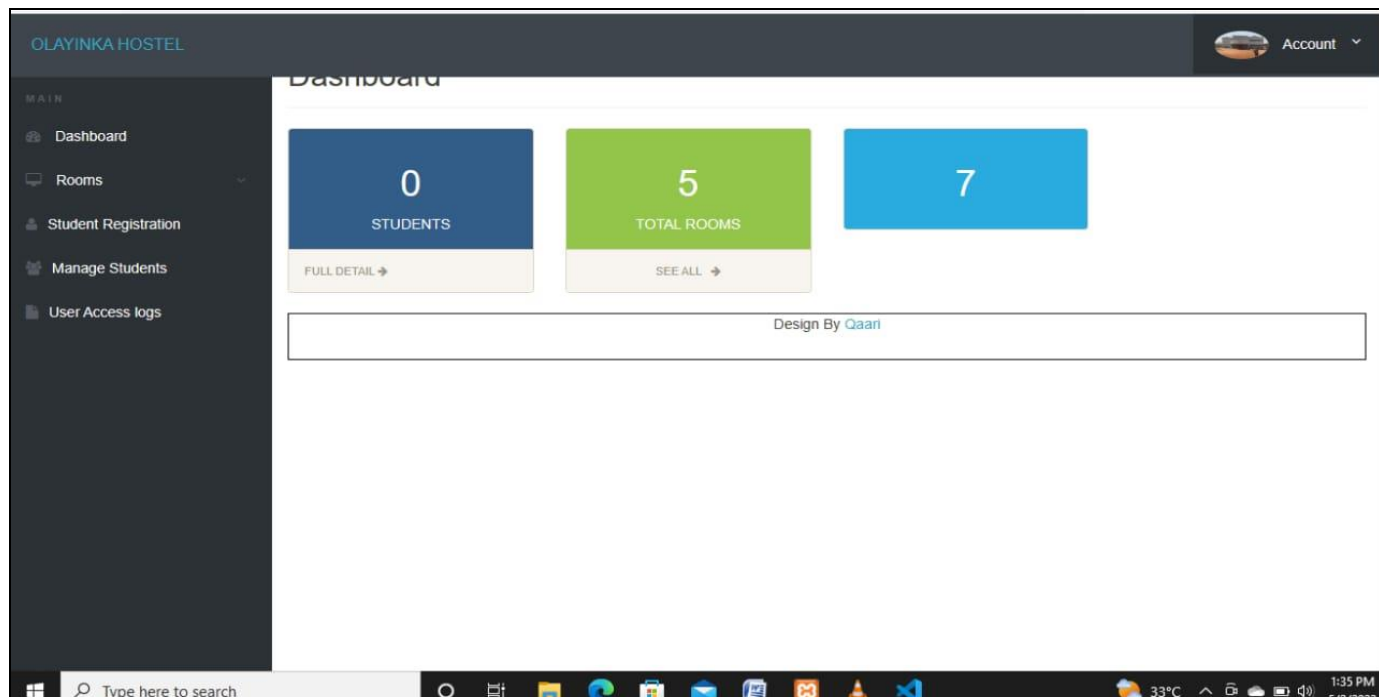


Fig 6: Showing the user Login Dashboard

➤ *Admin Login*

This is the interface where the admin logs in to check the students that are about to book rooms and the rooms that are being booked.

