HOSTEL MANAGEMENT SYSTEM

A MINI PROJECT REPORT

Submitted by

HARSAVARDHINI R (221801016)
KAVIYA S (221801024)

in partial fulfillment for the award of the degree of

BACHELOR OF TECHNOLOGY IN ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

RAJALAKSHMI ENGINEERING COLLEGE
DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

ANNA UNIVERSITY, CHENNAI

NOV 2024

ANNA UNIVERSITY: CHENNAI

BONAFIDE CERTIFICATE

Certified that this Report titled "**HOSTEL MANAGEMENT SYSTEM**" is the bonafide work of **HARSAVARDHINI R (221801016), KAVIYA S (221801024)** who carried out the work under my supervision. Certified further that to the best of my knowledge the work reported herein does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

SIGNATURE   **SIGNATURE**

Dr. J.M. Gnanasekar   Ms. S.Renukadevi

Professor and Head   Assistant Professor

Department of Artificial Intelligence   Department of Artificial Intelligence

and Data Science   and Data Science

Rajalakshmi Engineering College   Rajalakshmi Engineering College

Chennai – 602 105   Chennai – 602 105

Submitted for the project viva-voce examination held on _____

INTERNAL EXAMINER   **EXTERNAL EXAMINER**

ACKNOWLEDGEMENT

Initially we thank the Almighty for being with us through every walk of our life and showering his blessings through the endeavor to put forth this report. Our sincere thanks to our Chairman Mr. S. MEGANATHAN, B.E, F.I.E., our Vice Chairman Mr. ABHAY SHANKAR MEGANATHAN, B.E., M.S., and our respected Chairperson Dr. (Mrs.) THANGAM MEGANATHAN, Ph.D., for providing us with the requisite infrastructure and sincere endeavoring in educating us in their premier institution.

Our sincere thanks to Dr. S.N. MURUGESAN, M.E., Ph.D., our beloved Principal for his kind support and facilities provided to complete our work in time. We express our sincere thanks to Dr. J.M. GNANASEKAR., M.E., Ph.D., Head of the Department, Professor and Head of the Department of Artificial Intelligence and Data Science for her guidance and encouragement throughout the project work. We are glad to express our sincere thanks and regards to our supervisor and coordinator, Ms. S. RENUKADEVI, Assistant Professor, Department of Artificial Intelligence and Data Science, Rajalakshmi Engineering College for his valuable guidance throughout the course of the project.

Finally, we express our thanks for all teaching, non-teaching, faculty and our parents for helping us with the necessary guidance during the time of our project.

ABSTRACT

The increasing complexity of hostel administration in educational institutions demands a streamlined and digital approach for efficient management. Traditional systems involving manual entries for room allocation, leave management, complaint handling, and student records have led to inefficiencies, miscommunication, and redundancy. To address these limitations, this project introduces a robust and fully automated Hostel Management System developed using PHP, MySQL, and Bootstrap. This web-based platform offers role-specific access for students and administrators, allowing them to perform various hostel-related operations in real time. With features such as room booking, leave application, room change requests, complaint registration, and dynamic capacity tracking, the system ensures transparency, quick processing, and enhanced record-keeping. The project is designed to function effectively in any institutional setup, supporting scalability, user-friendliness, and operational excellence.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER I

INTRODUCTION

1.1 GENERAL

In the current academic and institutional ecosystem, the efficient management of hostel facilities has become a crucial requirement. With a significant increase in student populations and the expanding complexity of educational infrastructure, the need for a structured, digital hostel management system has never been greater. Hostel administration includes several tasks such as room allocation, tracking of student movement, processing leave applications, managing complaints, monitoring room capacity, and responding to change requests.

Traditionally, these tasks have been handled through manual paperwork and verbal communication, leading to issues such as data loss, inefficiency, miscommunication, and delays. This results in dissatisfaction among students and unnecessary burdens on hostel staff. A systematic approach involving the use of web technologies like PHP and MySQL can help automate these processes effectively. The Hostel Management System developed in this project is aimed at addressing all the above issues by implementing a centralized platform accessible to both students and hostel administrators.

