International Journal of Advanced Engineering and Management Research

Vol. 10, No. 02; 2025

ISSN: 2456-3676

Web-based Hostel Reservation and Location Identification System Using IOT

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doi.org/10.51505/ijaemr.2025.1103 URL: http://dx.doi.org/10.51505/ijaemr.2025.1103

Received: Feb 19, 2025 Accepted: Mar 03, 2025 Online Published: Mar 16, 2025

Abstract

There has been an unbelievable increase in hostels with the rise of educational institutions in Pakistan. Nevertheless, finding the best hostel for yourself in the nick of time is hard. Students are still using the old techniques of finding hostels via GPS and visiting them personally to see if a hostel matches their requirements. Besides, hostel owners who are not located in commercial areas must wait a long time for customers. To relieve the students and hostel owners, we have developed a hostel reservation and location identification system named Auberge Reservations. Auberge Reservation is a website application that aims to provide an online and computerized facility to students for locating a hostel of their choice and the hostel owners a platform to catch good enough students timely. The project aims to solve the problem of uncovering the best hostels for students in neighboring areas and revealing the central hostel systems according to students' essential needs. The goal is to develop the finest hostels with all their vital particulars. Besides, the website will allow the students at distant places to reserve their hostel room in advance without visiting physically. Additionally, the webpage will provide the best prices along with the facilities offered by the hostels. The iterative waterfall model and Oriented Programming (OOP) methodology are used as development methods throughout the Software Development Life Cycle (SDLC) process. Visual Studio is used as software for the project development. For front-end development, HTML, CSS, Bootstrap 5, JavaScript, and JQuery are used, while for backend development, PHP language is utilized, and Laravel is used as a framework due to its flexibility and being open source.

Keywords: online hostel reservation, hostel management, web application, reliable, efficient

1. Introduction

The present need for automation in multiple industries demonstrates that utilizing manual hostel reservation and management processes remains inefficient and primitive (Aqeel et al., 2024; Aqeel et al., 2020). Today, students who need accommodation need to see numerous hostels in person and make calls to each place because hostel owners still handle their properties through

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manual labor. The manual system creates unnecessary inconvenience that leads to repetitive work and problematic data management, as well as challenges with student room occupancy tracking and detailed monitoring of student information (Yu, 2012; Choudhury et al., 2017a). The extended time needed for accommodation searches goes beyond one day, which creates difficulties for students to find suitable housing quickly (Aqeel et al., 2023).

Unreliable data collection occurs because there is no centralized hostel management system in place. The proper maintenance of student records in hostels remains poor because manual recording processes result in time-consuming updates and require frequent disposal of old documents (Ayanlowo et al., 2014). Lack of exposure becomes a major concern for owners of hostels that do not benefit from high-traffic locations because they heavily depend on person-to-person recommendations for promoting their facilities (Bemile et al., 2014). To meet current needs, a digital solution must be developed that streamlines hostel booking procedures and handles efficient record management for students as well as hostel managers (Castro & Custodio, 2016).

This study introduces Auberge Reservations, which provides an internet-based hostel reservation service together with location identification capabilities. This hostel reservation and location identification system allows the hostel admins to keep a record of students' information residing in their hostel. The room number and the time they live there will also be recorded (Ian, 2014). Instead of physically visiting every hostel or compromising on the only available hostels with fewer facilities in the surrounding, an online hostel reservation and location identification service will allow far-flung hostel students to book their rooms near their institutes without even visiting (Verma, 2021).

1.1 Importance of the Problem

The introduction of an automated hostel reservation system results from the performance deficiencies and operational boundaries observed in standard procedures. Students encounter major difficulties while seeking appropriate accommodations, along with checking amenities and booking their accommodations promptly. The problem grows essential for education-seeking students moving into new cities because they lack awareness about available hostels, which creates both distress and confusion (Sofiya, 2018). Students attending educational institutions in smaller cities usually remain uninformed about all the hostel options located near their campus.
This research finds its motivation in the well-known proverb that describes necessity as an inventor. Hostel accommodation demand growth requires a customizable online booking system that simplifies reservations while offering easy access because existing manual systems are showing their limitations (Shah et al., 2003). Digital solutions continue to advance throughout various industries, which makes it pragmatic to introduce them within hostel reservation systems. Research initiatives about hostel management programs have mainly concentrated on digitalizing administrative procedures. Auberge Reservations serves as a complete web-based solution that supports scalable hostel reservation capabilities along with location identification features. The system was created to serve one urban area but shows potential as a national program. Auberge

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Reservations delivers a complete dynamic platform supporting multiple vendors, which enables users to search and book hostels along with online payment capabilities. Through the system, students can now find accommodation without traditional physical visits, and hostel proprietors gain improved reservation and occupancy management features.

1.2 Relevant Scholarship

Research investigations focus on developing web-based hostel management systems that enhance operational efficiency while solving the issues of manual processing. Ainon et al. (Ainon & Rosmaizura, 2018) proposed a user-friendly computer-based hostel management system to automate, manage, and oversee record processing for the students residing in a large hostel. Using the web, one can manage enquiry details, student details, payment details, etc. The system solves manual hostel management issues by providing hostel information, room information, and hostel account data. Stability, cost-effectiveness, and usability were the essential features of the software. Moreover, it offers hostels with the most customizable and versatile standard management solution.

Emmanuel and Ayaka Akolo (Emmanuel, 2015) proposed the design and implementation of an online hostel management system using a PHP-based hostel administration platform at the College of Agriculture Lafia, Nigeria, for online hostel reservations and to allow the staff to handle hostel applications. The suggested system was faster and efficient with the following advantages: applying for a hostel via the internet, information management, acceptance of online hostel applications, checking the status of an online application, and sending an application alert to students via text message. This system provided more efficient operations than standard practices yet failed to offer capabilities for digital payments together with visitor tracking and food service management.

The Babcock University in Nigeria developed a university management information system for hostel allotment request processes. Students could reserve their hostels through the platform by choosing between various room types, meals, and worship spaces (Ashesh & AppaRao, 2020). The system development used HTML together with CSS, JavaScript, C#, and MySQL as programming languages. Although the system enhanced the selection and administrative capabilities of hostels, it failed to establish either an availability tracking mechanism or integrate automated hostel identification by location.

Mothe et al. (Mothe et al., 2015) built an online dormitory reservation system that lessened both student and hostel administrator workload by eliminating manual procedures. Adenowo et al. (Adenowo et al., 2013) developed a system for hostel reservations through a combination of the waterfall model and object-oriented programming (OOP) framework. A qualitative research survey conducted by the authors obtained information regarding the number of residents and peak usage times along with hostel facilities. These studies used structured methodologies, yet they failed to develop an integrated system that merged hostel discovery with online reservations and automated administration under one platform. There are still challenges in achieving an

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efficient and effective web application covering all the essential functionalities for students and hostel owners, and these need to be addressed (Gate, 2017).

The development of Auberge Reservations emerged as a complete web-based product to overcome the shortcomings of prior hostel reservation systems. Students can accomplish hostel searches remotely through the platform, which allows them to browse and contrast different options and perform online bookings while eliminating the requirement for physical hostel visits. The system was initially intended for one city, but it shows potential to spread nationwide. The real-time tracking system of Auberge Reservations combines features such as location monitoring with the capability to accept online payments to serve hostel owners and administrators along with students through its multi-user platform. Users can access the application through an internet connection because it operates as a web-based platform without needing any software installations for desktop or mobile devices.

1.3 Hypotheses and Their Correspondence to Research Design

This study is guided by two major hypotheses:

- Primary Hypothesis: The combination of web-based hostel reservations with IoT-based location tracking enhances hostel booking and discovery processes through improved efficiency compared to manual operations.
- Secondary Hypothesis: Hostel owners and students will achieve better satisfaction through the combination of digital payment systems integrated with automated reservation management.

The researchers employ a structured software development life cycle (SDLC), which uses the iterative waterfall model to test these hypotheses. The progressive methodology provides organizations with an organized path to move smoothly between requirement assessment and design work and implementation tasks and quality assurance steps and platform deployment activities. The system implements object-oriented principles, which creates a modular structure and scalability along with user need adaptability.

This research aims to develop a system for hostel owners and students who reside in hostels during their education. The hostel owners and students are provided with separate account options (Kondrateva, 2019). Student hostel owners can log in using Student and Hostel Owner windows, as shown in Fig. 12 and Fig. 13. The hostel owner needs to fill in all the details of the hostel and submit it for admin approval. After receiving support from the admin, the hostel owner will be provided with an account that allows them to edit the hostel description, including room rent, room size, number of beds, Wi-Fi facility, and other features. The hostel owner may accept or decline the online reservation request. It is an automated system that will enable users to search for the availability of rooms in any hostel and book them remotely. The proposed approach reduces the efforts of the students and hostel owners.

This work is focused on saving the time and money of students and providing a platform for the hostel owners to advertise their hostels to a large audience using a web application. Visual Code

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Studio and Bootstrap are developing tools that allow the developer to use various web development technologies, including CSS, JavaScript, HTML, and other popular ones that the browser handles (Sudarsono, 2020). The system will use MySQL to store data and PHP Laravel as a backend language for website development (Ashesh & AppaRao, 2020). With the implementation of this idea within a specific city, the students need not worry about locating the hostels and roaming to find one that matches their financial and essential requirements (Aysha & Husna, 2022). Cash payment and credit card payment methods are still the challenges in online hostel reservation systems. Herein, we implemented payment methods, including cash payment and credit card payment. Auberge Reservations is a fully dynamic multi-vendor web-based application that facilitates students, hostel owners, and super-admins. Google Maps has also been integrated into the web application for the location identification of hostels.

The study implements these features to prove that a self-operating hostel reservation system increases accessibility while lessening administrative workloads and streamlining the entire booking process. The research data will push forward the development of digital accommodation management systems while delivering a base for upcoming progress in online rental and lodging platforms.

2. Methods

Object-oriented analysis requires the analyst to examine all of the objects in a system, their similarities and differences, and how the system manipulates the objects. These parameters serve as the foundation for the Object-Oriented Modeling (OOM) of construction systems. First, the development system is monitored and analyzed, and the needs are determined. Second, the items in the needed system are identified, such as students, administrators, computer systems, online allocation systems, and so on. Simply said, OOM is predicated on identifying the objects in a system and their interrelationship; once this is done, the system is implemented. The following are the fundamental steps in system design using OOM:

- System Evaluation
- Design of a System
- Design of Objects
- Implementation

2.1 Methods of Data Collection

The method through which data acquired by a searcher is methodically gathered and analyzed. Typically, multiple data sources are evaluated:

2.1.1 The primary information

It generally focuses on direct contact with people and experts in the subject of discipline on which the researcher is currently conducting the study. The primary method for gathering preliminary evidence for this study's work is:

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- Interview: The student services officer and several students were asked, and since there are no anticipated statistics or data, the accuracy rate of acquiring information from the data is considerable. The evidence received is believed to be accurate. The assignment of an oral questionnaire to survey participants was intended to assist the researchers in gaining leverage ground of the technological background of the influence of web use, particularly at a public sector university as a case study in this research.
- Reflective observation: Personal experience of the Khwaja Fareed University of Engineering and Information Technology routine supplements the interview.

2.2 Secondary Data Sources

The usage of library services as a secondary source of information for this study includes textbooks, former team projects, the internet, and certain other relevant materials. This form of data collection was used to extend the scope of the research conducted and to investigate literature work. It showed what has already been provided to contribute to the issue under examination.

Table 1 shows the survey data in which a number of people were interviewed regarding their point of view about hostel accommodation. The demand and need of this application can be calculated by the ratio of agreed people to those who do not agree. The provided data in favor of hostel accommodation by a large ratio of people encouraged the development of the Auberge Reservations website.

