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Streamlining Hostel Management: An Innovative Online System for Efficient Administration

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Abstract

This article presents a hostel administration system built with XAMPP, which integrates Apache, MySQL, PHP, and Perl into a user-friendly package, in response to the tourism industry's increasing demand for improved management. The system is made to make handling check-ins and check-outs, billing, and room assignment easier, among other hostel management duties. The Hostel Management Framework is an online program designed to oversee various operations in a hostel. This concept aims to streamline the room allocation procedure and reduce manual labor for both hostel administration and students. With the use of this program, students can be selected automatically from the waiting list and easily complete chores like creating outpasses, invoicing for mess, and filing complaints. Additionally, students' emails will be the direct source of approval notifications. With only one click, this method assists parents in staying informed about their children's academic achievement and room and board experience. There is a greater need for more hostels to accommodate students because of the recent rapid growth in the number of educational institutions. Since many hostel administrators are not utilizing the entire range of online resources, this surge places a great deal of strain on them. This project addresses the difficulties of running a hostel and seeks to lessen issues caused by manual work completion.

Keywords: Apache server, MYSQL Database, HTML, PHPS, XAMPP

INTRODUCTION

In the last forty years, the number of educational institutions has increased globally, especially in the last four decades. This progress has made education more reachable for everyone, resulting in greater knowledge and the growth of an informed society that can easily adhere to the standards of a civilized community. Despite this, many new educational institutions continue to use outdated methods for managing their records, particularly regarding hostel management. The efficiency of these organizations is hampered by these antiquated record-keeping procedures. The proposed framework aims to solve the problems associated with these traditional methods of hostel management by providing a user-friendly interface that is visually appealing.

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One online application that can help with a variety of hostel management duties is the Hostel Management System. Because of its intuitive design, managing, automating, and supervising all hostel operations is a breeze. The website's visible components are constructed with HTML and CSS, while its backend functions are handled by PHP and JavaScript. Staff workloads will be greatly reduced by this technique, especially in larger universities with multiple hostels [1-5]. All the duties involved in running hostels can be completed effectively by using this website. The four programming

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languages that were used to develop this website are:

Hyper Text Markup Language

The standard markup language Hyper Text Markup Language, or HTML for short, is used to create web pages and other content that can be viewed in a web browser. Additionally, it has a variety of tags with distinct functions.

Cascading Style Sheet

A straightforward method for applying styles to web pages, CSS stands for Cascading Style Sheet. In essence, it's designed to allow one to discern between a document's presentation—which includes layout, color, and font—and its information.

RELATED WORK

The history of online hostel management systems can be traced back to the late 20th century when computer technology started to integrate into various sectors, including education and hospitality. However, the concept of hostel management systems truly evolved with the widespread adoption of the internet and the advancement of web-based technologies. Here's a brief overview of the history:

1. *Late 20th Century:* The early versions of hostel management systems were offline and primarily based on desktop softwareThese systems were primarily used for simple administrative duties like guest registration, billing, and room assignment, and their functionality was restricted.
2. *Early 2000s:* With the growing popularity of the internet, hostel owners and administrators began exploring online solutions to streamline their operations. The emergence of simple internet reservation systems enabled visitors to book and pay from a distance [1, 2].
3. In the middle of the 2000s, increasingly sophisticated online hostel administration systems started to emerge. These systems had several functions, including guest communication, inventory tracking, real-time booking, invoicing, and reporting. The ability to use these platforms from any internet-connected device made it much simpler for hostel owners to oversee their establishments remotely [3, 4].
4. As technology continued to advance, online hostel management systems became more sophisticated and user-friendly. Integration with other software solutions such as accounting software and channel managers became common, allowing for seamless operations across different aspects of hostel management [5, 6].
5. Throughout this evolution, the primary goals of online hostel management systems have remained consistent: to simplify administrative tasks, improve efficiency, enhance guest experience, and ultimately increase revenue for hostel owners. In order to further automate and customize hostel operations, it is expected that future hostel management systems will further integrate with cutting-edge technologies like artificial intelligence, machine learning, and the Internet of Things (IoT) as a result of ongoing technological advancements [7].
6. *2010s to Present:* The past decade has witnessed significant advancements in online hostel management systems. Cloud- based solutions have become prevalent, offering scalability, flexibility, and enhanced security. Hostel owners and employees can now manage their establishments while on the go thanks to the growing popularity of mobile apps. Additionally, to give both hostel operators and visitors a more complete experience, tools like statistics, social network integration, and guest reviews have been added [8].
7. The Online Hostel Management System was constructed by Magar S et al. of the study [9] using PHP-MySQL source code. Through the simplification of hostel administration duties, this approach lessens the workload for hostel owners and managers. Pen and paper methods, which have been in use for many years, are no longer necessary. In addition to offering crucial information including hostel details, room availability, and financial records, the system tackles the difficulties of manual hostel administration. Because it is an online program, anyone with a functional internet connection can access it with ease from any location.
    - The author of article [10] presented an electronic registration system designed to facilitate the lives of both hostel employees and students. Fewer steps should be included in the

