Hostel Management System

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Abstract: **"Online Hostel Management System" is software developed for managing various activities in the hostel. For the past few years the number of educational institutions is increasing rapidly. Thereby the number of hostels is also increasing for the accommodation of the students studying in this institution. And hence there is a lot of strain on the person who are running the hostel and software's are not usually used in this context. This particular project deals with the problems on managing a hostel and avoids the problems which occur when carried manually. Identification of the drawbacks of the existing system leads to the designing of computerized system that will be compatible to the existing system with the system which is more user friendly and more website oriented. We can improve the efficiency of the system, thus overcome the drawbacks of the existing system.**

Keywords: **Online Hostel Management, Web Application, Database Management.**

1. 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. . 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

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 hostelers 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

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

The Hostel management system will be developed by us students we will be using frameworks, databases, and many practices to complete our project. To start with a base we will be using java ,xml, MySQL , which is the basic to create GUI.

MySQL: MySQL is open-source database management system. It has a relational database.

Java : java is a platform independent and object oriented programming language. It is invented to achieve program independency for developing internet based business application.java support to develop both standalone and internet application.

Xml : xml stands for extensible markup language it is basically used in android studio to develop the interface of application.

2. RELATED WORK

2.1 Traditional Hostel Management Systems

In the beginning, most hostel management systems were made for desktop computers. These programs could do only basic tasks like assigning rooms to students and keeping track of who had paid their fees (Patil et al., 2016). But they weren't very advanced. They didn't support multiple users at the same time, and there was no way to get real-time updates. Also, they were hard to move from one system to another, difficult to maintain, and not very user-friendly.

2.2 Web-based Solutions

Later on, web-based hostel management systems became more common. These allowed students and hostel staff to use online tools for booking rooms, paying fees, and submitting complaints (Sharma & Mehta, 2018). These systems were more accessible than desktop software, but they had their own problems. They didn't work well without internet access, and sometimes the website didn't display properly on mobile phones or smaller screens, which made using them frustrating.

2.3 Mobile-based Systems and Android Applications

Nowadays, Android phones are everywhere (Statista, 2023), so it makes sense that developers have started making hostel management apps for Android. Using Android Studio, developers can build mobile apps that are easy to use, send instant notifications, and provide a better experience for students and hostel managers.

According to Ahmed et al. (2019), mobile apps are more accessible and keep users more engaged. One study by Roy et al. (2020) even created a hostel management app using Android Studio. Their app included features like student login, booking rooms, registering complaints, and tracking payments. The result? The hostel's work became faster, more efficient, and a lot of the old paperwork was no longer needed.

3. OBJECTIVE

- **Simplify Room Allocation**

The app will help in automatically giving rooms to students based on what's available and what they prefer. This removes the need to do it manually and reduces chances of mistakes.

- **Improve Record Management**

All information about students, rooms, payments, and complaints will be stored digitally. This makes it easier to find, update, and manage data without using paper files.

- **Enhance Communication**

The app will let students and hostel staff send messages or updates instantly. For example, students can file complaints, and staff can reply through the app.

- **Enable Online Fee Tracking**

Students can check if their hostel fees are paid or due using the app. Hostel staff can also keep track of who has paid and who hasn't, all in one place.

- **Increase Accessibility**

Because it's a mobile app, students and admins can use it anytime and from anywhere. They don't need to go to the office or log in from a computer.

- **Reduce Paperwork**

Since everything is done in the app—like records, payments, and complaints—there's no need to use paper forms, which saves time and is better for the environment.

- **Provide a Secure and Role-Based Login System**

The app will have different login options for students and admin staff. This way, everyone sees only what they're allowed to see, and all data stays safe.

3.1 Literature Review

In the past, hostel management was mostly done using paper records or computer programs that only worked on desktops. But now, with smartphones being so common, using mobile apps—especially on Android—makes it much easier and more efficient to handle things like assigning rooms, keeping track of students, managing fees, handling complaints, and sending out important notices. Android Studio, which is the main software used to create Android apps, has all the tools needed to build and manage these kinds of applications.