1.2 NEED FOR THE STUDY

The need for a hostel management system is rooted in the limitations of the manual processes currently employed by many institutions. These manual methods are time-consuming, prone to errors, and highly dependent on physical presence and documentation. As hostels cater to large numbers of students, tracking each student's room allotment, leave records, complaint submissions, and room change history becomes increasingly difficult without a digital system. Furthermore, the absence of real-time tracking and a centralized database makes it hard to retrieve accurate information quickly. A digital hostel management system allows for better coordination between students and staff, reduces the time taken for processing requests, improves data accuracy, and provides a user-friendly experience. This

system also promotes transparency, as students can view the status of their applications and bookings, while admins can track room occupancy and student requests in real time. Ultimately, the need for the study lies in replacing outdated systems with efficient, digital alternatives.

1.3 OVERVIEW OF THE PROJECT

This project presents a web-based Hostel Management System that is accessible through any browser. The system is divided into two main modules: one for students and one for administrators. Students are provided with credentials to log into their accounts and perform actions such as applying for room booking, requesting leaves, filing complaints, and submitting room change applications. The administrator module allows the hostel warden or designated staff to log in and view a dashboard summarizing all pending and approved requests. Admins can approve or reject applications, update room capacity, and view complaint statuses. The entire system is built using PHP as the server-side scripting language, MySQL as the relational database management system, and Bootstrap for the responsive frontend design. The system architecture supports real-time updates and ensures that all data is stored securely and retrieved efficiently when needed.

1.4 OBJECTIVES OF THE STUDY

The main objective of the Hostel Management System project is to create a streamlined platform that simplifies and automates all hostel-related tasks. This includes not just room booking and student management, but also functionalities like complaint tracking and request approval. The goal is to enhance the operational efficiency of hostel management by reducing dependency on paper records, minimizing manual errors, and enabling quick access to information. The system is also designed to improve student satisfaction by giving them a convenient way to communicate with hostel authorities. Through this project, we aim to develop a system that is scalable, secure, user-friendly, and adaptable to various institutional requirements. It will also act as a foundation for future enhancements like fee management, biometric integration, and mobile app versions.

CHAPTER II

REVIEW OF LITERATURE

2.1 INTRODUCTION

In recent years, several institutions and software developers have attempted to automate hostel management through software tools and web portals. A review of existing literature and software systems reveals that while there are systems that handle specific tasks like room allocation or student registration, very few offer an integrated solution. Most existing systems are either too simplistic, lacking features like complaint handling and room change requests, or too complex, making them difficult to use for non-technical staff. In analyzing various projects and commercial solutions, it was observed that many lacked a user-centric approach and failed to cater to both the administrative and student perspectives. For example, some systems did not allow students to view their booking history or request status, while others did not provide real-time updates on room occupancy. These gaps in existing systems highlight the importance of building a comprehensive and intuitive hostel management platform that can be used by all stakeholders efficiently.

2.2 FRAMEWORK OF LCA

To develop a reliable and efficient hostel management solution, it was important to conduct a comparative analysis of existing systems. Through the LCA approach, various features of existing tools were evaluated, including user interface design, backend functionality, database structure, and system scalability. The findings indicated that many tools used outdated technologies, had poor security implementations, or were not mobile responsive. Additionally, very few systems allowed for role-based access, which is essential in maintaining data integrity and user accountability. The lack of a complaint management feature in most tools further emphasized the need for a more robust solution. Based on this analysis, the proposed Hostel Management System was designed to address all these shortcomings while ensuring that the system remained lightweight, fast, and user-friendly. The LCA framework played a critical role in determining the technical and functional specifications of the project.

CHAPTER III

SYSTEM OVERVIEW

3.1 EXISTING SYSTEM

The existing manual systems used in most hostels involve large amounts of paperwork and redundant tasks. Students are required to fill out physical forms to apply for leave, request room changes, or register complaints. These forms are then reviewed manually by the hostel staff, which often results in delays. In many cases, the physical records are lost or improperly filed, leading to confusion and dissatisfaction among students. Moreover, there is no proper tracking mechanism for room occupancy, which may lead to overbooking or underutilization of available rooms. The lack of a centralized database means that any kind of data analysis or reporting is extremely difficult. The current system also fails to provide students with any transparency regarding the status of their requests, as they have to repeatedly follow up with hostel authorities. Overall, the existing system is outdated, error-prone, inefficient, and not scalable.