Table 1. Survey Table

Category	Number of people under surveys	People who want hostels	People who do not want hostels	Is the survey helpful?
Students	60	35	10	Yes
Faculty	35	29	6	Yes
Workers	20	15	5	Yes
Visitors and guests	f	7	3	Yes

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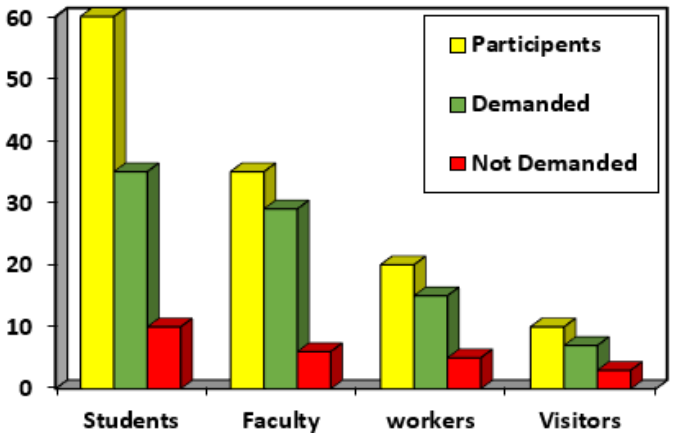

Fig. 1. Survey chart

2.3 Methodology

The methodology used for the proposed system was the object-oriented methodology (OOP), applied to students, hostel owners, computer systems, etc. Many popular languages, packages, and techniques were used for developing the web application, including CSS, HTML, NPM, Bootstrap 4, JavaScript, jQuery, and AJAX. The web application uses the PHP Laravel framework. The three-tier software application architecture has used the process, manage and store the data. The data tier uses MySQL for the database, the presentation tier uses business logic, and the application tier provides a view to the user.

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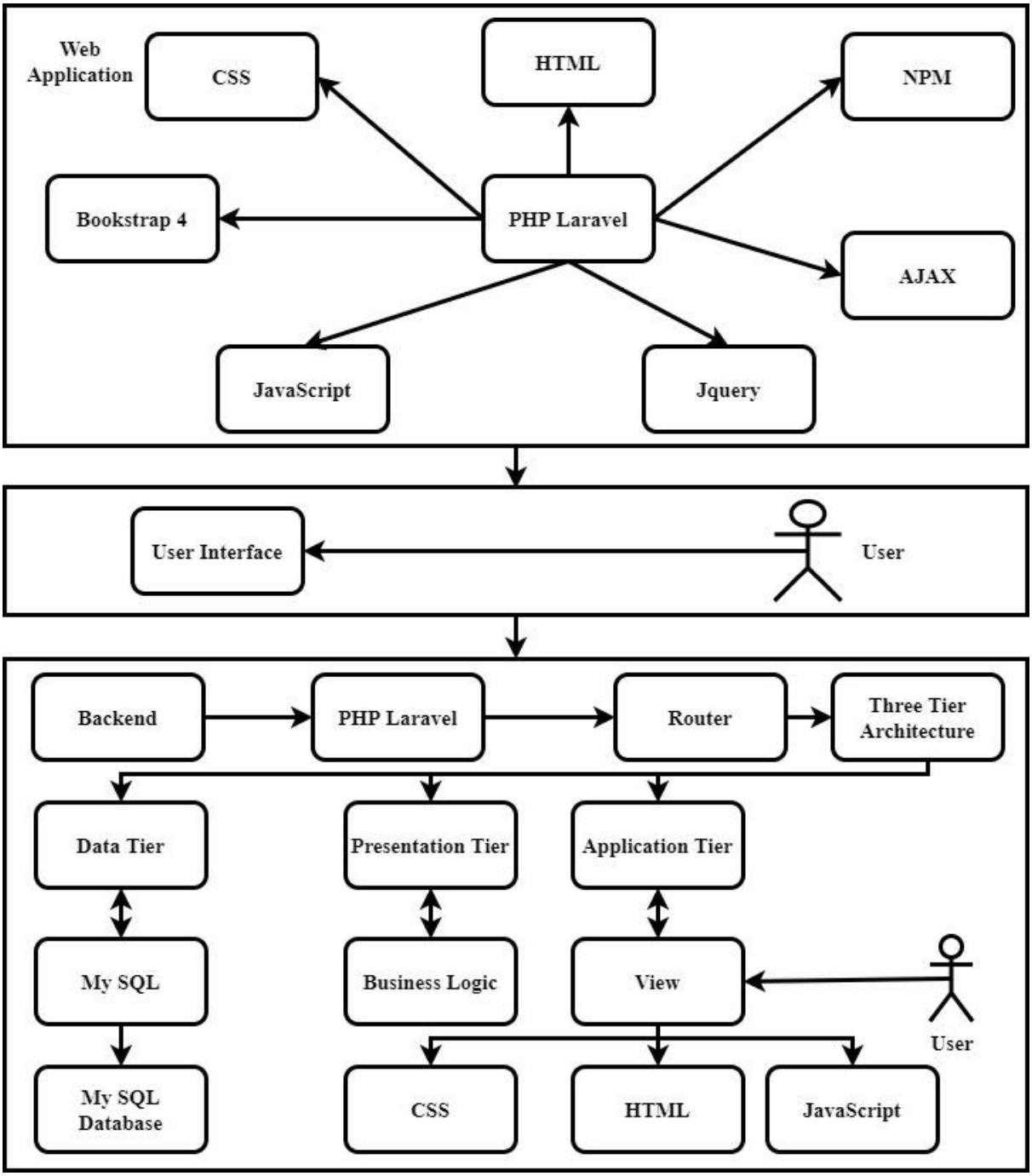

Fig. 2. Proposed methodology

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2.3.1 Backend and Three-Tier Architecture

We have used PHP language for server-side development using the Laravel Framework. The backend was divided into three-tier systems, as shown in Fig. 2. A three-tier structure allows each layer to be modified or upgraded individually. These three tiers are defined here:

2.3.1.1 Presentation Tier

The first tier related to presentation is the program's communication layer and UI, where the ultimate users can interact with the application. Its primary function is to present information and gather data from the end-user. This top-level layer, for illustration, can operate in a web browser as a PC program or as a graphical user interface (GUI). Tiers of web representation are often built in HTML, CSS, and JavaScript. Depending on the platform, computer applications may be produced in various languages. The presentation tier of Auberge Reservations has been presented in the results and discussion section.

2.3.1.2 Application Tier

The second layer is related to the application, also known as the "middle tier" or "logic tier," which can be called the software's heart. This layer processes the data acquired in the presentation layer, often against additional information inside the information tier, utilizing business logic and perhaps a particular set of business requirements. The application tier could also add, delete, or modify the data tier. The application layer is usually written in PHP, Python, Perl, Ruby, and Java and interferes with the data tier via an API call system. All communications in a three-tier system pass through the application tier. Auberge Reservations uses PHP language as an application tier and Laravel as a framework.

2.3.1.3 Tier of data

The third layer is related to the data tier, also known as the backend database tier or data access tier, or where the software's data is maintained. This might be an RDBMS like Oracle, PostgreSQL, MariaDB, Microsoft SQL Server, or MySQL, or a NoSQL database server like CouchDB, Cassandra, or MongoDB. The display and data tiers could not be connected straightforwardly. We used MySQL relational data in Auberge Reservations as a Data tier. All the data of students and hostel owners were kept saved in the data tier.

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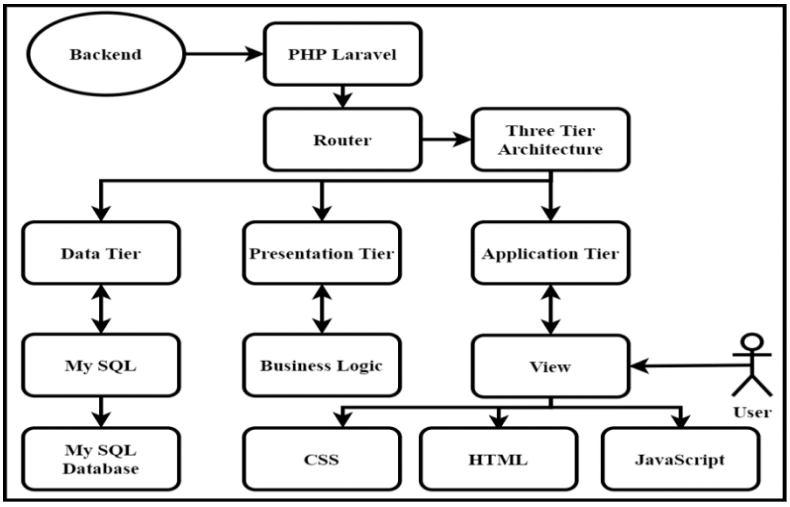

Fig. 3. Three-Tier Architecture

2.3.2 User Interface Diagram and Components

2.3.2.1 User Interface

A system's User Interface (UI) is a set of communication and interaction tools between humans and computers, such as keyboards, display screens, mice, etc. That is how UI with a program or a website is used. Menus, windows, buttons, icons, and scroll bars are examples of GUI elements. Music, speech, motion picture, and VR technology have rapidly become the GUI for several apps. At the same time, the adoption of multimedia as a component of GUI and some other components used to make UI are given in Fig. 4.

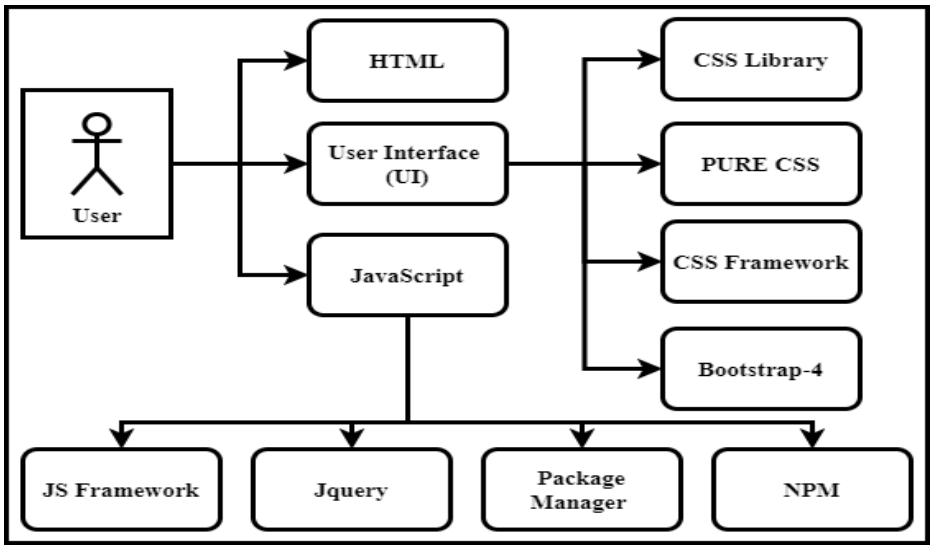

Fig. 4. User-Interface Diagram

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2.3.2.2 HTML

Hyper-Text Markup Language (HTML) is a computer language that allows for the building of websites. HTML contains code words and grammar like every other language and is very simple and easy to understand. It continuously improves with the passage of time. The process through which web users browse the web is known as hypertext. End users are directed to new pages via clicking over particular text known as hyperlinks. Since it is not linear due to hyper usage, individuals may get anywhere on the web just by hitting the accessible links.

2.3.2.3 CSS

Cascading Style Sheets (CSS) is a language for style sheets used to specify the appearance of an XML or HTML document. CSS specifies how items should be displayed on screen, on paper, during a speech, and in other mediums. CSS is one of the free basic web languages and is standardized across internet browsers as per W3C guidelines. Distinct portions of the CSS standard were developed simultaneously, allowing for the versioning of the most recent suggestions, CSS1, CSS2.1, and CSS3. However, in any case, CSS4 has not been made an official version. We can write CSS in 3 ways: Inline, Internal, and External. We wrote CSS in the external form, and comments clearly defined every section and page of CSS.

2.3.2.4 JavaScript

JavaScript is a programming language or scripting interface that enables users to integrate advanced structures on website pages. Whenever a new website does more than taking a seat there and exhibits static data for you all to glance at — displaying quick and efficient content, latest updates, detailed maps, 2D/3D animated graphic elements, scrolling video record players, etc. — JavaScript is associated. That is the third Tier of a layer cake of standard web applications. The first two (CSS and HTML) have been discussed in considerably more depth in other learning areas. We used JavaScript for front-end purposes only. Some animations and charts were also implemented on the website using JavaScript.