Right now, many hostel management systems are either desktop-based or web-based. Manual systems still use paper and notebooks, which can easily get lost, have repeated data, and are generally inefficient. Desktop applications are better, but they can only be used on one computer and don't allow updates in real time. Web-based systems let people access the hostel data online, but they usually need a strong internet connection and can be harder to use compared to mobile apps. Overall, most of these systems lack features like mobile access, instant alerts, and modern, easy-to-use interfaces. This makes them less effective, especially in hostels where things change often.

Even though hostel management apps for Android are becoming more common, most of them still don't include all the important features like tracking fees, checking room availability, managing attendance, and offering real-time help. Also, not much research has been done to see how well these apps actually work or how easy they are to use in real schools or colleges.

In 2019, Kumar and his team created a hostel management system using PHP and MySQL. It could handle room assignments and track fees, but it didn't work on mobile devices. A year later, Ramesh and Gupta introduced a web-based system that focused on handling complaints and getting feedback, but they pointed out that mobile access was still missing. In 2021, Ali and Fatima developed a mobile app for hostel management using Android and Firebase. Their app included login, room booking, and complaint features, and they found that users were more satisfied because of the convenience of using it on their phones. There are also free tools like "HostelApp" on GitHub, which offer basic features like login and complaint submission. However, these apps usually don't scale well and may not have strong security.
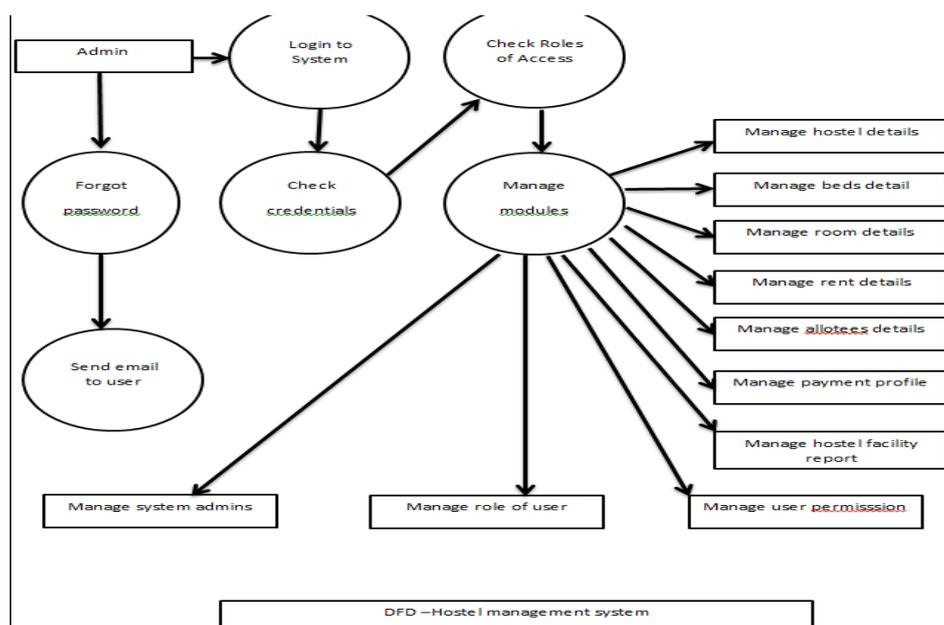

Fig 1: DFD diagram

4. OVERALL READINESS

- **Core Features Implemented**

All major modules such as student registration, room allocation, complaint submission, fee tracking, and admin dashboard are fully developed and functional.

- **User Interface (UI) Tested**

The app has a clean and intuitive design that has been tested for ease of use, ensuring users can navigate through features without confusion.

- **Database Connectivity**

The system is integrated with a local database (e.g., SQLite) or cloud-based services (e.g., Firebase) to store and retrieve data efficiently.

- **Login and Security**

Role-based login features for both students and admins are implemented to protect sensitive information and ensure secure access.

- **Bug Testing and Stability**

The application has undergone basic functional testing to fix common bugs and ensure it runs reliably on supported Android versions.

- **Offline and Online Support**

Basic features work offline, with options for online synchronization when the internet is available, ensuring better usability.