3.2 PROPOSED SYSTEM

The proposed Hostel Management System addresses all the drawbacks of the existing system by introducing a digital interface where both students and administrators can perform tasks online. Students can log in to their accounts and submit various requests, which are then stored in the database and presented to the administrator. The admin reviews each request and takes action, with the result being reflected on the student's dashboard. This reduces the turnaround time and improves satisfaction. The system also includes modules for tracking room capacity, updating occupancy in real time, and maintaining a historical record of all transactions. Each room's status is updated dynamically, and students are shown only the available options when booking. The proposed system is built using open-source technologies, making it cost-effective and easy to deploy. It can be customized further to include additional features such as payment gateways, attendance tracking, and feedback systems.

3.3 FEASIBILITY STUDY

Before the development of the Hostel Management System, a feasibility study was conducted to ensure that the project could be implemented effectively within the given constraints. The study was divided into three parts: technical, operational, and economic feasibility. Technically, the project is feasible as it uses PHP, MySQL, and Bootstrap, which are reliable, well-documented, and supported across multiple platforms. Operationally, the system is easy to use and requires minimal training for both students and administrators. The interface is intuitive, and the backend logic is structured to handle multiple simultaneous operations without errors. Economically, the system is affordable since it uses open-source tools and can be hosted on local servers or affordable hosting platforms. There are no recurring costs apart from regular maintenance and occasional updates. The feasibility study confirmed that the project is not only viable but also capable of providing a significant return on investment in terms of time saved and administrative efficiency gained.

CHAPTER IV

SYSTEM REQUIREMENTS

4.1 HARDWARE REQUIREMENTS

The Hostel Management System is built to operate on standard desktop and laptop computers without the need for advanced or high-end components. This ensures the system remains cost-effective and accessible. The minimum and recommended hardware specifications are as follows:

- Processor: Intel Core i3 2.0 GHz or equivalent (Minimum), Intel Core i5 or higher (Recommended)
- RAM: 4 GB (Minimum), 8 GB or higher (Recommended for admin use)
- Hard Disk: At least 100 MB of free space for application files and database (Minimum), 500 MB for data expansion (Recommended)
- Display: 14-inch monitor or larger with a resolution of 1024x768 or higher
- Input Devices: Standard keyboard and mouse for navigation
- Network: Stable internet or intranet connection for multi-user access across the institution

These specifications ensure that the system can operate efficiently for both student and admin modules, supporting real-time interactions and data retrieval.

4.2 SOFTWARE REQUIREMENTS

The system uses lightweight, open-source, and easy-to-install software tools that support a wide range of platforms. The use of widely adopted technologies ensures minimal learning curve, ease of troubleshooting, and platform independence. The software stack includes:

- Operating System: Windows 10 / Linux (Ubuntu or Debian-based distributions)
- Web Server: Apache HTTP Server (via XAMPP or WAMP for local deployment)

- Backend Technology: PHP 8.0 or higher for server-side scripting

- Database Management System: MySQL 5.7 or later for structured data storage

- Frontend Technologies: HTML5, CSS3, JavaScript, and Bootstrap 5 for responsive design and layout

- Browser: Google Chrome, Mozilla Firefox, or any modern web browser with JavaScript enabled

- Additional Tools (Optional): Visual Studio Code or Sublime Text for editing code, phpMyAdmin for database administration

This combination of hardware and software ensures that the Hostel Management System is efficient, accessible, and compatible with most standard institutional IT infrastructures.

CHAPTER V

SYSTEM DESIGN

5.1 SYSTEM ARCHITECTURE

The system follows a client-server architecture where users (students and admins) interact with the frontend interface (client) through a web browser. The frontend sends requests to the backend server written in PHP. The server processes these requests, interacts with the MySQL database, and returns the required response to the client. The database is structured to store and manage student details, room records, booking status, leave applications, room change requests, and complaints. Bootstrap is used to ensure that the user interface is responsive and user-friendly across devices.