2.3.2.5 Bootstrap

Bootstrap is the framework for front-end programming used to create web apps and websites that are open source and free. The Bootstrap approach is founded on CSS, JavaScript, and HTML to make it easier to create responsive, mobile-first apps and sites. Responsive structure makes a website or application possible to recognize the visitor's display size and shape and dynamically modify the appearance. The mobile-first strategy expects to use phones, tablets, and task-specific devices. There are five versions of Bootstrap, Bootstrap 5 being the latest one, but we have used Bootstrap 4 as it has more functions and is more reliable than Bootstrap 5.

2.3.2.6 jQuery

jQuery is a JavaScript library that is open source, making it easier to create and navigate online applications. jQuery makes HTML Document Object Model (DOM) manipulation,

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Asynchronous JavaScript and XML (AJAX), and event handling easier. jQuery also combines JavaScript functionality by modifying CSS attributes to provide features such as fade-ins and fade-outs for page components. jQuery is a popular JavaScript library with hundreds of user-created plug-ins. Users may also edit the characteristics of elements and respond to events. jQuery may utilize AJAX to send data across servers and browsers without reloading the page. An event handler, which accepts an object in response to the event, provides event processing. To avoid the event's consequences, the event handler defines the kind of event and performs a DOM component function. jQuery's selector engine, Sizzle, provides the syntax for such simplifications. Sizzle is a CSS selector engine that can search DOM elements for specified items. We used jQuery for front-end purposes in our web application, the Auberge Reservations.

2.3.2.7 NPM

Node Package Manager (NPM) has been the standard package manager for "Node.js", the runtime JavaScript. NPM is divided into "command-line interface (CLI)" tools for downloading and publishing packages and an online repository containing JavaScript programs. For illustration purposes, imagine the repository npmjs.com as just a fulfillment center that accepts packages of products from vendors (NPM package writers) and delivers them to purchasers (NPM package users). We installed the NPM package using the command line "NPM install" and "NPM run dev" before initializing the project in the VS Code terminal.

2.3.3 Waterfall Model

A waterfall model is used for the development of this software. The waterfall model's methodology was coherent with our idea. For the software development, the process was divided into different phases, and the output of the previous stage was used as an input for the next step. All the requirements were gathered and documented clearly. There are no cryptic demands of the project. We used the waterfall model throughout the project lifecycle. This traditional model works sequentially, and once a stage is completed, there is no way back to revisit that step (Adenowo et al., 2013).

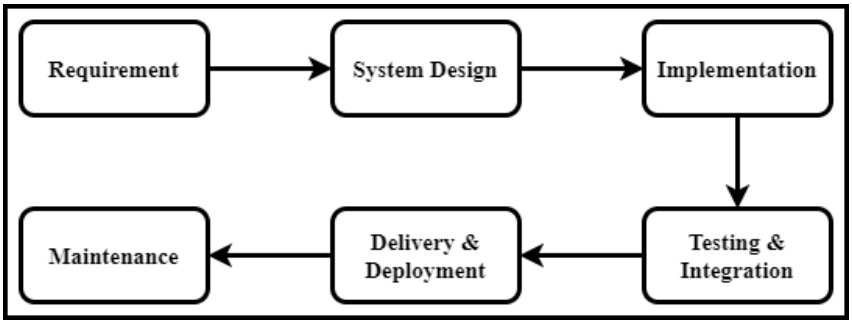

Fig. 5. Waterfall Model

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2.4 Design

2.4.1 Methodology Diagram

The methodology diagram provides a simple illustration of the activities that the user can carry out. After registration and authentication by the hostel management, the hostel owner can view the student's applications. The owner will be able to accept or decline the request for room allotment. On the other hand, after signing up, the students can log in to their panel to search the hostel via location and budget options. They can reserve a hostel of their choice remotely.

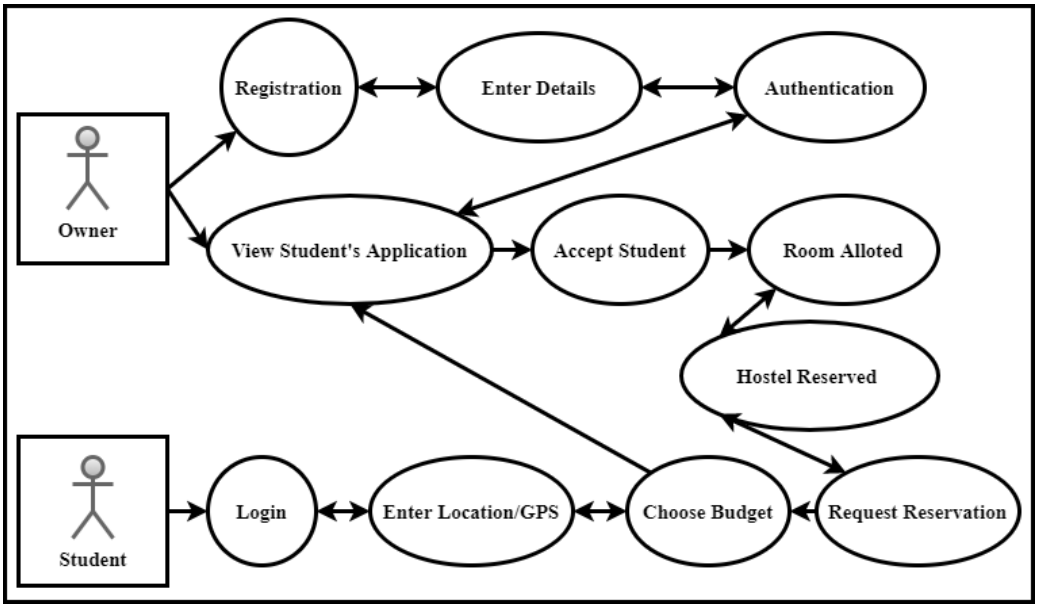

Fig. 6. Methodology Diagram

2.4.2 Block diagram of proposed system

The block diagram of Auberge Reservations represents the functions as shown in Fig. 7. The blocks and lines represent parts of our system that describe the relationship between functions. The system has three main panels: the admin panel, the hostel panel, and the student panel. After signing up, the user will log on to its registered panel to view the contents on the website. All the panels have different features. The student panel allows the user to check the hostel categories, location, hostel details, and payment method. The hostel owner can register the hostel, edit details of the hostel, and allow the rooms to the clients. Hostel owners can also apply for paid promotions. On the other hand, the admin panel is provided with the functionality for allowing or declining hostel requests and a report generation facility.

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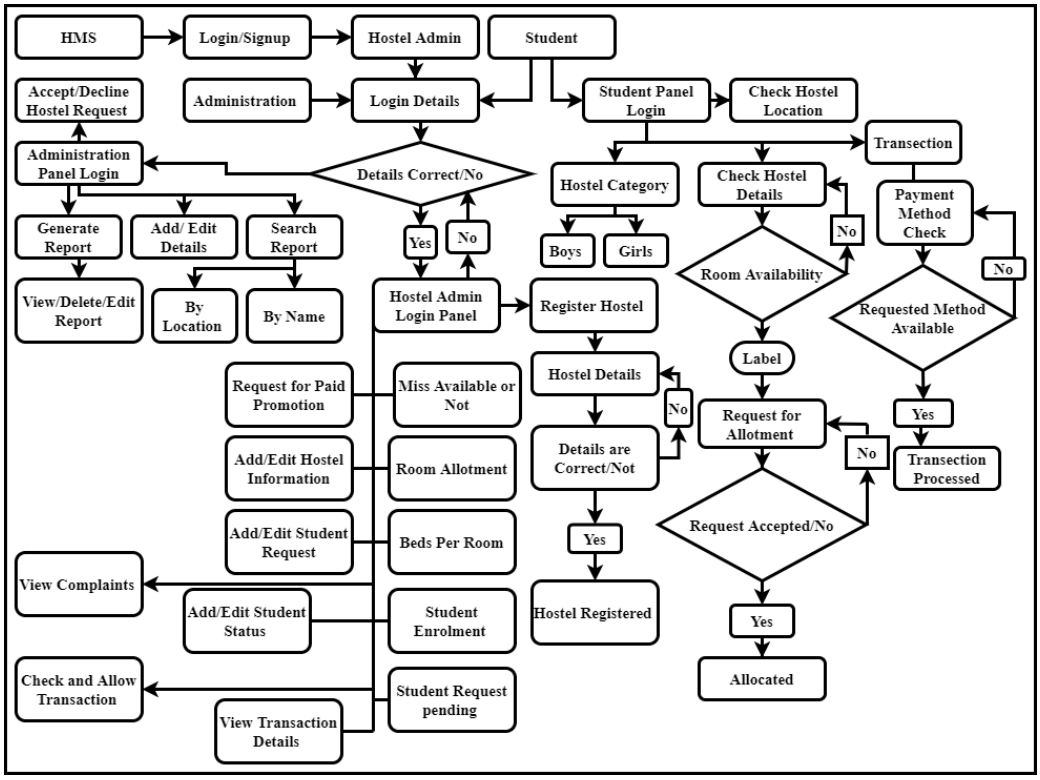

Fig. 7. Block Diagram

3. Results and Discussion

The system modules and how they work together are listed for understanding the website operation.

3.1 Homepage

Figure 8 shows the home page of the Auberge Reservations website. It consists of a logo and various icons. The ABOUT icon provides the information about the website that is necessary for the users. The SERVICES page shows different services offered by different hostel owners, such as food, internet, laundry, air conditioning, reserved parking, etc. The ROOMS icon displays different rooms at different hostels for the users to choose from. From the icon OUR TEAM, one can contact any team member for a query or help. There is a CONTACT page that allows the users to contact the admin.

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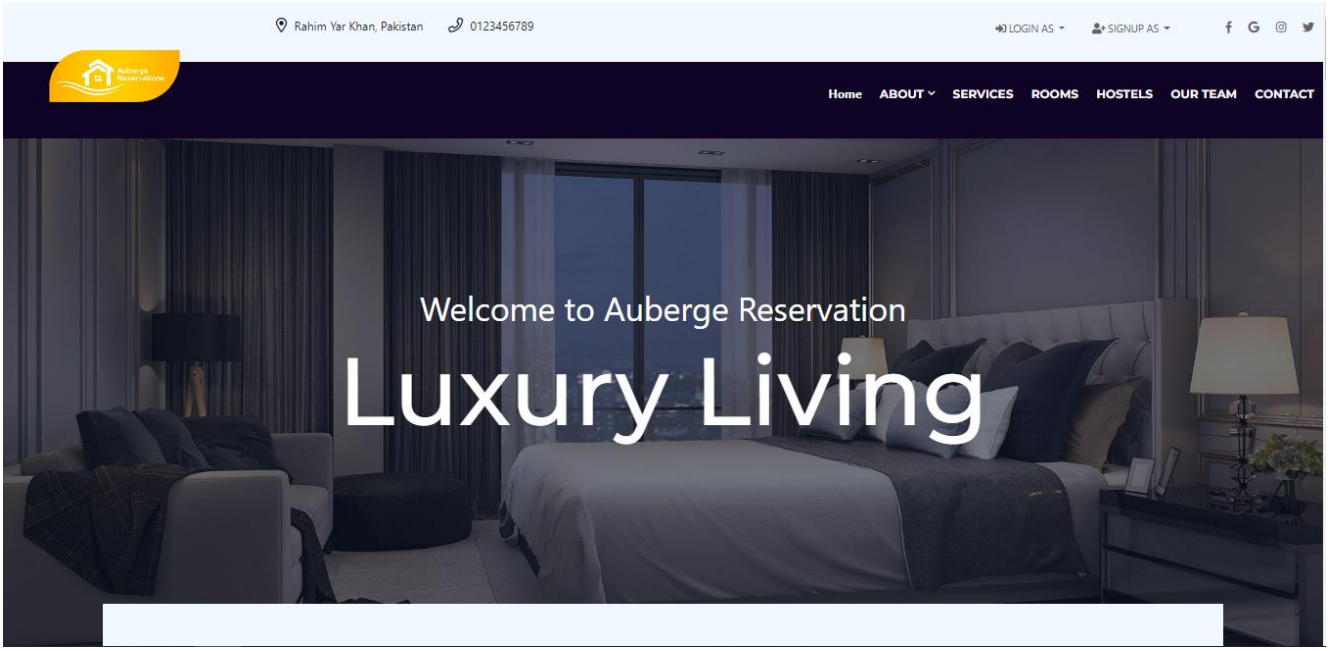

Fig. 8. Home page

Figure 9 shows the featured rooms' slide with the basic information and description about the featured rooms.