- **Scalability and Future Scope**

The current version is ready for use in small to mid-sized institutions. It also has the potential to scale with additional features like online payments, biometric access, and analytics dashboards in future versions.
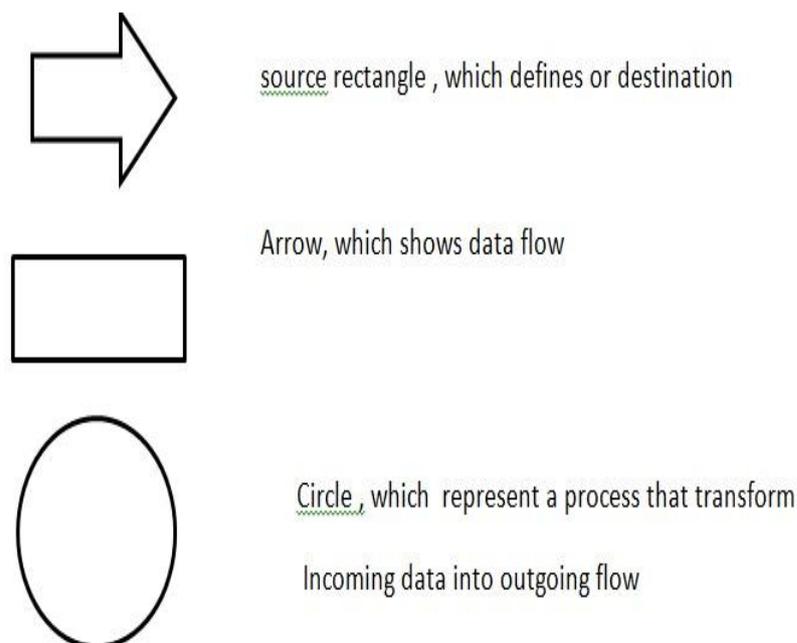

source rectangle , which defines or destination

Arrow, which shows data flow

Circle , which represent a process that transform

Incoming data into outgoing flow

Fig .2 Symbols used in data flow diagram.

5. RESULTS AND ANALYSIS

o **1. Results**

o After finishing the development and testing of the Hostel Management System in Android Studio, these are the main things that worked well:

o **Features Working Properly:**

All the main parts of the app like student signup, room booking, fee details, complaints, and admin login are working just as planned.

o **Easy-to-Use Interface:**

The app looks neat and is simple to use. People could move between screens and use features without getting confused.

o **Data Saving and Loading:**

The app saves and brings back data correctly using the database (like Firebase or SQLite). During testing, no data was lost, and there were no crashes.

o **Safe Login System:**

The login system worked well. Students and admins could log in separately and only see what they are supposed to. This keeps the app secure.

o **Notification Feature:**

If notifications (like updates on complaints or room status) were turned on using Firebase, they worked perfectly and helped improve communication.

o **App Stability:**

The app worked smoothly without crashing, even when used on different phones and with different internet connections.

o **2. Analysis**

o Based on the results and feedback from people who tested the app, here's what I found:

o **Time-Saving and Efficient:**

The app made daily hostel tasks faster. Things like room assignments, tracking complaints, and checking records took less time than doing them manually.

o **Positive Feedback from Users:**

Both students and hostel staff liked using the app. They said it was better than filling out forms or going to the office for every small task.

o **Fewer Mistakes:**

Since the app does many things automatically, there were fewer errors in assigning rooms or checking fee details.

6. ADVANTAGES AND DISADVANTAGES

Advantages:

User-Friendly Interface

The app is very simple to use. Even people who are not good with technology, like some students or hostel staff, can easily understand how to use it.

Real-Time Access

Students and hostel admins can use the app anytime and from anywhere using their Android phones. They don't need to go to the office for every small thing.

Time-Saving

The app makes things like giving rooms, checking fees, or handling complaints much quicker than doing them on paper or in person.

Better Record Management

All the information is saved digitally, so it's easy to find, update, or manage records without going through piles of files.

Secure Login System

There are separate logins for students and admins. This way, everyone only sees what they are allowed to, and the data stays protected.