The architecture supports multiple users simultaneously while maintaining data integrity and security. All user sessions are managed securely to prevent unauthorized access. Admin and student functionalities are isolated, ensuring role-based access control. This architecture makes the system scalable, allowing future integration with features like biometric access or hostel fee management.
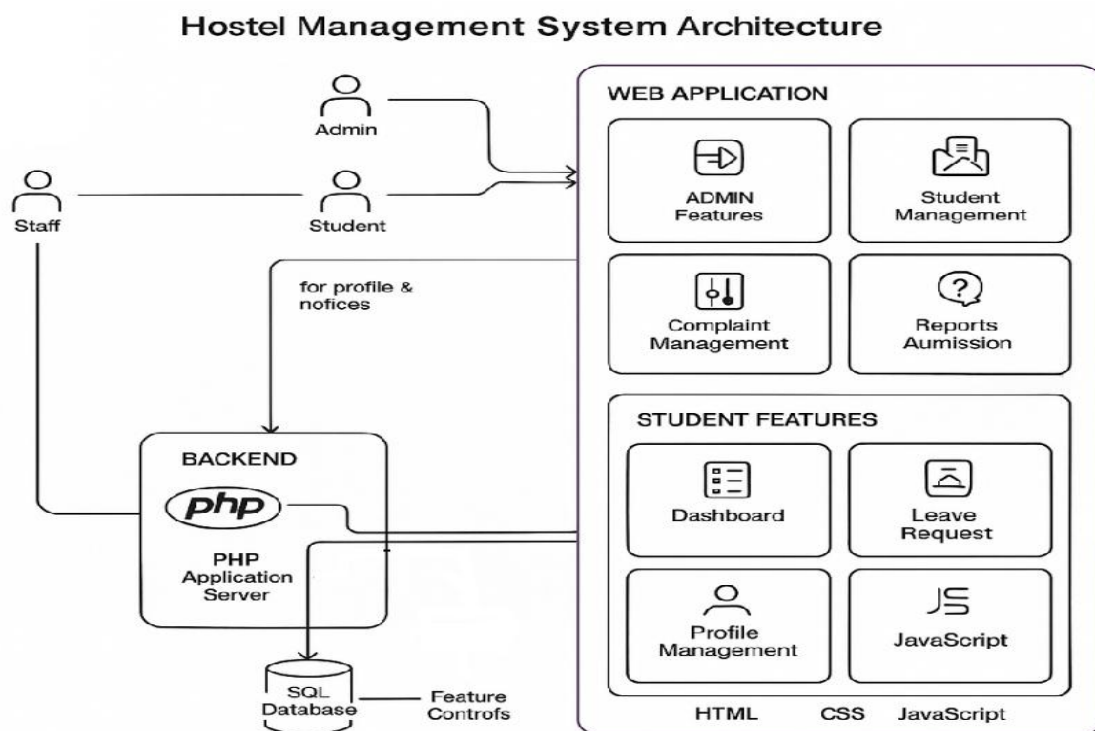

Figure 1: System Architecture

5.2 MODULE DESCRIPTION

The system is divided into several functional modules, each responsible for a specific task within the hostel management workflow. These modules are:

Login Module: Both students and admins have separate login interfaces secured with unique credentials. This module verifies user credentials and maintains user sessions.

Student Dashboard: Upon login, students are directed to a dashboard where they can view room availability, apply for leave, request room changes, and file complaints. They can also view the status of their past and current requests.

Room Booking Module: Students can browse available rooms based on real-time capacity data and submit booking requests. The system checks availability before confirming a booking.

Leave Management Module: This module allows students to submit leave applications by specifying the duration and reason. Admins can view and approve/reject these requests.

Room Change Module: Students can request to change rooms. The admin reviews the current and desired room status before taking action.

Complaint Module: Students can register complaints related to hostel facilities. Admins can view, track, and update the status of these complaints.

Admin Panel: Admins can view all student data, manage rooms, approve or reject requests, and monitor hostel occupancy. The admin panel includes tables and filters for easy navigation and decision-making.

Each module interacts with the backend database to store and retrieve relevant information, providing a smooth and responsive experience for both students and administrators.