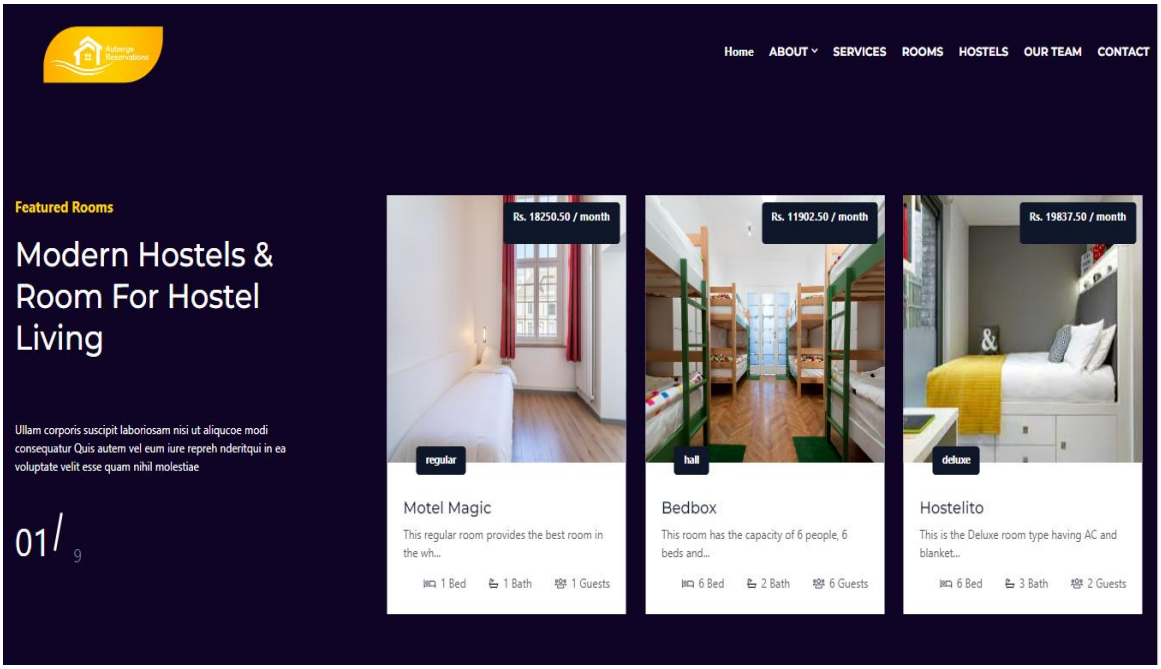

Fig. 9. Featured Room

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3.1.1 Login

Figure 10 shows the login panel for both the students and hostel owners. It requires an email address and password. If a user forgets his/her password, there is an option to reset the Password for password recovery. The Reset Password page will take the user to another page, as shown in Fig. 11, where the user needs to write the registered email address and proceed with password recovery. After confirmation via email, the user can reset the previous password to a new password.

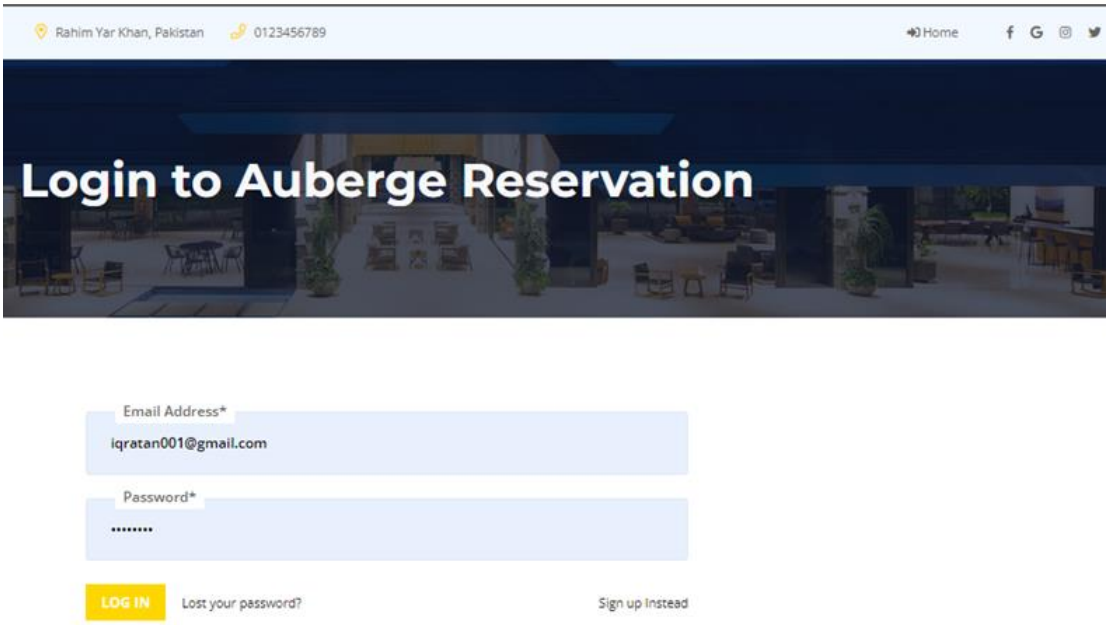

Fig. 10. Login page

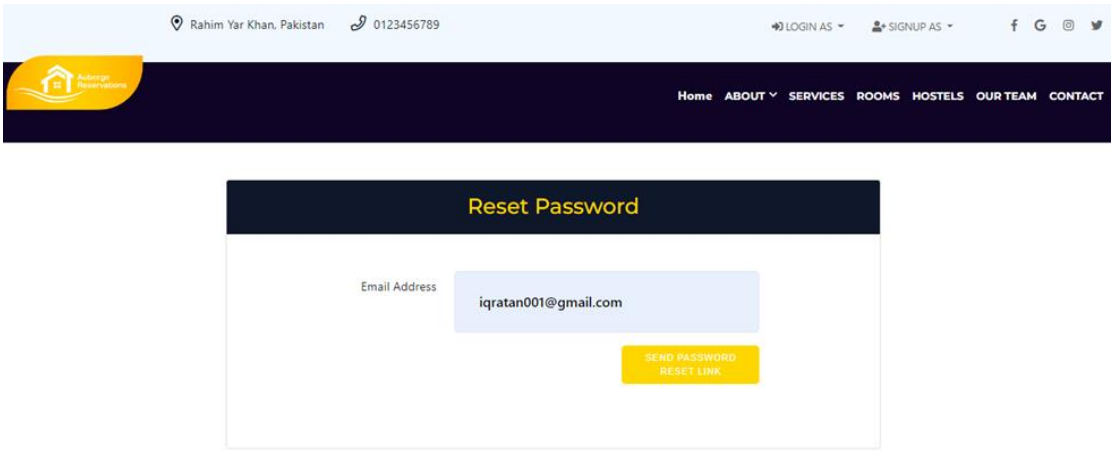

Fig. 11. Forgot Password page

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3.1.2 Student Sign-up

Students will need to sign up before using the website. The sign-up page requires the student's personal information, like his name, contact number, email address, and password, as shown in Fig. 12. After authenticating students' credentials, the admin could approve sign-up.

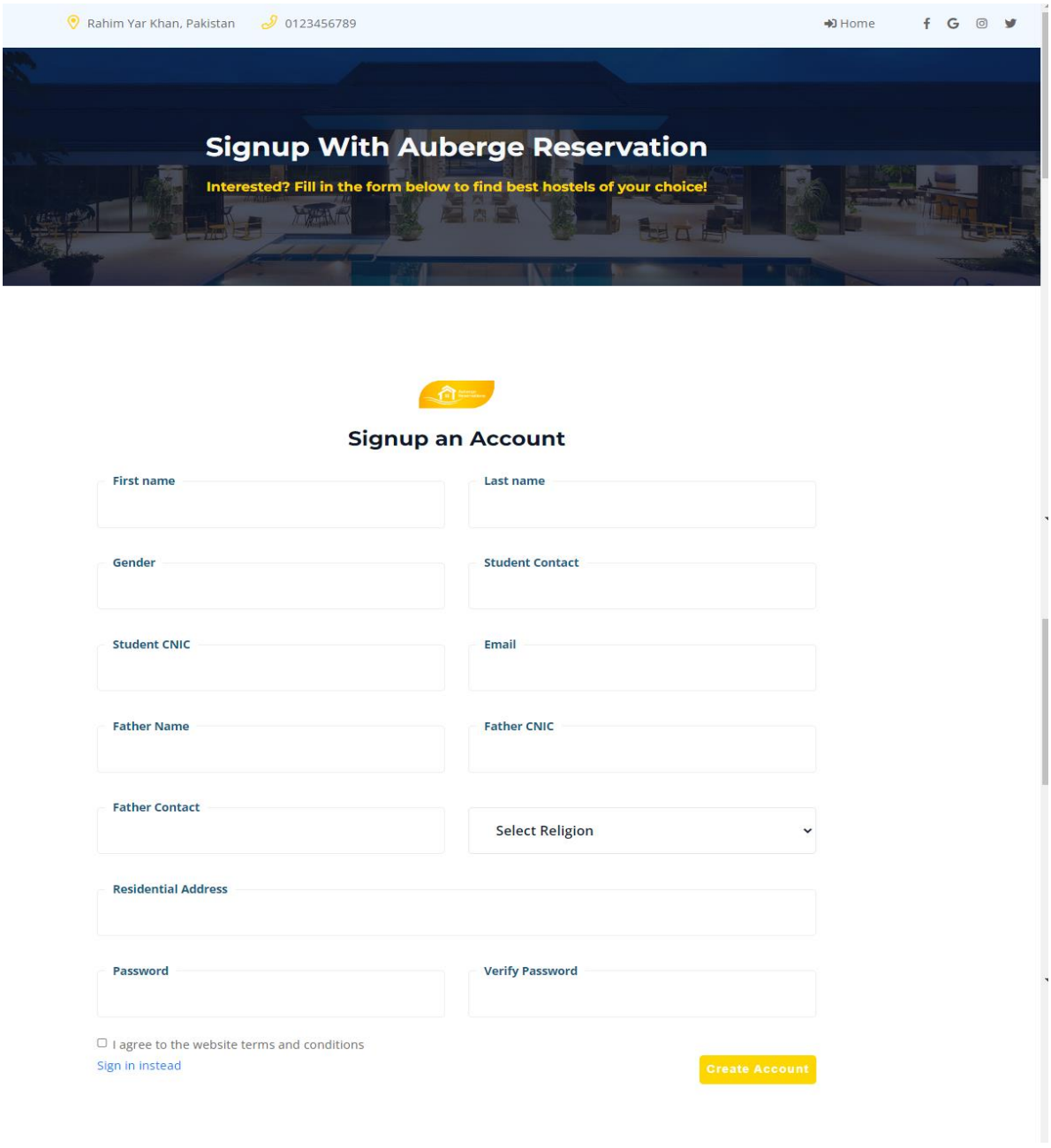

Fig. 12. Student Sign-up form

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3.1.3 Hostel administration sign-up

Those hostels willing to be part of Auberge Reservations would sign up via hostel administration sign-up by accurately providing all the necessary details about their hostels. These details include the hostel address, owner details, hostel name, facilities in hostels, room rent, number of rooms, etc. These details will be received by the admin and approved after confirmation. Fig. 13 shows the sign-up page for hostel administrators.