Reduces Paperwork

Since everything is done in the app, there's no need to fill out paper forms or keep physical files. It also helps save paper.

Improved Communication

The app can send instant notifications or messages. For example, students can get updates about room changes or complaint replies right away.

Offline Support (Optional)

Some parts of the app can still work without internet, which is useful for people who don't always have a stable connection

Disadvantages:

User-Friendly Interface

The app is simple and easy to understand. Even if someone isn't great with technology, like some students or staff members, they can still use it without any trouble.

Real-Time Access

Students and hostel staff don't have to be in the hostel office to do things. They can use the app from anywhere and at any time, just using their phones.

Time-Saving

Work that used to take a lot of time—like assigning rooms, checking who paid fees, or dealing with complaints—can now be done in just a few clicks.

Better Record Management

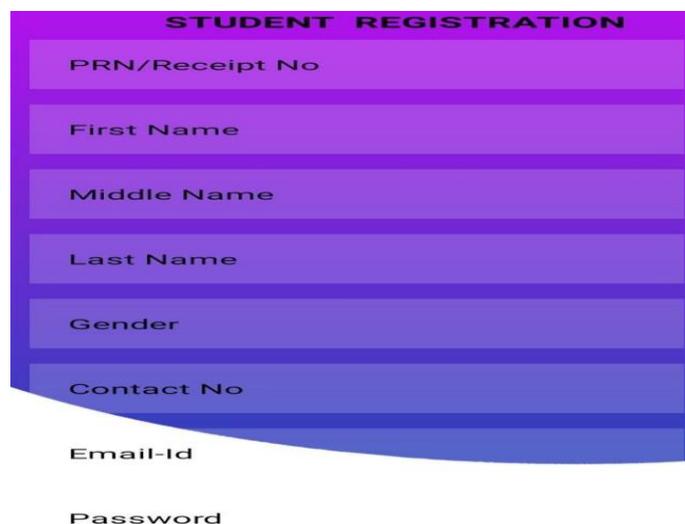Instead of writing everything in registers or keeping paper files, all the data is stored neatly in the app. It's easy to update and find any information when needed.
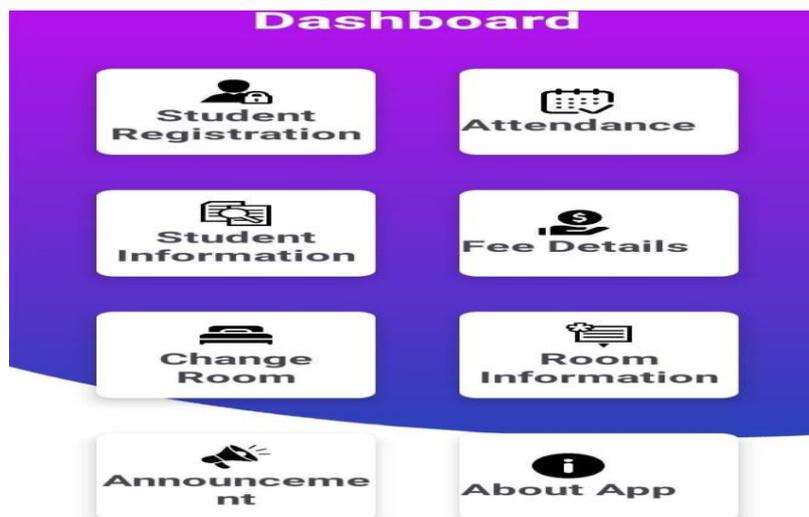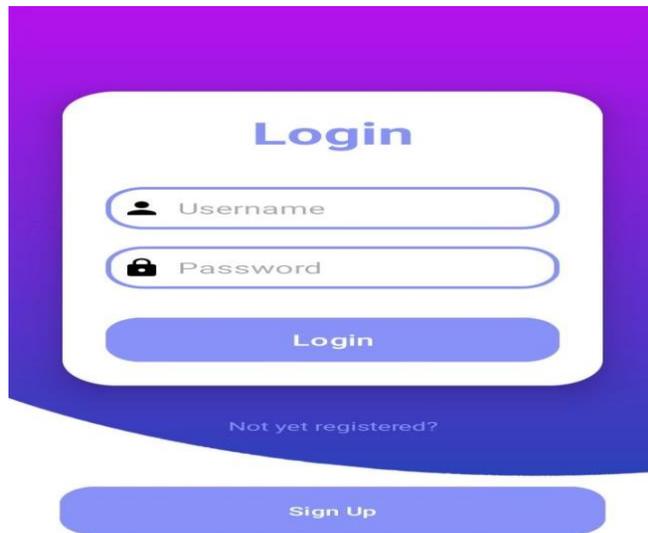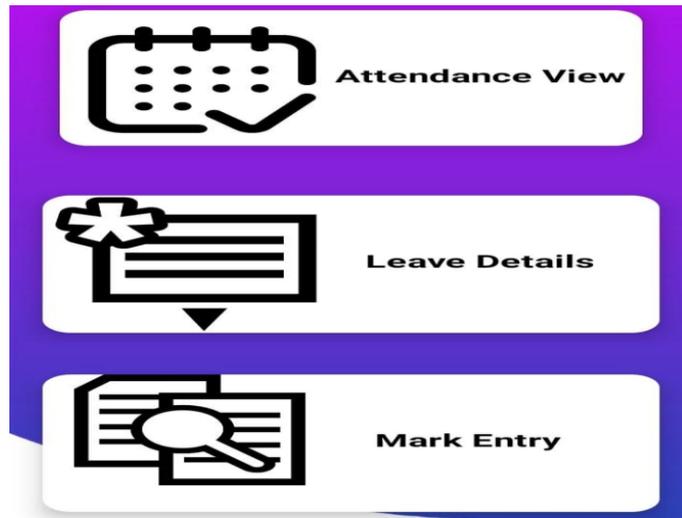
Secure Login System