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registration process to improve speed, efficiency, and user-friendliness. The traditional paper-based registration process can be costly and time-consuming. The following benefits have resulted from the significant gains made by e-registration for hostel services:

- Enhanced productivity and decreased the annual cost of printing and acquiring registration materials by reducing redundancies and paperwork.
- Supported the hostel's data administration and student profile integration.
- Presented data on student needs for the hostel, such as tables, chairs, etc.
- Assisted the hostel in easily providing a student's account at any time.

PROPOSED SYSTEM

Three Use Case Diagrams for a Hostel Management System are depicted in Figure 1(a-b), each of which represents the distinct features that are accessible to the various user roles of Administrator, Warden or Employee, and Student. The precise duties and interactions that each user position can carry out within the system are shown in each diagram.

Student Login

This module will have the following features:

- *Student Profile Login:* Only authorized students may access the website's content after confirming their identity using a user account and password.
- *View Profile:* Students are only permitted to view their profiles; they are not permitted to edit them. If they want to make any changes, they must speak with the warden or administration.
- *Change Password:* Students can enter both their old and new passwords to update or change their password.
- *Complaint Registration:* Complaints about the hostel's furniture, plumbing, electricity, and other amenities can be filed by students. The administrator or warden will send the student a letter message as soon as it is confirmed.

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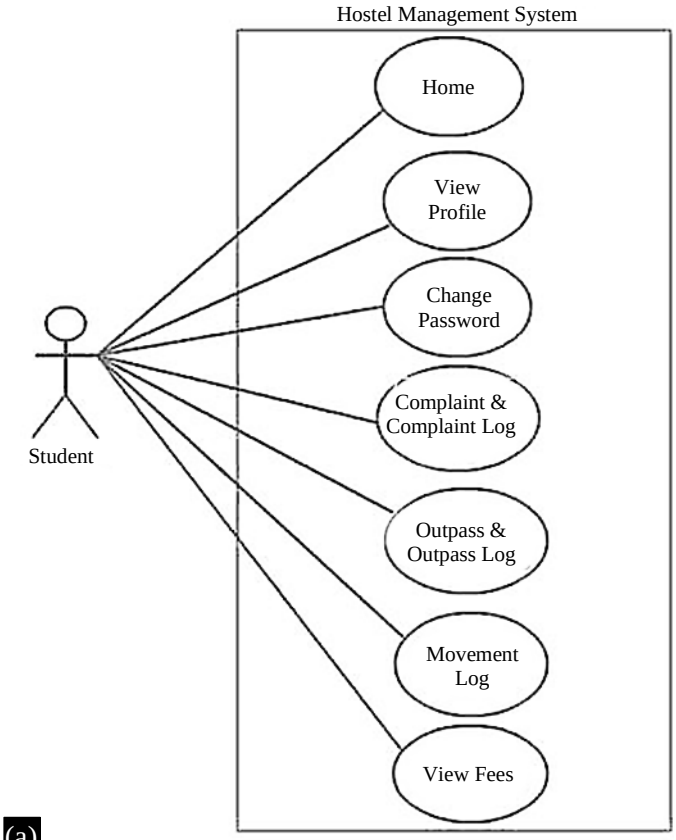