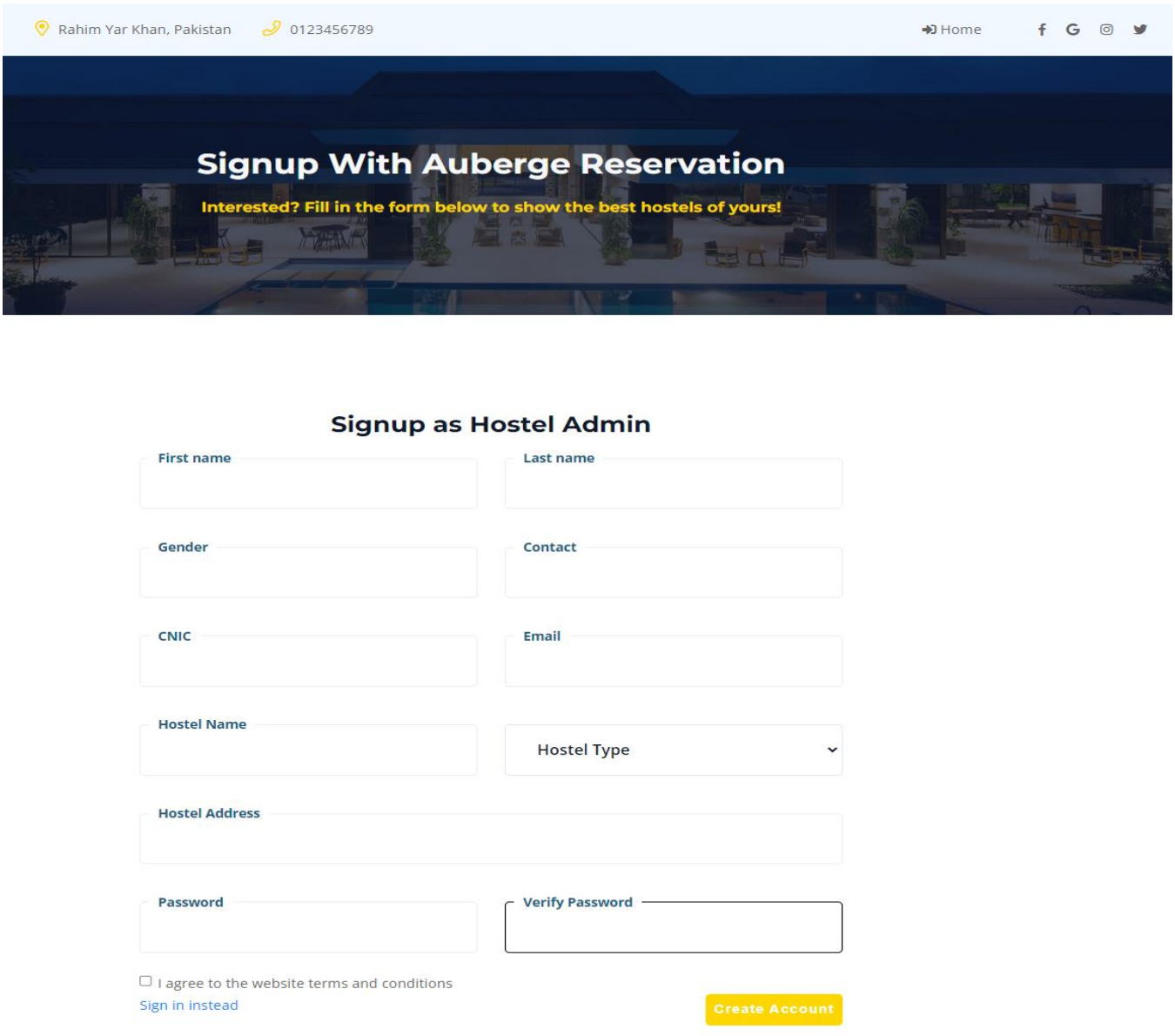

Fig. 13. Hostel admin sign-up form

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3.1.4 Room Search

The room search allows the students to search rooms according to their requirements, as shown in Fig. 14. They can go for a single, double, or shared room based on their budget by choosing from the budget menu. The students can also search for a room by selecting the monthly room rental options. There is also an option for searching both male and female rooms.

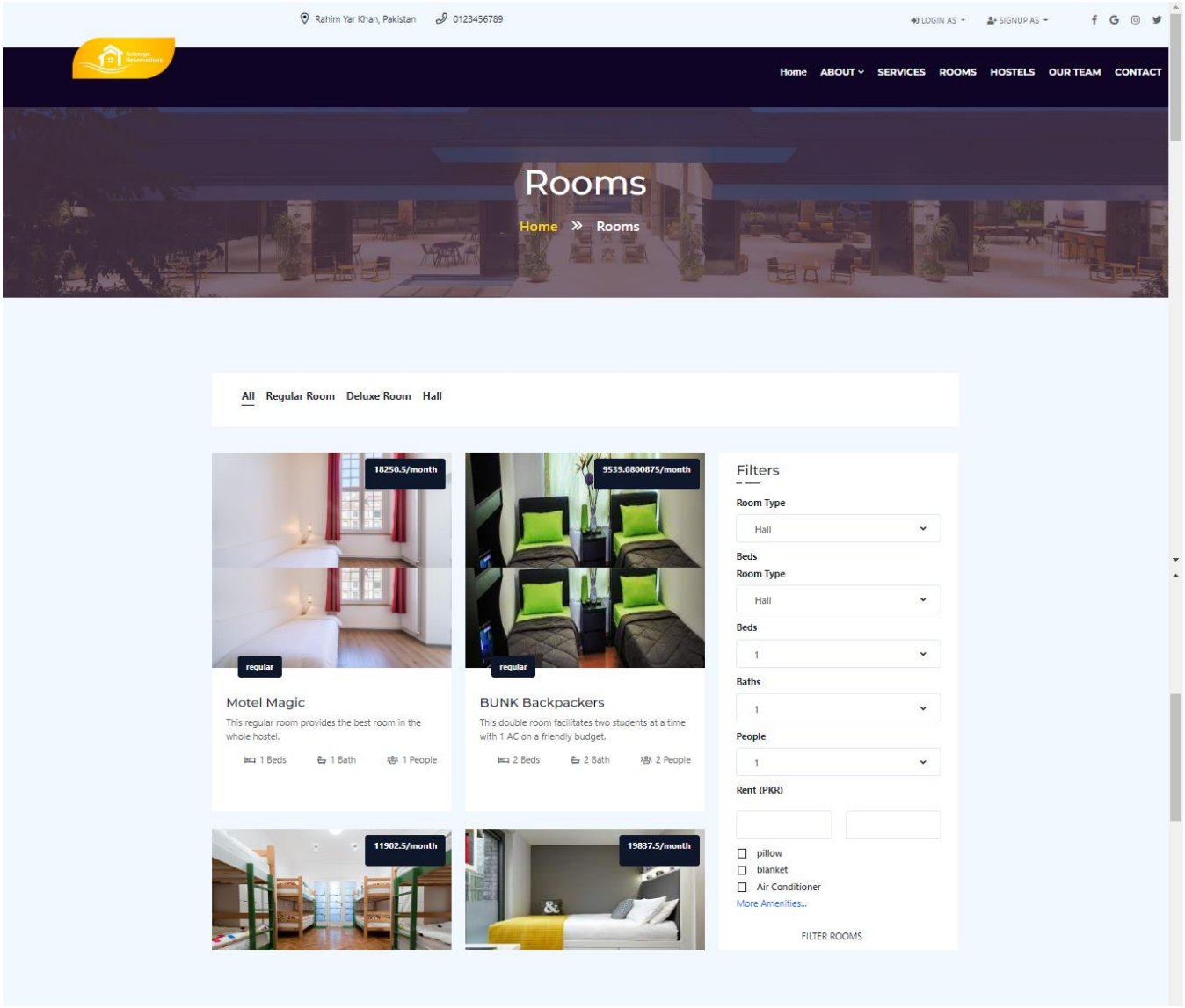

Figure 14: Room Filtration

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3.1.5 Payment

3.1.5.1 Booking by credit card

The payment method is also integrated into the Auberge Reservations website. There is an option of credit card payment and cash payment. When selecting the credit card payment option, credit card-related details need to be provided. The Stripe method is integrated into the payment transfer process. Fig. 15 shows the credit card module.

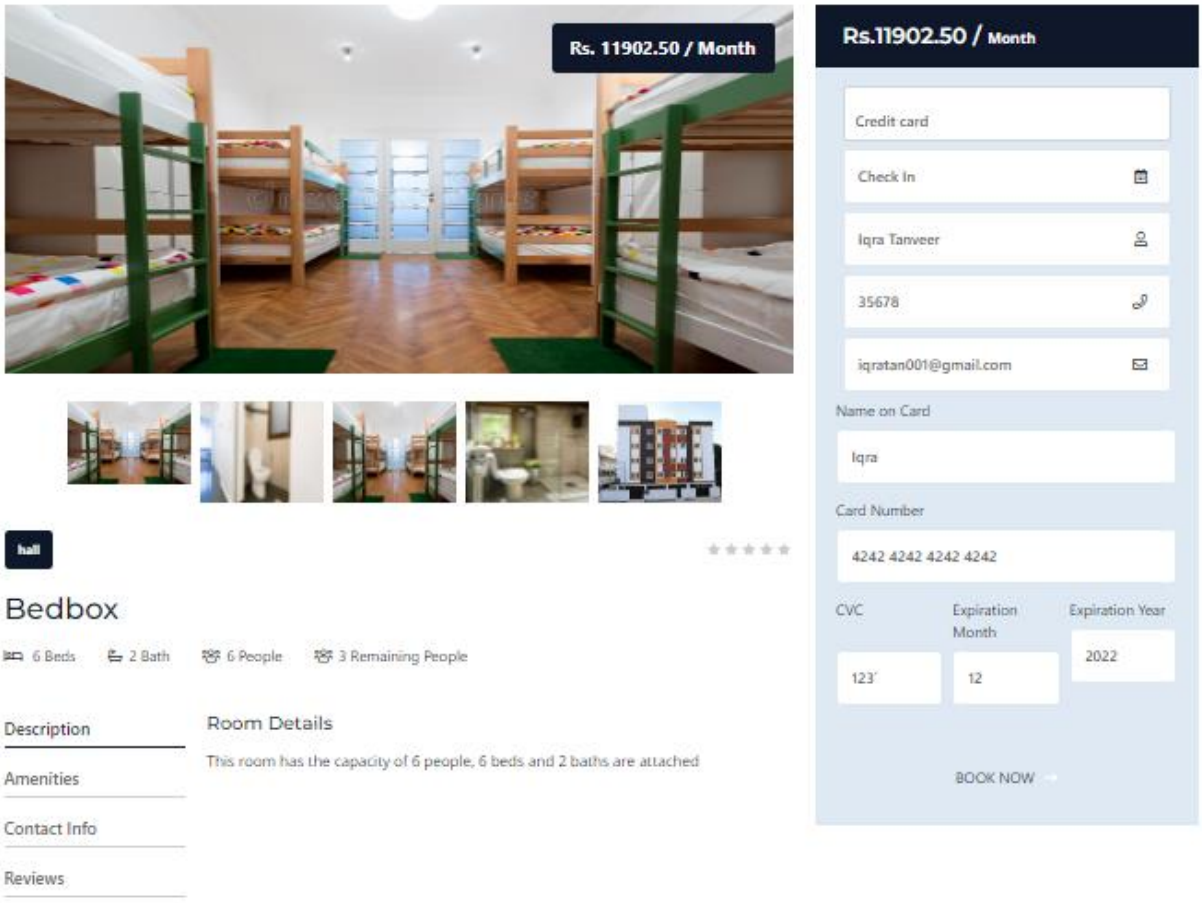

Figure 15: Room booking by credit/debit card

3.1.5.2 Booking by cash

Not everyone has a credit or debit card, so the cash payment module is also integrated into the website for maximum applicability. The “Booking by Cash” section hides some information box. It shows the student’s information for the cash payment method. Fig. 16 shows the cash on the delivery module.