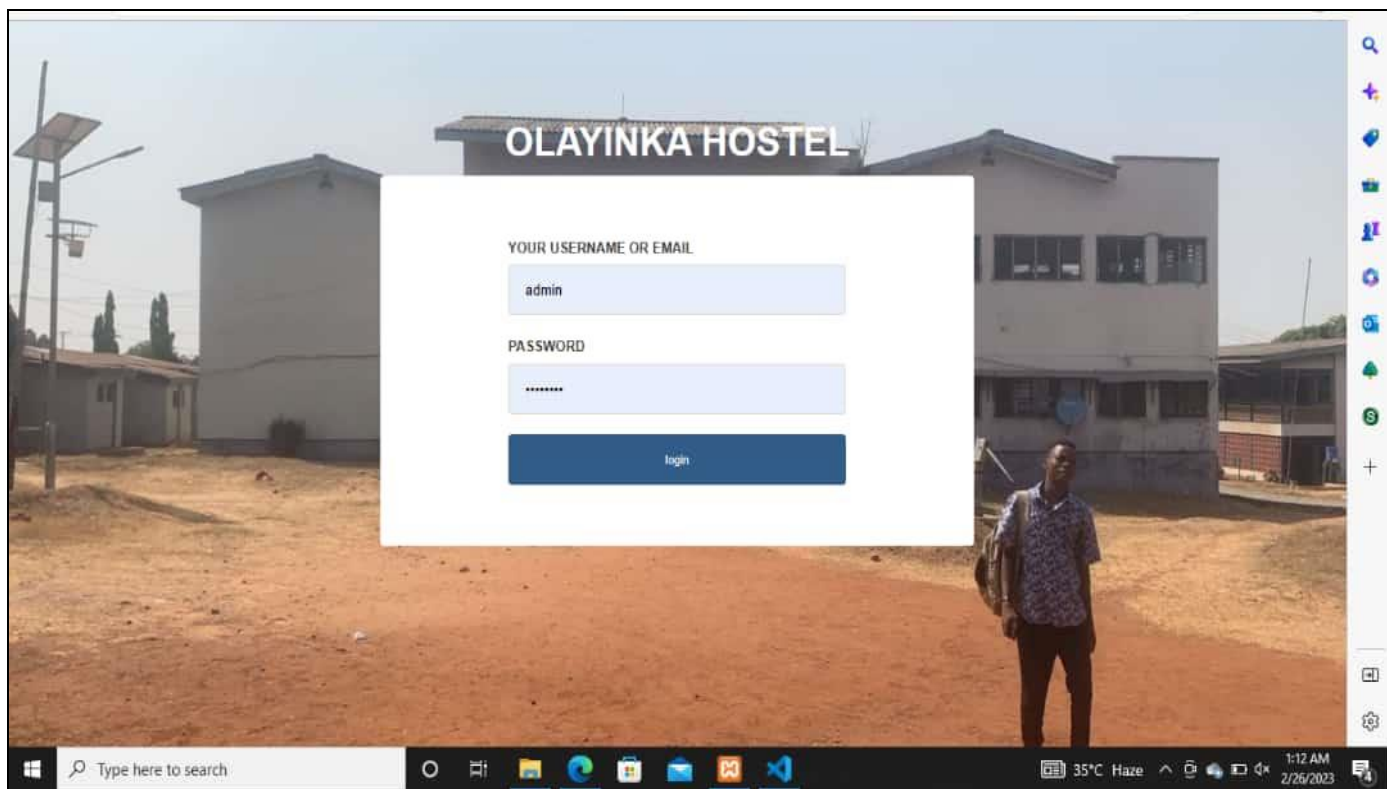


Fig 7: Showing the Admin Login

### ➤ Admin Profile

This module is the page that appears after which the admin logs in to the interface, it comprises of the username,

which cannot be changed, the email of the admin, the registration date, and It also has the change password interface in it.

The screenshot displays the 'Admin Profile' page of the 'OLAYINKA HOSTEL' system. The left sidebar contains navigation links: Dashboard, Rooms, Student Registration, Manage Students, and User Access logs. The main content area is divided into two sections: 'ADMIN PROFILE DETAILS' and 'CHANGE PASSWORD'. The 'ADMIN PROFILE DETAILS' section shows the following information: Username: admin (with a note 'Username can't be changed'), Email: code.ipuri@gmail.com, and Reg Date: 2016-04-04 13:31:45. There are 'Cancel' and 'Update Profile' buttons at the bottom of this section. The 'CHANGE PASSWORD' section has three input fields for 'old Password', 'New Password', and 'Confirm Password', along with 'Cancel' and 'Change Password' buttons. The Windows taskbar at the bottom shows the time as 1:28 PM on 5/2/2023.

Fig 8: Showing the Admin Profile

### ➤ Add Room

This interface is in the admin region, where the admin adds room, or create rooms that should be included in the rooms that should be booked, while applying for allocation.

The screenshot displays the 'Add a Room' page of the 'OLAYINKA HOSTEL' system. The left sidebar contains navigation links: Dashboard, Rooms, Student Registration, Manage Students, and User Access logs. The main content area is titled 'Add a Room' and contains a form with the following fields: 'Select Seater' (a dropdown menu), 'Room No.' (a text input field), and 'Fee(Per Student)' (a text input field). There is a 'Create Room' button at the bottom of the form. The Windows taskbar at the bottom shows the time as 1:29 PM on 5/2/2023.