(a)

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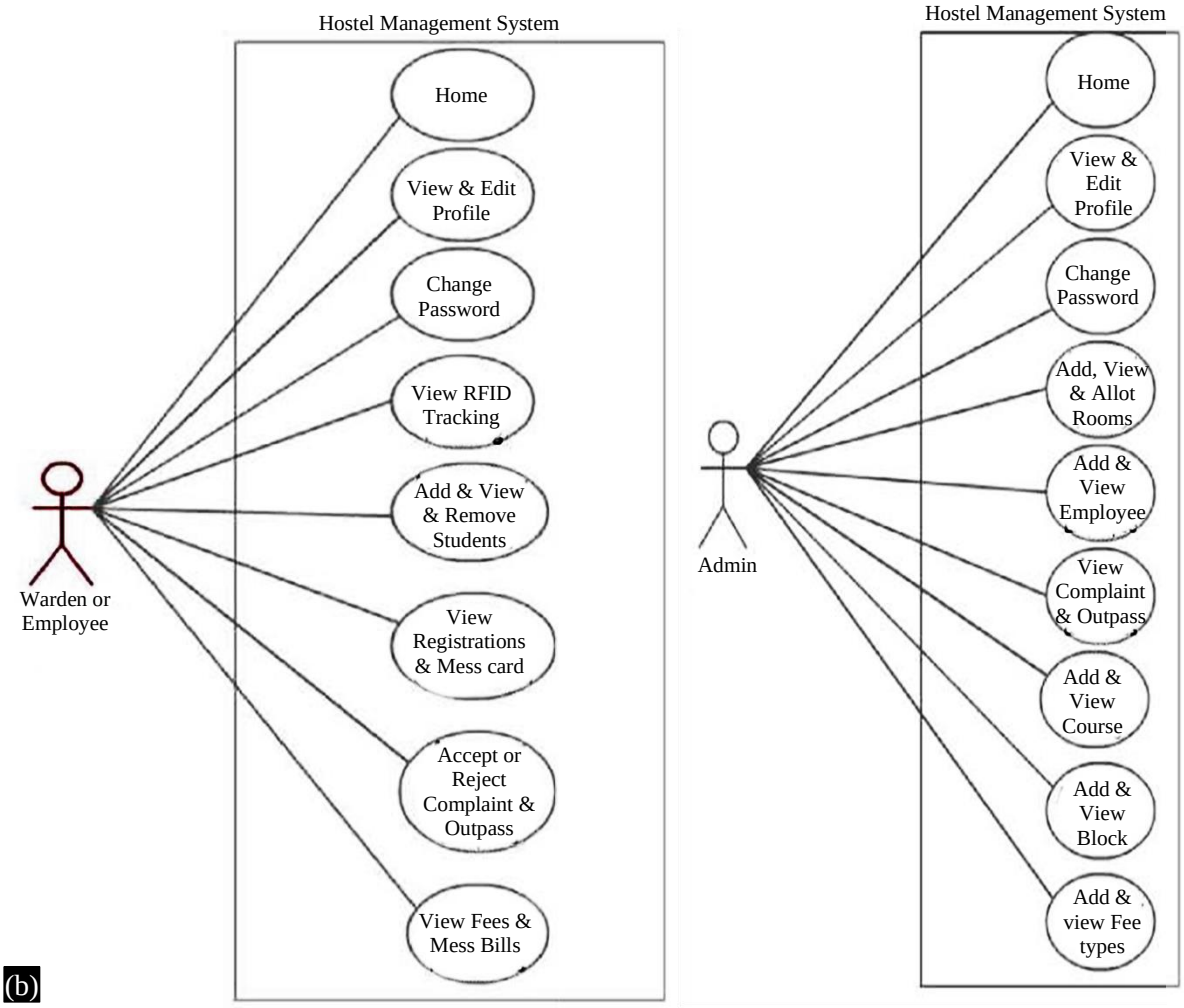

Figure 1. (a and b) Block schematic of the online hostel management system.