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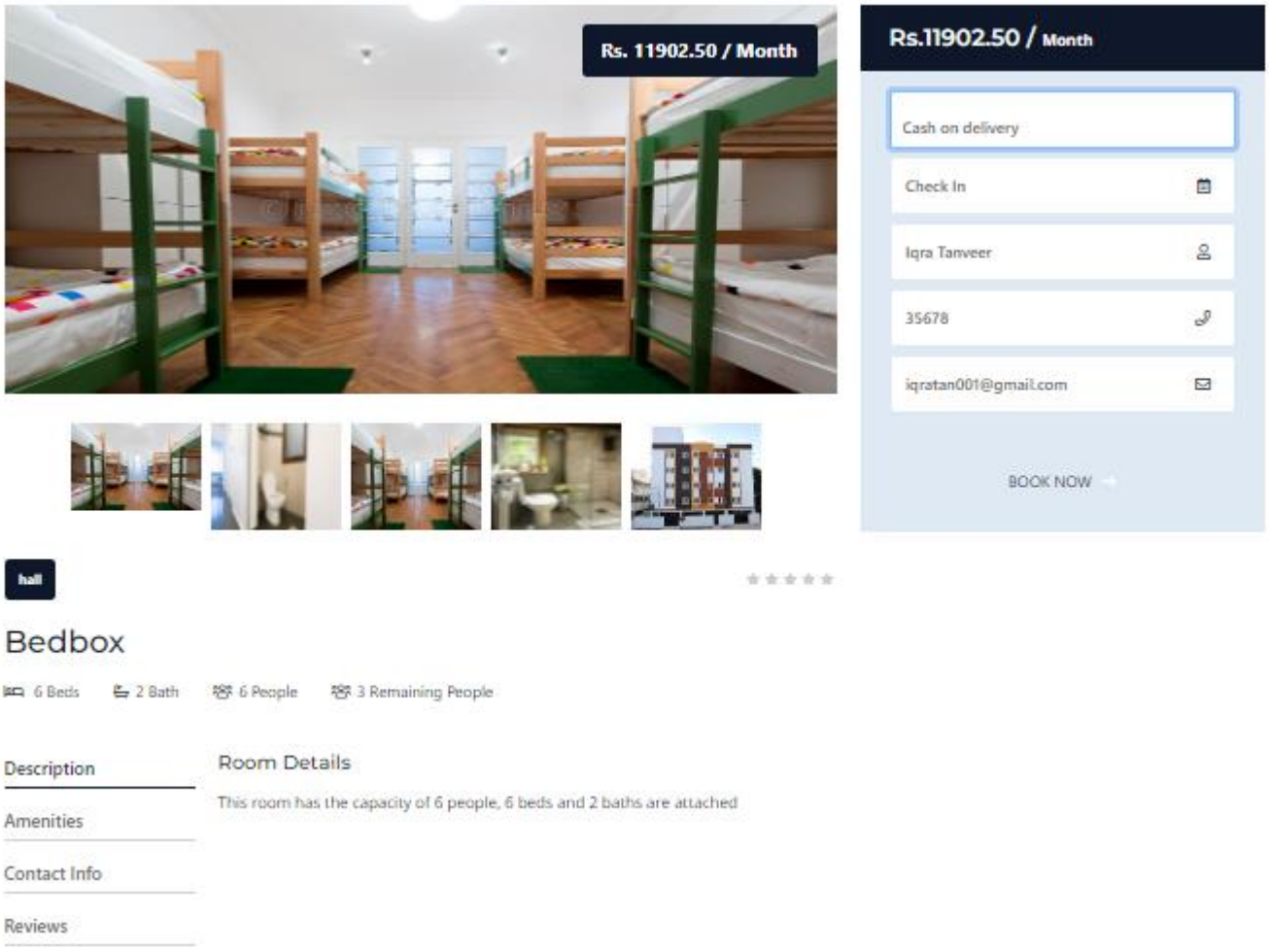

Fig. 16. Room booking by Cash

3.1.5.3 Booking Invoice

After the billing section is completed, an invoice can be generated and saved as a PDF file on a computer/mobile device. The data of the user is then stored in a database. The invoice module is shown in Fig. 17.

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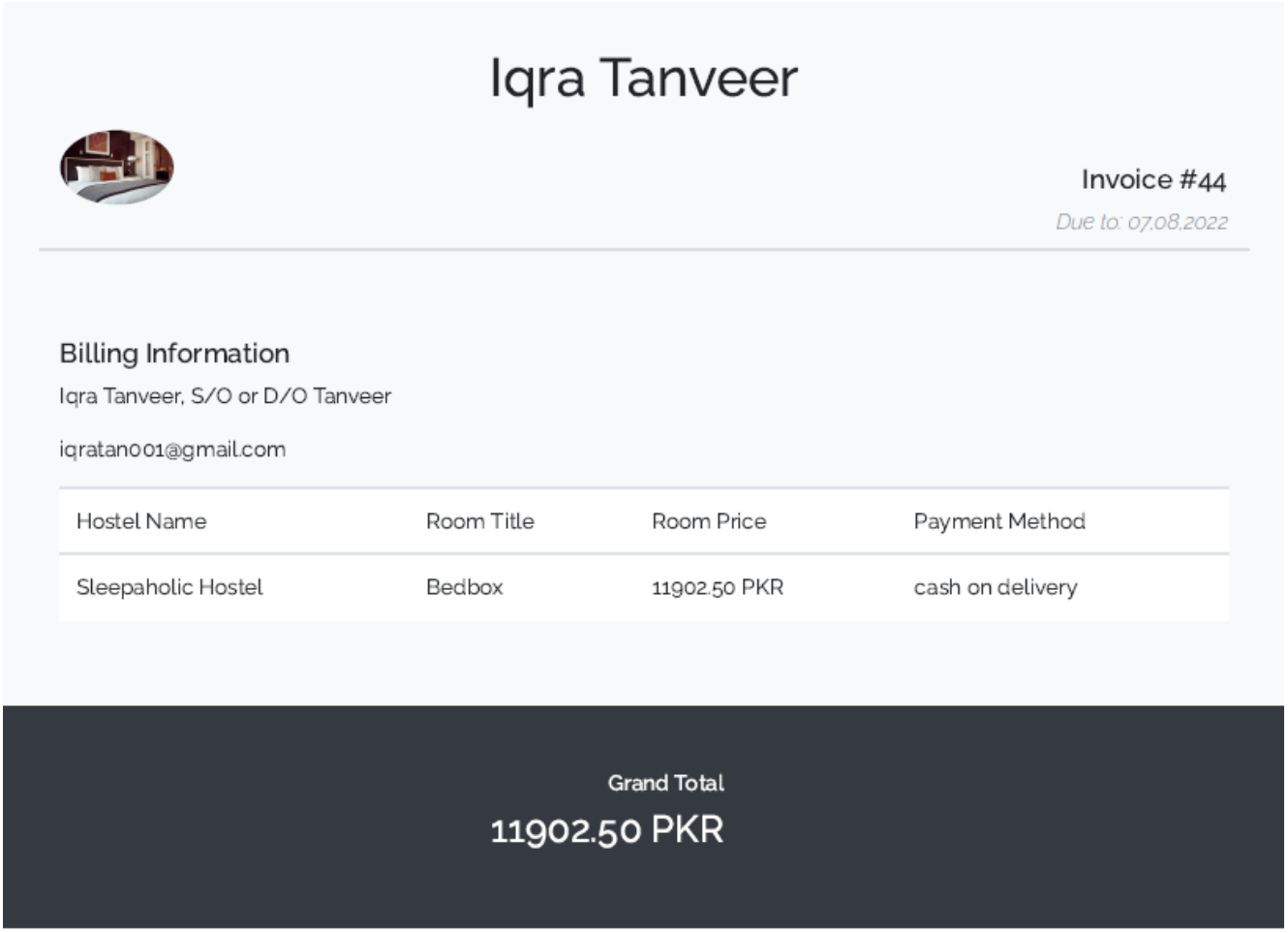

Fig. 17. Invoice

3.2 Super-Admin Dashboard

The Super Admin Panel is used by the owners of the website, using which they can add, delete, and edit the hostel's details, room details, and student details. The overall earnings and number of vendors and students who booked their hostels and rooms on the website can be seen by the super admin. The first view page of the Super-admin panel is shown in Fig. 18.

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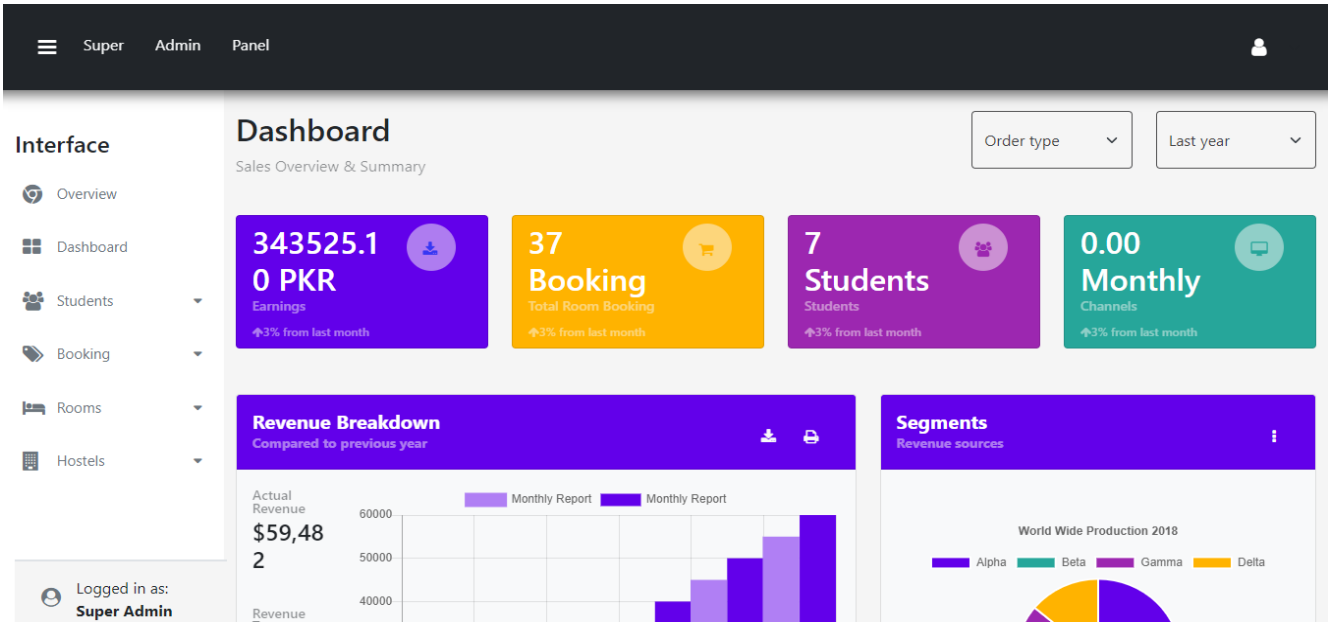

Fig. 18. Super-Admin dashboard

3.2.1 Student Details

The Super Admin may examine the information of all students on this webpage. Fig. 19 shows the displayed information on this page.