CHAPTER VI

RESULT AND DISCUSSION

The Hostel Management System was tested extensively under different scenarios to evaluate its functionality, performance, and user interaction. Test cases included room booking with available capacity, rejection of overbooking, leave application approval workflows, complaint resolution, and dashboard updates. The results indicated that the system functions as expected in real-time.

The user interface was found to be intuitive, and both students and administrators could perform their respective actions without technical difficulties. Admin actions such as updating room data or changing request status were reflected instantly on the student dashboard, ensuring transparency. The use of Bootstrap ensured compatibility across various devices and screen sizes. The backend logic handled multiple simultaneous operations efficiently, without data loss or redundancy.

Through this project, a wide range of hostel operations were streamlined into a single platform, thereby improving communication, reducing manual effort, and enhancing the decision-making process for hostel authorities. The system not only met the initial objectives but also opened opportunities for future upgrades and enhancements.

CHAPTER VII

CONCLUSION AND FUTURE ENHANCEMENT

7.1 CONCLUSION

The development of the Hostel Management System has successfully addressed the major challenges associated with manual hostel administration. By digitizing key operations such as room allocation, leave approvals, and complaint tracking, the system has made hostel management more efficient, reliable, and user-friendly. The structured database ensures that student records are always up to date, and the role-based access control maintains data security.

The system proved to be a practical solution for educational institutions looking to modernize their hostel processes. With its modular design and scalable architecture, the project stands as a foundation for future development and can be customized further to meet institution-specific requirements. Overall, the project achieved its goal of creating a centralized, real-time, and interactive hostel management platform.

7.2 FUTURE ENHANCEMENT

Although the system meets the current requirements effectively, several features can be added in the future to enhance its functionality and scope. Some of these enhancements include:

Email/SMS Notifications: Sending alerts to students when their leave, room change, or complaint status is updated.

Hostel Fee Management Module: Allowing students to view and pay hostel fees online, with receipts generated instantly.

Attendance Tracking: Integration with biometric or RFID devices to automate student attendance in hostels.

Data Analytics and Reporting: Graphical dashboards for admins to monitor occupancy trends, issue patterns, and performance metrics.

Mobile Application Support: Developing a mobile version of the system

for easier access on smartphones and tablets.

Multi-Hostel Support: Managing multiple hostels under a single system, each with its own admin login and dashboard.

These features will further improve the utility and effectiveness of the system and keep it aligned with technological advancements.

APPENDIX

A1.1 SAMPLE CODE

php

// Sample PHP code for inserting a leave request

```php
if (isset($_POST['submit_leave'])) {
    $sid = $_SESSION['student'];
    $from = $_POST['from_date'];
    $to = $_POST['to_date'];
    $reason = $_POST['reason'];


    $stmt = $conn->prepare("INSERT INTO leave_requests (student_id, reason, from_date, to_date) VALUES (?, ?, ?, ?)");
    $stmt->bind_param("isss", $sid, $reason, $from, $to);
    $stmt->execute();
}
```