There are different logins for students and admins. This means people only see what they need to, and personal or official data stays safe.

Reduces Paperwork

Since everything is handled inside the app, there's no need for printing forms or keeping files. It helps save time and is also better for the environment.

7. FINAL OUTCOME

Paper Publications

8. APPLICATION

1. College and University Hostels

This app can be really useful for colleges and universities. Hostel staff and students can use it to book rooms, pay hostel fees, and raise complaints—all from their phones.

2. School Boarding Houses

In boarding schools, this system can help keep track of which student is staying in which room, maintain records, and manage hostel-related problems easily.

3. Private or Rented Hostels

This app is also helpful for private hostels or PGs. The owners can use it to manage who is staying, collect monthly rent, and maintain a digital list of tenants.

4. Staff or Worker Hostels

Companies that provide hostel accommodation to their workers or staff can use this app to assign rooms, monitor who is staying, and handle any room or maintenance issues.

5. Government Hostel Schemes

Government hostels (like those for SC/ST students or tribal hostels) can use this system to make everything digital—from student applications to room allotments and expense tracking.

6. Hostel Fee Management

Admins can use the app to track who has paid their hostel fees, send reminders to those who haven't, and manage records without writing anything down or using paper.

7. Digital Complaint Handling

Students can use the app to report any problems they face in the hostel—like broken fans, water issues, or food problems—and the staff can respond and solve them faster.

8. Attendance or Check-in Records (For Future Use)

In the future, this app can also be improved to take daily attendance, or even record when students enter and leave the hostel using things like biometric scanners.

9. CONCLUSION

The Hostel Management System I created using Android Studio is a useful and modern way to handle hostel work more easily. With this mobile app, students and hostel staff can do important things like booking rooms, checking fee status, and reporting problems all from their phones, without needing to go to the office.

This system saves time and helps avoid mistakes that usually happen with manual work. It also cuts down on paperwork. The app has helpful features like secure login, instant notifications, and digital records, which make it more organized and easier to use even for people who aren't very good with technology.

There are a few things that still need improvement, like making it work better without internet and adding online payment options. But overall, the app is a strong start and can be made even better in the future. It has the potential to be used in many places like schools, colleges, private hostels, or government-run hostels

To sum it up, this project meets its purpose of making hostel management simple, secure, and easy to manage through a mobile app.

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