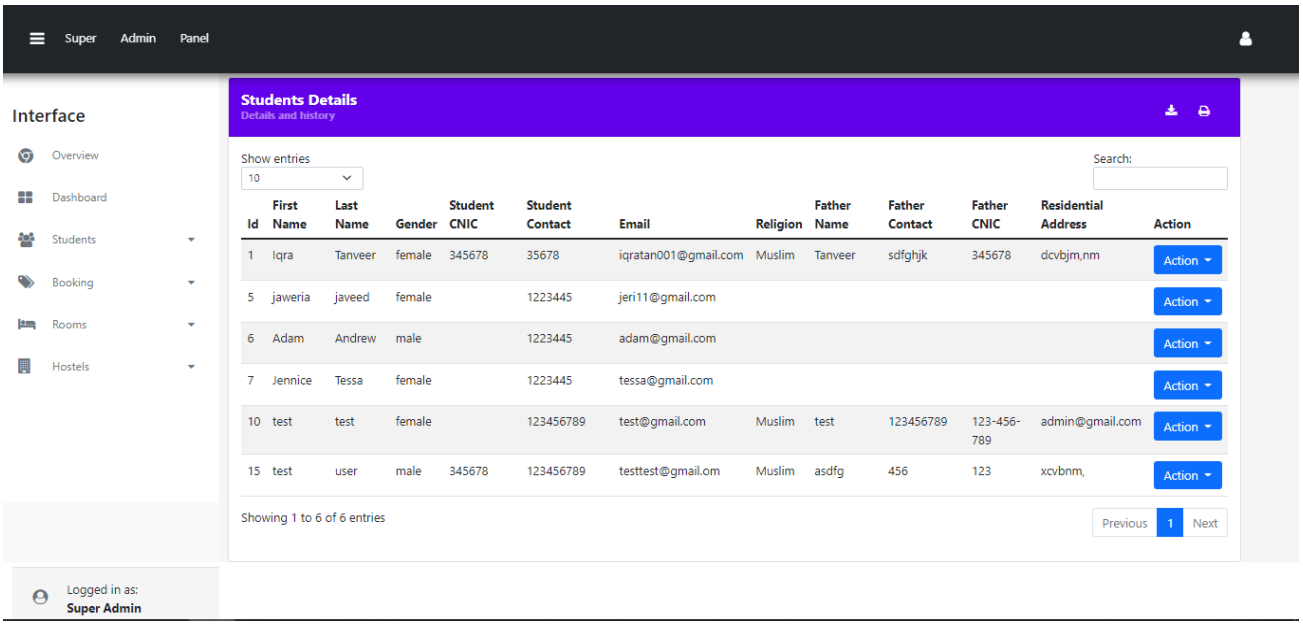

Fig. 19. Student detail in Super-Admin Panel

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3.2.2 Room Details

This module allows the administrator to examine all the rooms inside the database. The administrator can view the rooms by selecting the hostels and pressing on submit to let the program show the rooms' availability in a specific hostel. The administrator can update/change, or remove any spaces using this page. Fig. 20 shows the hostels and room details on the webpage.

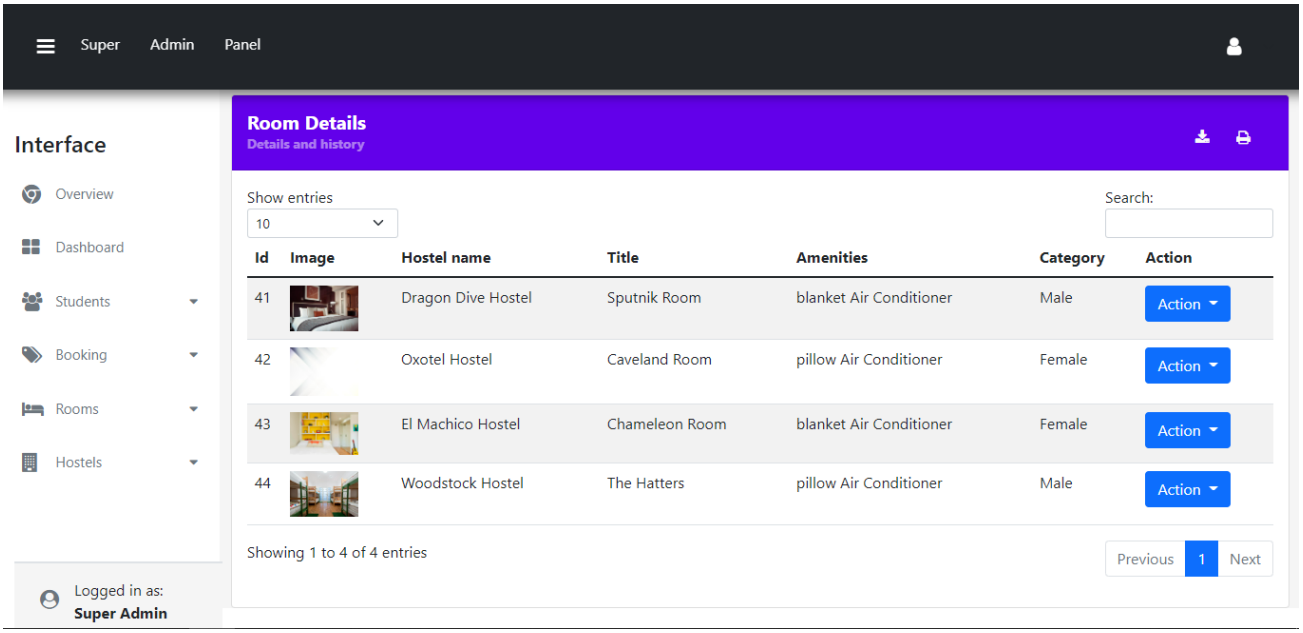

Fig. 20. Room detail in Super-Admin Panel

3.2.3 Hostel Details

This section allows the Super Admin to examine all the hostels inside the database—the Super Admin views the hostels and the amenities that the hostel provides. The administrator may update or remove any room using this window. The webpage to see hostel information is shown in Fig. 21.

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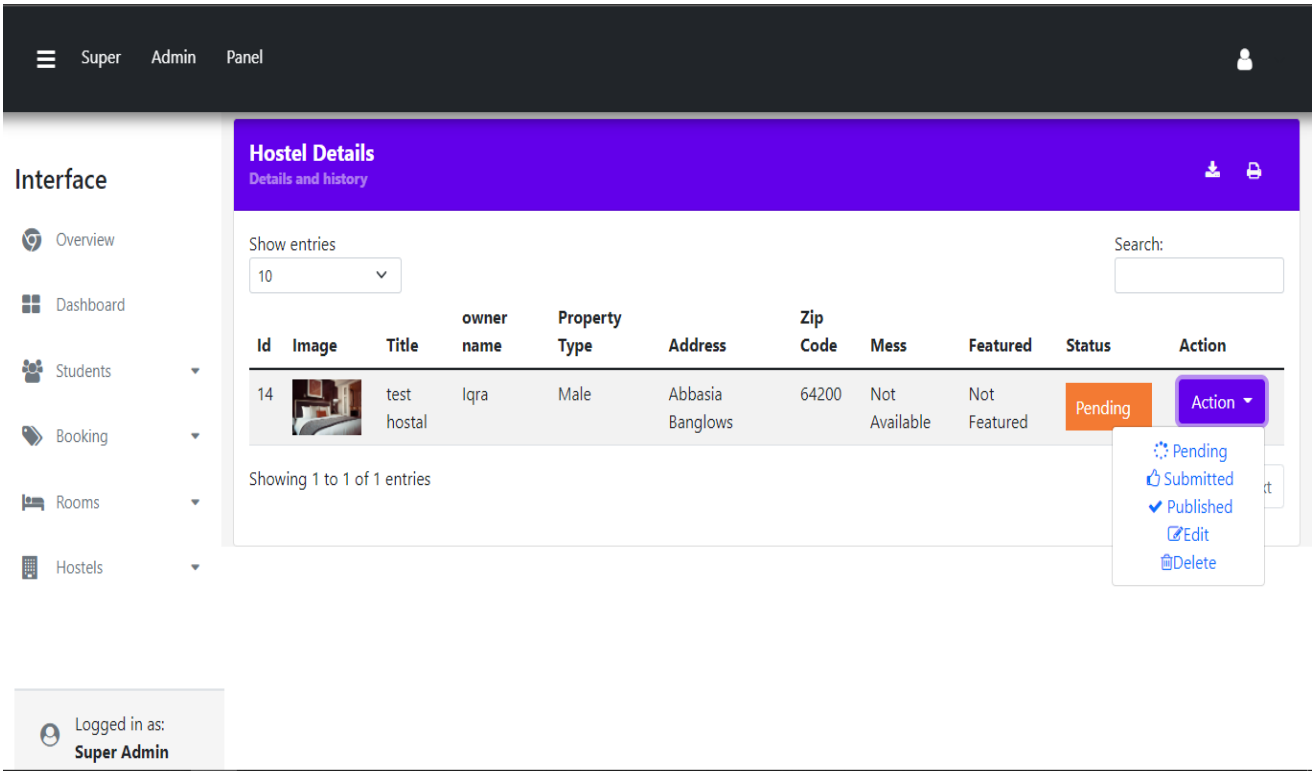

Fig. 21. Hostel detail in Super-Admin Panel

3.2.4 Hostel Admin Dashboard

The hostel admin panel is used by the owners of the hostel, using which the owners can add, delete, and edit room details, view the student details, and add, delete, or edit amenities. The overall earnings and number of students who booked their rooms in the hostel are shown on the panel dashboard. Fig 22 shows the Hostel Admin Profile page of the hostel admin panel, and Fig 23 shows the dashboard of the Hostel Admin Panel.

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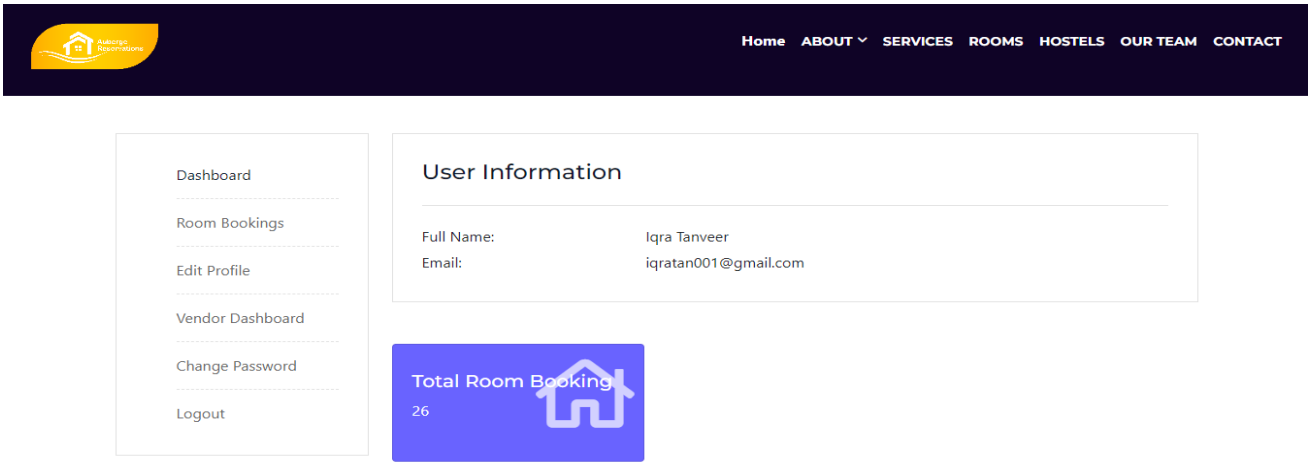

Fig. 22. Hostel Admin Profile

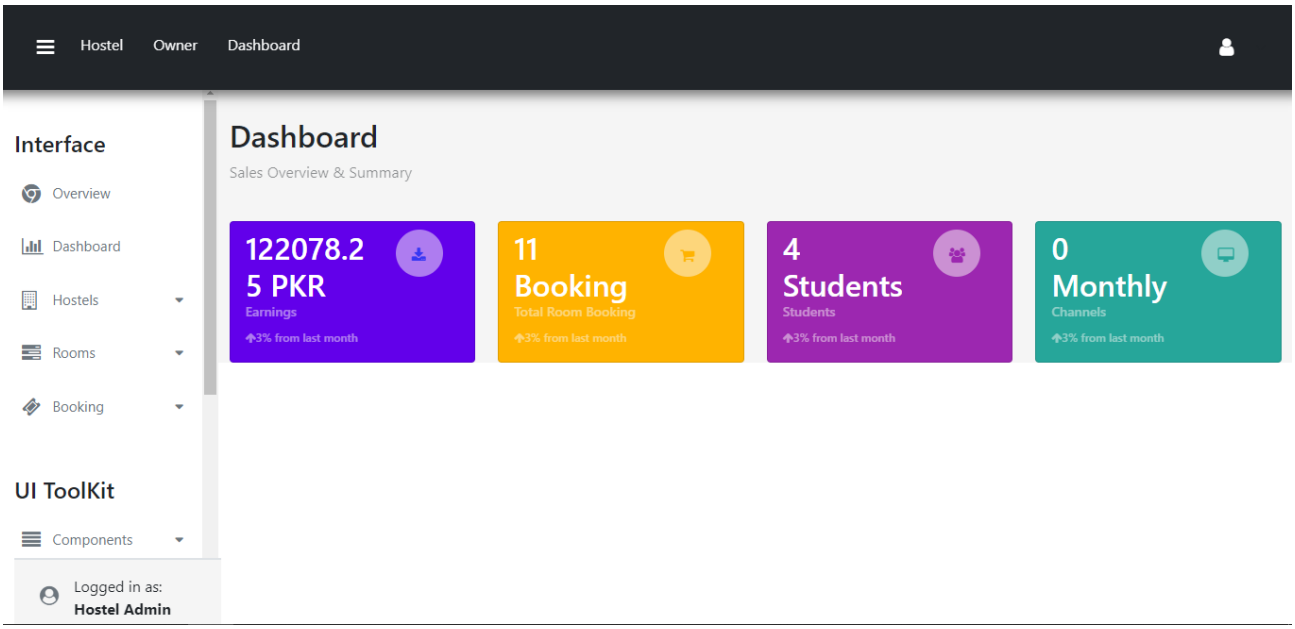

Fig. 23. Hostel Admin Dashboard

3.2.5 Hostel Admin Room Details

Similarly, the Super Admin and Hostel Owners can also see the room details they entered as depicted in Fig. 24. Hostel owners can add, remove, and edit room detail in this module.

