

INSTITUTE STUDENT HOSTEL MANAGEMENT SYSTEM APPLICATION

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Abstract - The Institute Student Hostel Management Android Application is designed to provide a digital solution for managing hostel activities in educational institutions. With the increasing number of institutions and hostels, managing hostels manually can be a challenging task. This project aims to address these challenges by developing a user-friendly, GUI-oriented computerized system that is compatible with the existing system. The application's primary objective is to improve the efficiency of the system and overcome the drawbacks of the existing manual system. The application allows students to log in and access a dashboard that provides four main options: canteen, gate pass, suggestions, and counselling. Through the canteen option, students know the canteen food details and get the alert notification before 30 min from the mess timing, while the gate pass option enables students to request permission to leave the hostel premises. The suggestions option allows students to provide feedback and suggestions to the hostel management, while the counselling option provides access to counselling services for students in need. Overall, the Institute Student Hostel Management Android Application aims to provide a user-friendly, efficient and convenient solution for managing hostel activities in educational institutions. The project is developed using Android Studio and Java programming language, and the design methodology includes analysing the existing manual system, identifying the drawbacks, and developing a computerized system that is compatible with the existing system.

KEYWORDS: Gatepass Request, Feedback and Suggestions, Counselling Services.

1. INTRODUCTION

The Institute Student Hostel Management Android Application is a digital solution designed to manage hostel activities for students in educational institutions. As the number of educational institutions increases, so does the demand for student accommodation, resulting in a strain on those managing the hostels. Managing hostels manually can be time-consuming and error-prone, leading to inefficiencies and communication breakdowns. The proposed application aims to streamline hostel management activities by providing a user-friendly and intuitive interface for students. It provides four essential options: canteen, gate pass, suggestions, and counselling. The canteen option

allows students to order food from the hostel canteen, while the gate pass option enables students to request permission to leave the hostel premises. The suggestions option allows students to provide feedback and suggestions to the hostel management, while the counselling option provides access to counselling services for students in need. The project's objective is to improve the efficiency of hostel management activities, making communication between students and management easier, reducing manual paperwork, and increasing transparency in hostel operations. By employing the Model-View-Controller (MVC) design pattern and the Firebase real-time database, the proposed system ensures data consistency and availability across multiple devices. The Institute Student Hostel Management Android Application is expected to enhance the overall experience of students and management, making hostel management more efficient and effective. By addressing the challenges of managing hostels manually, the proposed system will improve efficiency and lead to better hostel management.

2.1. OVER VIEW OF ISHMS

The Institute Hostel Management System Android application is a software tool designed to help manage the operations of a hostel or dormitory within an educational institution. This application provides an easy-to-use interface for managing the various activities associated with managing a hostel, such as managing student records, managing counselling secretary, managing student suggestion, managing gate pass and sending notification to the parents, managing meal plans. Some of the key features of this application include:

Student Management: This feature allows for the easy management of student records, including personal information, gate pass, and meal plans.

Meal Plan Management: This feature allows for the management of meal plans within the hostel, including tracking meal plans, managing menus, and notify meal plan daily.

Overall, the Institute Hostel Management System Android application provides a comprehensive and easy-to-use solution for managing hostel operations within an educational institution.

The overall view of the project is describe in the following figure2.



Fig 2: Overview of ISHMS.

3. SYSTEM DESIGN MODEL

System Design defines a comprehensive solution based on principles, concepts, and properties logically related and consistent with each other. The design has features, properties, and characteristics satisfying, as far as possible, the problem or opportunity expressed by a set of system requirements and life cycle concepts (e.g. operational, support) and is implementable through technologies (e.g., software, services, procedures, human activity). The System Design explores a general solution based on the database and libraries providers. Figure 3 describe the architecture of the project.

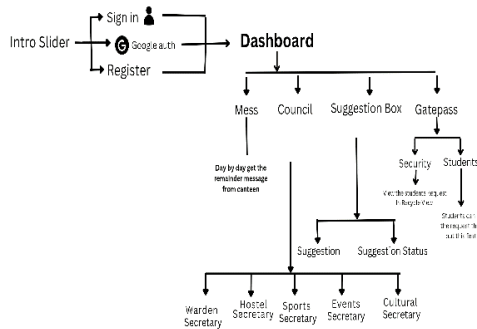


Fig 3: Architecture Diagram.

4. PROPOSED SYSTEM

The Institute Student Hostel Management System (ISHMS) is an Android app-based system designed to streamline and automate the hostel management processes of an institute. The app aims to provide a centralized platform for students, hostel managers, and administration staff to manage hostel-related tasks efficiently. The proposed Institute Student Hostel Management Android Application is a digital solution designed to manage hostel activities for students in educational institutions. The system will be developed using Android Studio and the Java programming language. The system architecture will follow the Model-View-Controller (MVC) design pattern, ensuring separation of concerns between the data model, user interface, and application logic. The system will employ the Firebase real-time database to store and retrieve data,

ensuring data consistency and availability across multiple devices.