A1.2 SCREENSHOTS
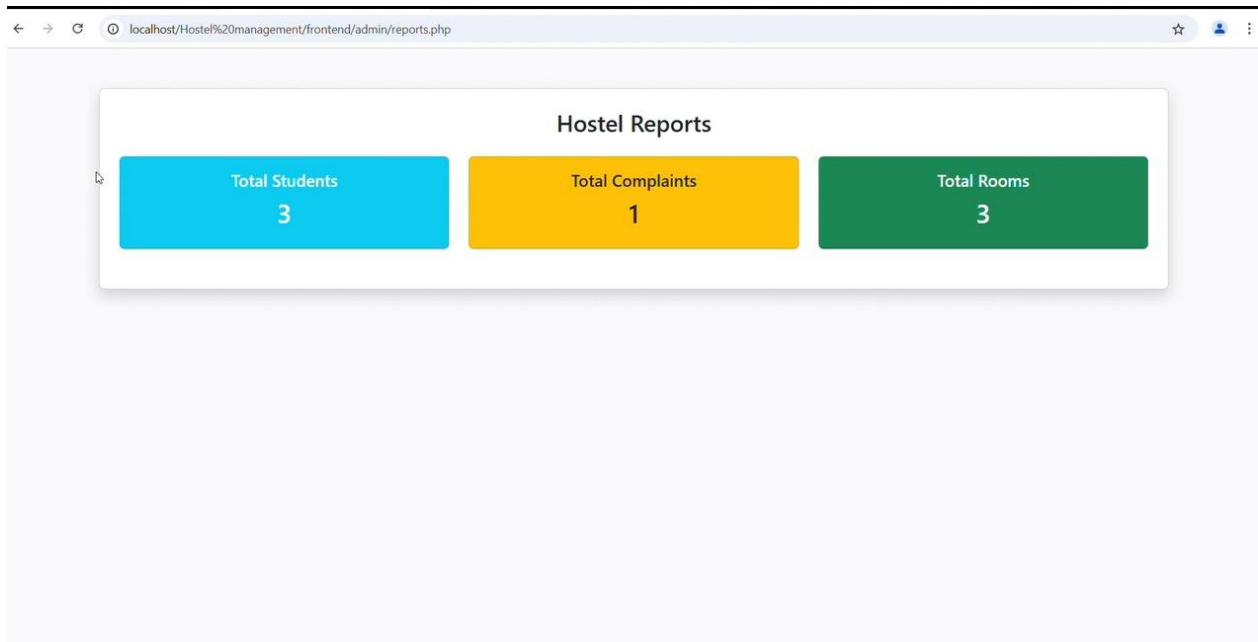
Figure 2: Hostel Reports Page
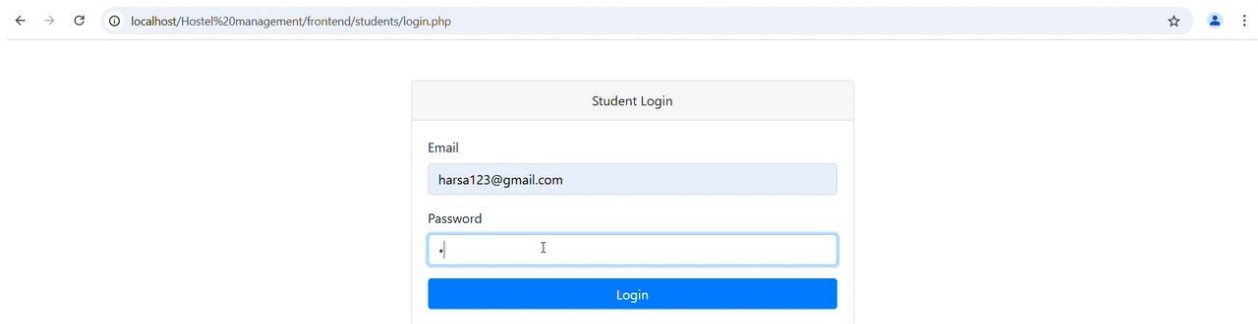
Figure 3: Student Login