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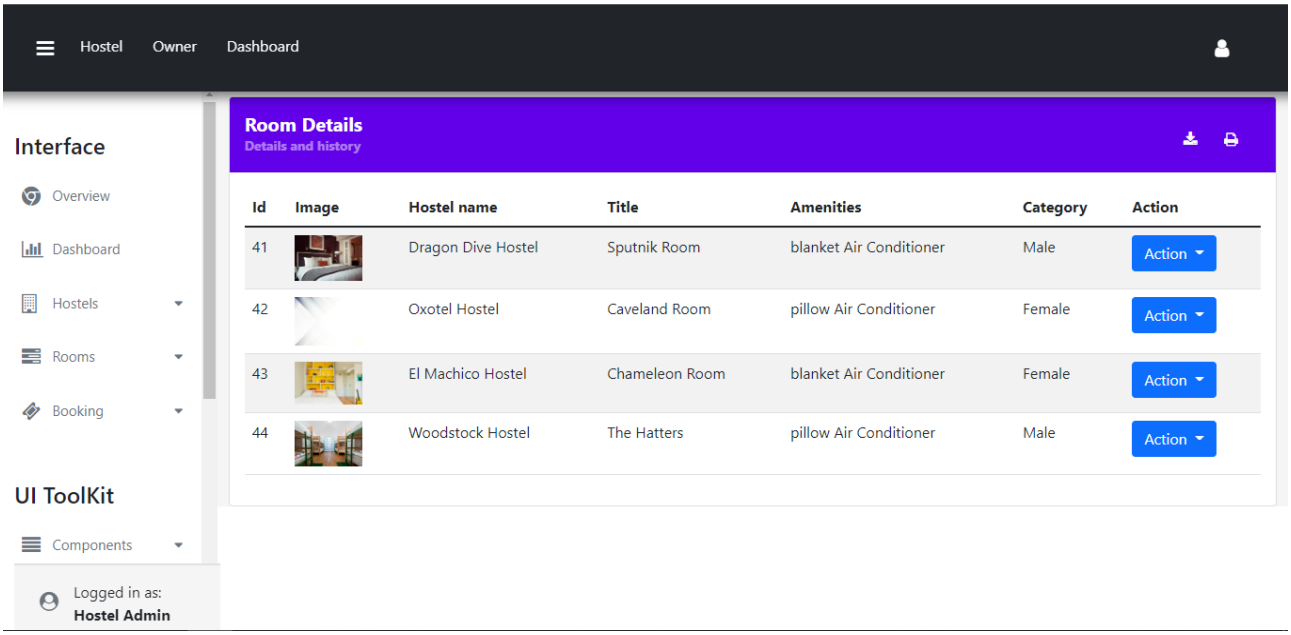

Fig. 24. Room detail in Hostel-Admin Panel

3.2.6 Hostel Admin Booking Detail

The booking Details module shows the details of students and their booking status. Booking status display pending and submitted action. The payment methods by which students pay their fees are also shown in this module. Fig. 25 shows the booking detail module.

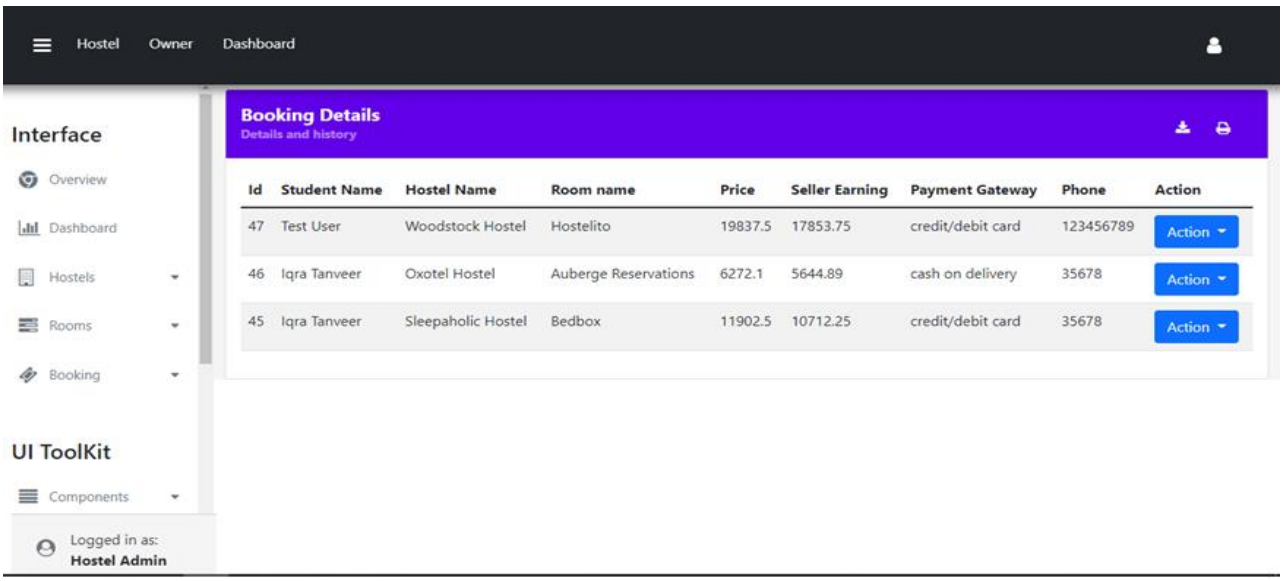

Fig. 25. Booking detail in Hostel Admin Panel

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3.3 Comparison Table

The complex and lengthy software development process necessitates technical expertise and project management skills. Adopting the right strategy before beginning a new development is crucial as it decides the project's success or failure in the future. Table 2 shows a comparison of the developed and reported websites for online hostel reservations. The websites are compared based on the developed model, model complexity, languages used to develop the project, location identification system integration, customer feedback, and some other strengths and weaknesses.

Table 2. Comparison Table

References	(Sofiya, 2018)	(Sudarsono, 2020)
Work Deficiency	Incorporate a system that notifies them through email or text when the reservation has been authorized or canceled.	The location identification system is missing. Based on the hotel reservation system
Customer feedback	No Feedback	Yes
Location identification	No	No
Development languages	PHP and Xampp	Extreme Programming
Methodology	Iterative methodology	OOP Methodology
Model Complexity	easy to accommodate	Easy to accommodate
Development Model	Iterative model	Waterfall model
Website description	Online scheduling is available for students. When there is a conflict, priority scheduling may choose who receives the slot according to various factors. As a solution, this project proposes using an iterative development approach.	Extreme Programming is a method of modelling used in the agile development process. The system developed in this research is an Extreme Programming–based hotel reservation system; its OO foundation necessitates the CRC approach, and its design is partitioned into classes.

(Ashesh & AppaRao, 2020)	(Emmanuel, 2015)	(Aysha & Husna, 2022)	(Choudhury et al., 2017b)
The project development model and Payment method are not defined.	Online payment of rent is not integrated Not deal with hostel issues like Mess and Amenities	Numerous issues, including a lack of resources, time, and knowledge, have arisen due to this research.	The project development model and Payment method are not defined.
Yes	No Feedback	No Feedback	No feedback
No	No	No	No
HTML, JavaScript	HTML, CSS, JS, PHP, MySQL	C++, MySQL	JavaScript SQL, SS
Not Defined	OOP Methodology	Not Defined	Not Defined
Not Defined	Not Defined	Not Defined	Not defined
Not Defined	Not Defined	Not Defined	Not Defined
A student may sign up for a hostel, reserve a room for their stay, and find out about upcoming activities and other relevant information in a convenient place by using a hostel management site. Using this site, students may give comments online.	A hostel management system was designed by the College of Agriculture in Lafia. With its extensive database, it keeps any data about hostels. Due to the nature of databases, this also makes it possible to update this kind of data. Students may apply for dorm rooms online as well.	The primary goal of this study is to develop a web-based tool to facilitate student spending on hostel preview stays. This study aims to develop a web-based platform for allocating dorm rooms at youth hostels. Therefore, having such digital tools available will facilitate precise record-keeping.	This project deals with the problems of managing a hostel and avoids the problems that occur manually.

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(Isinkaye et al., 2022)	Distance, Price, Amenities, Apartment, Pay type, Water and Security	Yes	Yes	PHP, CSS, My SQL Database	Only Defined Tool	Not defined	Not Defined
This Work	Applicable in one city only.	Yes	Yes	HTML, CSS, Bootstrap 4, JS, JQuery, PHP(Laravel), MySQL	OOP Methodology	Moderate	Waterfall Model

This project is based on a location identification system that enhances recommendation abilities.	Auberge Reservations is a web application especially meant to be used by hostel owners and students of a particular city. The map and payment method are also integrated into the web application for the location identification system of the hostel. Students' feedback form is also available on this site.

4. Conclusion and Future Work

4.1 Conclusion

The proposed application "Auberge Reservations" for the hostel reservation and location identification system is based on the requirements that are gathered from the users and by analyzing the current situation of existing systems. Recognizing existing systems' drawbacks helped us develop the idea of Auberge Reservations. This website is more user-friendly and effective.

Initially, the web application was offered to the students and hostel owners in Rahim Yar Khan city with multiple benefits over the traditional reservation websites. This project provides hostel management and reservation with accurate location identification for a large number of users.

The developed system ensures the following:

- Hostel reservation requests are sent through the internet.
- After paying the hostel fees via the provided payment methods (credit card or cash payment), the hostel room is allotted through the internet.
- The risk of human errors is decreased.
- Students will become familiar with more hostels in town.
- The hostel admin will be able to use the system without difficulty.

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4.2 Achievements of the Proposed System

The hostel reservation and location identification system has been tested and has the following achievements:

- Online hostel reservation system
- Online hostel location identification system
- Allotment of rooms according to user requirements
- Payment via online services

4.3 Areas of Application

The Auberge Reservations can be used in any city to facilitate the students and hostel owners. The students of any institution can apply for room allotment in the nearest hostels using this website.

4.4 Contribution

After a thorough literature review, deficiencies in the existing hostel reservation software have been noticed, and the proposed Auberge Reservations website has been implemented to overcome those challenges. Previous work was just a hostel system that could only be implemented in a hostel to facilitate managing staff. The payment method was also missing in the previous work. The main idea we cover is to provide a fully dynamic and developed web application to facilitate both students and hostel owners. Two payment methods are implemented in Auberge Reservations: Cash and credit card payments. The map is also integrated into the web application for the location identification system of the hostel.

4.5 Suggestions for Future Work

We are working on the website to add more functionalities and to extend our database to other cities so that students from all over the country may select their nearest favorite hostel on the internet. The hostel owners will also be able to advertise their hostels.

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