Fig 9: Showing the Add Room

➤ *Manage Rooms*

This interface shows all the rooms that have been included and created, the ones that have been allocated to

students and the ones that are yet to be allocated to students, and also viewing of the application status of the students

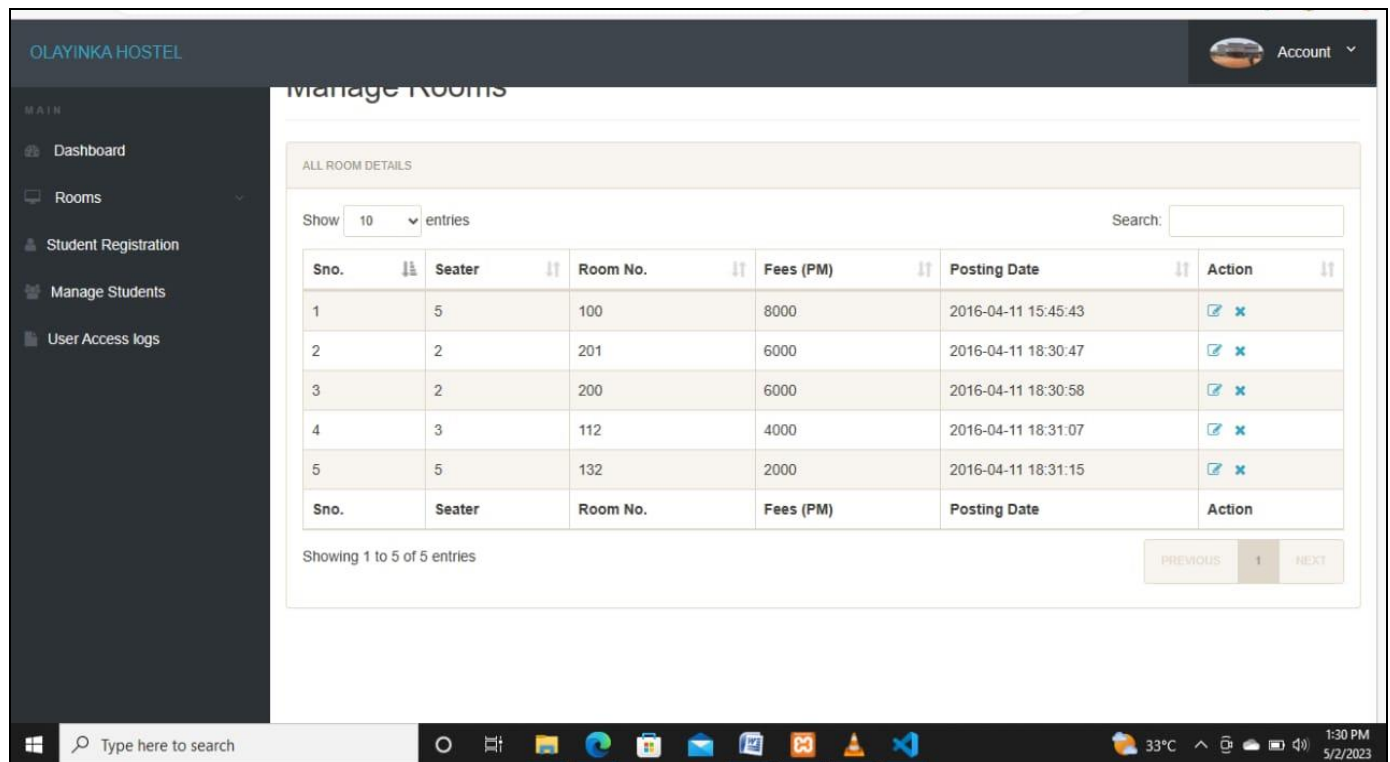


Fig 10: Showing Manage Rooms

➤ *Hostel Registration Interface*

This is the part of the app, where you request and book for room, it is part of the login interface section.

**Registration**

**FILL ALL INFO**

**Room Related info**

Room no.

Seater

Fees Per Month

Stay From

Duration

**Personal info**

Fig 11: Showing the Hostel Registration Interface



## ➤ Access Log

This interface shows access logs, that is the times a user logs in and log out of the system.