Figure 4: Student Dashboard

Figure 5: Leave Application

Figure 6: Complaint Submission

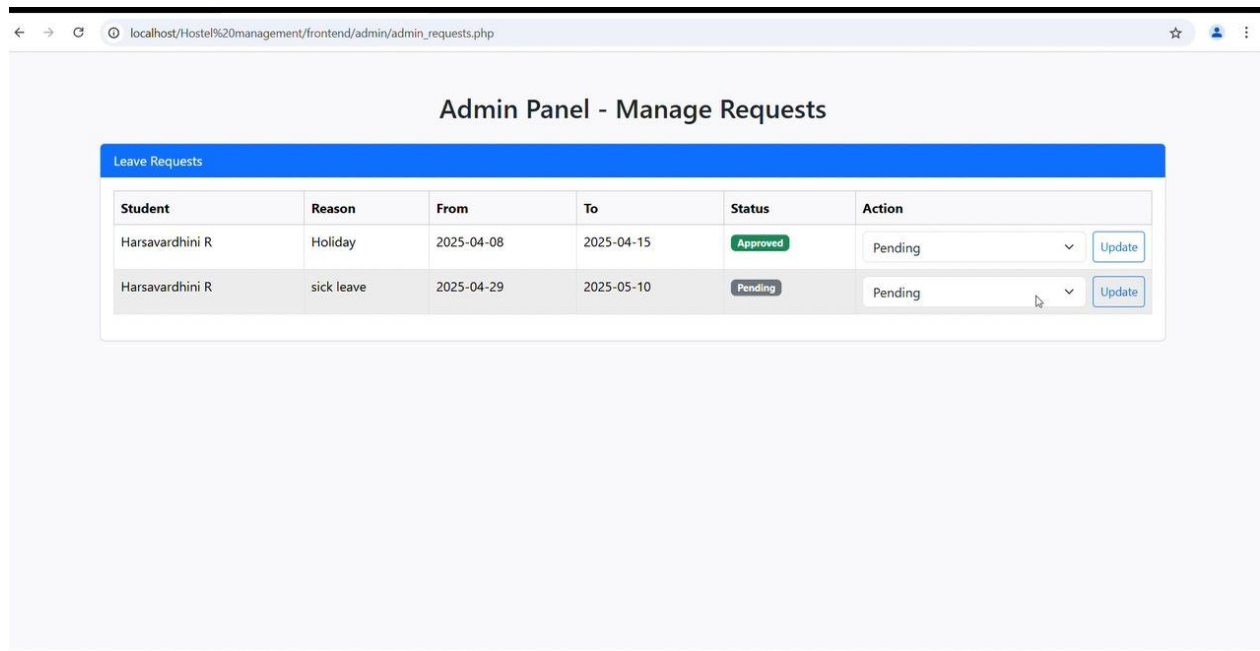Figure 7: Room Booking

Figure 8: Student Profile

Figure 9: Admin Panel

REFERENCES

[1] E. Tarallo, G. K. Akabane, C. I. Shimabukuro, J. Mello, and D. Amancio (2019) "Machine learning in predicting demand for fast-moving consumer goods: An exploratory research," IFAC-PapersOnLine, vol. 52, no. 13, pp. 737– 742. http://dx.doi.org/10.1016/j.ifacol.2019.11.203

[2] G. Mustafa et al., "OntoCommerce: Incorporating Ontology and Sequential Pattern Mining for Personalized E-Commerce Recommendations, (2024)" in IEEE Access, vol. 12, pp. 42329-42342, doi: 10.1109/ACCESS.2024.3377120.

[3] J. Zhang and M. Wedel (2009)"The effectiveness of customized promotions in online and offline stores," Journal of Marketing Research, vol. 46, no. 2, pp. 190–206. http://dx.doi.org/10.1509/jmkr.46.2.190

[4] M. C. Cohen, N. H. Z. Leung, K. Panchamgam, G. Perakis, and A. Smith (2017), "The impact of linear optimization on promotion planning," Operations Research, vol. 65, no. 2, pp. 446–468. http://dx.doi.org/10.1287/opre.2016.1573

[5] R. Fildes, P. Goodwin, and D. Önkal (2019)"Use and misuse of information in supply chain forecasting of promotion effects," International Journal of Forecasting, vol. 35, no. 1, pp. 144–156. http://dx.doi.org/10.1016/j.ijforecast.2017.12.006

[6] K. H. Van Donselaar, J. Peters, A. De Jong, and R. Broekmeulen (2016), "Analysis and forecasting of demand during promotions for perishable items," International Journal of Production Economics, vol. 172, pp. 65–75. http://dx.doi.org/10.1016/j.ijpe.2015.10.022

[7] J. R. Trapero, N. Kourentzes, and R. Fildes (2015), "On the identification of sales forecasting models in the presence of promotions," Journal of the Operational Research Society, vol. 66, no. 2, pp. 299–307. http://dx.doi.org/10.1057/jors.2013.174

[8] J. Henzel and M. Sikora, (2020), "Gradient Boosting Application in Forecasting of Performance Indicators Values for Measuring the Efficiency of Promotions in FMCG Retail," 2020 15th Conference on Computer Science and

Information Systems (FedCSIS), Sofia, Bulgaria, pp. 59-68, doi: 10.15439/2020F118.

[9]   Dr.Sunil Bhutada, Dr.V.Saravana Kumar et al., (2019), "DATA ANALYTICS USED IN BOOSTING THE RETAIL BUSINESS", International Journal of Advanced Science and Technology, Vol 29, no 5, pp. 2776-2790, April 2019.