- *Outpass Application:* students can apply for the outpass needed to leave the college for an outing. The administrator or warden will send the student a letter message as soon as it is confirmed.
- *Outpass Log:* Students can see their logs pertaining to their outpass status via this function.
- *Complaint Log:* Students can view the status of their complaint logs on this page.
- *Movement Log:* This page lists the number of times the student left the hostel and returned, along with the time and date.

Warden Login

- The features of this module will be as follows:
- *Login to Warden module:* Only authorized users who have verified their identity by supplying their user account and password are permitted access to the website's contents.
- *Profile:* The user can visit and edit their profile to make any necessary adjustments. They can also change the old password if they require it.
- *Rooms:* Many functions are available on this page. Here, users can change or delete rooms, create rooms, assign rooms to students, and check room allocation.
- *Students:* Students can be managed by the user on this page. Students can be added, their information updated, and a mess card added. They can also use an RFID device to follow the student's movements [6].
- *Reports:* The reports feature allows users to accept or reject student applications for outpass and complaints. They can also create reports on hostel costs, mess bills, and mess cards.

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Admin Login

The functions of this module include the following:

- *Login to administrator module:* Only authorized users are permitted to view the website's content after confirming their identity with a user account and password.
- *Profile:* The user can visit and edit their profile to make any necessary adjustments. They can also change the old password if they require it.
- *Rooms:* Here, users can add, assign, and review rooms, as well as change or remove rooms for students.
- *Students:* Students can be managed by the user on this page. Students can be added, their information updated, and a mess card added. They can also use an RFID device to follow the students' movements.
- *Employee:* The administrator is the only person with the power to add and manage employees.
- *Reports:* Users can accept or deny student applications for outpass and complaints in reports. They can also create reports on hostel costs, mess bills, and mess cards.
- *Mess Schedule:* The daily mess routine can be altered on this page, and the student profile will reflect the changes.

FUTURE SCOPE AND ITS APPLICATIONS

The future scope of online hostel management systems is promising, with opportunities for innovation and integration with emerging technologies. The following are some prospective uses and developments for the future:

1. *Artificial Intelligence (AI) and Machine Learning (ML) Integration:* AI and ML algorithms can be integrated into hostel management systems to analyse data, predict demand, optimize pricing, and personalize guest experiences. Artificial intelligence (AI)-powered chatbots can answer consumer questions and automate repetitive processes, increasing productivity and guest pleasure.
2. *Internet of Things (IoT) Integration:* IoT devices such as smart locks, occupancy sensors, and energy management systems can be integrated with hostel management systems to automate processes, enhance security, and optimize resource utilization. For example, smart locks can enable keyless entry for guests, while occupancy sensors can automatically adjust room temperatures and lighting based on guest presence.
3. *Contactless Solutions:* The hospitality industry's need for contactless solutions has grown as a result of the COVID-19 pandemic.
4. Online hostel management systems can incorporate contactless check-in/out procedures, mobile key technology, and digital payments to minimize physical interactions and ensure the safety of guests and staff.
5. *Enhanced Analytics and Business Intelligence:* Future hostel management systems are likely to offer advanced analytics and business intelligence capabilities, providing insights into guest preferences, market trends, and operational performance. This data-driven method can help hostel operators identify areas for development, optimize revenue sources, and make educated decisions.
6. *Blockchain Technology:* Blockchain technology can be used to improve hostel management systems' security, openness, and credibility. To lower the risk of fraud and conflicts, blockchain-based smart contracts, for example, can enforce terms and conditions and automate booking transactions.
7. *Virtual Reality (VR) and Augmented Reality (AR) Experiences:* Hostel management systems can incorporate VR and AR technologies to offer virtual tours of hostel facilities, interactive maps, and immersive guest experiences. This can help attract potential guests, showcase unique features, and differentiate the hostel from competitors.
8. *Sustainability Initiatives:* As the hospitality sector grows more concerned with sustainability, future hostel management systems might incorporate tools to monitor and encourage environmentally friendly behaviors like waste minimization, energy conservation, and ethical sourcing. By doing this, the hostel can attract eco-aware visitors and enhance its reputation.