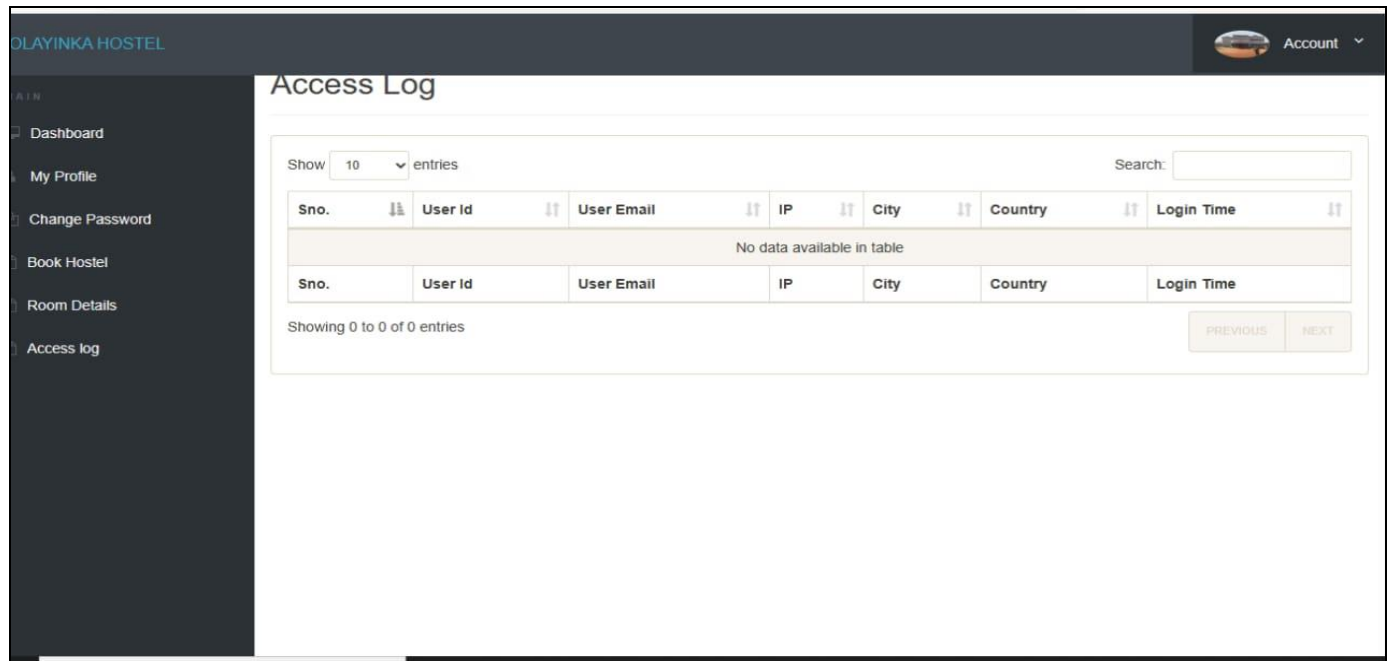


Fig 12: Showing the Access Log Interface

### B. User Requirement

The section of hardware configuration is an important task related to the software development insufficient random access memory may affect adversely on the speed and efficiency of the entire system. The process should be powerful to handle the entire operations. The hard disk should have sufficient capacity to store the file and application.

- Processor: Pentium IV and above
- Processor speed: 1.4 GHz Onwards
- System memory: 128 Mb minimum 256 Mb recommended
- Cache size: 512 KB
- RAM: 512 MB(Minimum)
- Hard disk: 80Gb x. Monitor: SVGA Color 15"

## V. CONCLUSIONS

This Hostel Management System is a user-friendly computer-based system for managing hostel facilities in institutions. It has been designed to automate, manage and look after the overall processing of records of students residing in a large hostel. It is capable of managing Enquiry details, Student details, etc. The developed system provides solution to manual hostel management problems and also provides information such as hostel information, hostel room information, and hostel accounts information. The software offers stability, cost-effectiveness and usability. It provides the most flexible and adaptable standards management system solutions for hostel. In short the project was created utilizing HTML, PHP, JavaScript and MySQL with adaptability for future improvement. The functionality of the present programming requires a proper approach

towards programming advancement. This Hostel administration website is intended for individuals who need to handle different activities in the hostel. It is highly recommended that Olayinka hostel and other institutions or organization with hostels hostel responsibilities should adopt the e-based system for their hostel running so as to reduce manual, paper work, administrative tasks and time - wasting repetitive tasks.

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