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9. Overall, the future of online hostel management systems lies in leveraging technology to improve operational efficiency, enhance guest experiences, and adapt to evolving industry trends and consumer preferences. In a market that is becoming more digital and dynamic, hostel operators can maintain their competitiveness by embracing innovation and new opportunities.

METHODOLOGY

The methodology for developing an online hostel management system involves several key steps. Initially, thorough requirement analysis is conducted by consulting with hostel stakeholders to understand their needs. This informs the system design phase, where the architecture, technologies, and user interfaces are defined. Development then proceeds, encompassing backend logic, frontend interfaces, and integration with third-party APIs. Testing ensures reliability, security, and performance, followed by deployment to a production environment with monitoring and backup mechanisms in place. Adoption tactics and user training are used to promote a seamless transition and use. Ongoing maintenance, support, and iterative improvements complete the lifecycle, ensuring the system remains efficient and aligned with evolving requirements and industry trends. The development of a strong and intuitive online hostel administration system is guaranteed by this all-encompassing strategy. The login page and dashboard for the online hostel management system is shown in Figures 2 and 3.

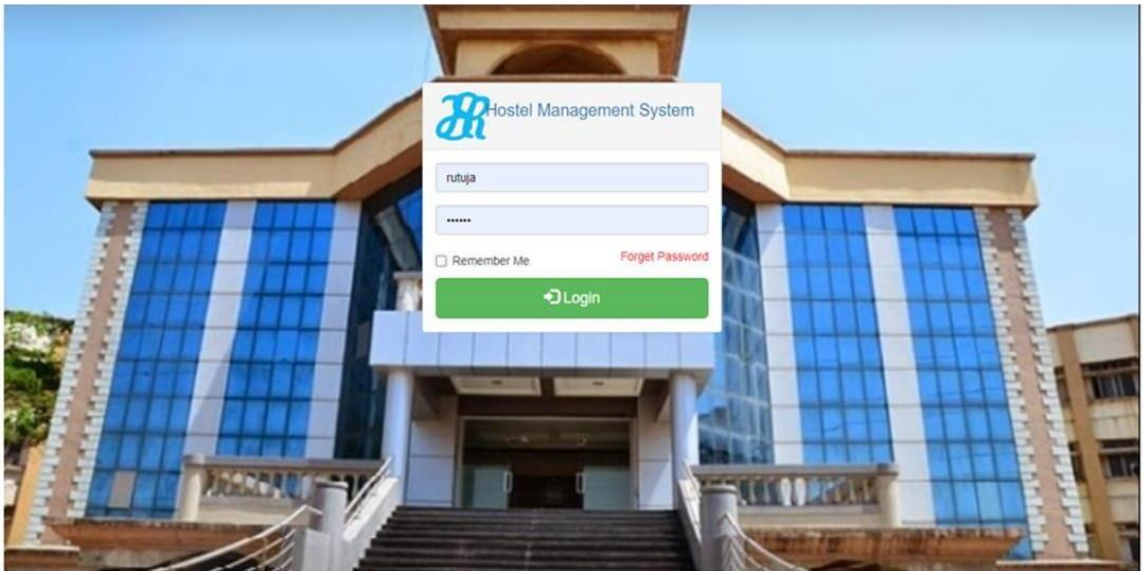

Figure 2. Display the login page of online hostel management system.

Figure 3. Display the dashboard of online hostel management system.

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CONCLUSION

Conclusively, the process of creating an online hostel management system is complex and involves careful preparation, teamwork, and patience. By following a structured methodology encompassing requirement analysis, system design, development, testing, deployment, user training, and ongoing maintenance, a robust and user-friendly system can be created to streamline hostel operations and enhance guest experiences. Embracing emerging technologies, such as AI, IoT, and blockchain, along with a focus on sustainability and contactless solutions, can further elevate the system's functionality and appeal. Ultimately, the successful implementation of an online hostel management system empowers hostel owners and staff to efficiently manage their properties while providing guests with a seamless and enjoyable stay. Through continuous monitoring, support, and iterative improvements, the system can adapt to changing needs and trends, ensuring its long-term effectiveness and relevance in the dynamic hospitality industry.

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