4.1. METHODOLOGIES

4. ENVIRONMENTAL REQUIREMENTS

- Android Studio
- Java
- XML
- Firebase Database

4.2.1 ANDROID STUDIO

Android Studio is the official Integrated Development Environment (IDE) for developing Android apps. It is developed by Google and provides a comprehensive set of tools and features to help developers create high-quality Android apps efficiently.

Android Studio is built on the IntelliJ IDEA Community Edition, an open-source Java IDE. It includes a code editor, a visual layout editor, a debugger, an emulator, and various tools for optimizing app performance and testing.

Android Studio supports multiple programming languages, including Java, Kotlin, and C++. It also integrates with various libraries and frameworks, making it easier for developers to add functionality to their apps. Overall, Android Studio is a powerful tool for developing Android apps and is widely used by developers around the world.

4.2.2 JAVA

Java is one of the primary programming languages used for developing Android applications. Here are some of the ways Java is used in Android app development:

Application logic: Java is used to write the core logic of an Android application. This includes code that interacts with the device's hardware, such as the camera or sensors, as well as code that manages the user interface and handles user input.

APIs and libraries: Java-based APIs and libraries are used to provide additional functionality to an Android application. For example, the Java-based Google Maps API can be used to integrate mapping and location services into an app.

Third-party libraries: Many third-party libraries used in Android app development are written in Java, such as the popular Retrofit library for making HTTP requests.

Android SDK: The Android Software Development Kit (SDK), which includes all the tools and libraries needed to develop Android apps, is primarily written in Java.

Cross-platform development: Java can also be used to write cross-platform code that can be shared between different platforms, such as Android and desktop applications.

Overall, Java is an essential language for developing Android applications and provides a powerful and flexible platform for creating a wide range of mobile apps.

4.2.3 XML

XML (Extensible Markup Language) is a markup language used for creating layouts and user interfaces in

Android applications. Here are some of the ways XML is used in Android Studio:

1. Layout files: In Android Studio, XML is used to create layout files that define the visual structure and behavior of the user interface components in an app. These layout files are stored in the app's "res/layout" directory and can be edited in the Android Studio Layout Editor.

2. Resource files: XML is also used to define other resources in an Android app, such as colors, strings, and dimensions. These resource files are stored in the app's "res/values" directory and can be accessed by other parts of the app, including Java code.

3. Manifest files: The AndroidManifest.xml file is an XML file that contains important metadata about the Android application, such as the app's package name, version number, and permissions. It is a required file for all Android apps and is located in the app's root directory.

4. Styles and themes: XML can be used to define styles and themes in Android apps, which can be applied to different user interface components throughout the app.

5. Menu files: XML can also be used to define menus in an Android app, which can be displayed in the app's action bar or other parts of the user interface.

Overall, XML is a crucial part of Android app development, allowing developers to create flexible and dynamic user interfaces, define app resources, and manage app metadata.

4.2.3 FIREBASE DATABASE



Fig 4.2.3 About Firebase DB

Firebase is a backend platform for building mobile and web applications, developed by Google. Firebase provides a range of services and tools for app development, including hosting, database, authentication, storage, messaging, and analytics. Here are the steps to integrate Firebase into an Android Studio project.

Firebase Realtime Database is a cloud-hosted SQL database that lets you store and sync data in real-time between multiple clients. Here are the steps to use Firebase Realtime Database in an Android application.

5. MODULE DESCRIPTION

5.1 INITIALIZING BACKEND USING FIREBASE

Firebase Cloud Messaging (FCM) is a messaging service provided by Firebase that allows you to send notifications and data messages to Android devices. Here are the steps to initialize background messaging using Firebase in an Android application:

Add Firebase to your app: Follow the steps mentioned in the previous answer to add Firebase to your app.

Add the FCM dependency: In your app's build.gradle file, add the FCM dependency.

Create a service to handle messages: Create a new service that extends FirebaseMessagingService and override the onMessageReceived() method to handle incoming messages.

Declare the service in the manifest: Declare the service in the AndroidManifest.xml file.

Test the service: You can now test the service by sending a test message from the Firebase console.

Initializing background messaging using Firebase Cloud Messaging in an Android application involves adding the FCM dependency, creating a service to handle messages, declaring the service in the manifest, and testing the service.

5.2 MODEL IMPLEMENTATION

A model implementation for an Institute student hostel management system would typically include the following entities:

Institute: An entity that represents the educational institution that operates the student hostels.

Hostel: An entity that represents a specific hostel within the Institute. A hostel would typically have a unique identifier, a name, an address, and a capacity (i.e., the maximum number of students it can accommodate).

Student: An entity that represents a student who is staying in a hostel. A student would typically have a unique identifier, a name, an email address, a contact number.

Gate pass: An entity that represents a student have requested gatepass to warden or Hod and the student go out of the college the notification to the parents will send.

Complaint: An entity that represents a complaint or issue raised by a student about their accommodation. A complaint would typically have a unique identifier, a description of the issue, and a status (i.e., whether it has been resolved or not).

The relationships between these entities would typically be modeled as follows:

An Institute can have multiple hostels.

A complaint is associated with a single student, and a student can have multiple complaints.

This model implementation would allow for the efficient management of student accommodation in an Institute by providing a clear and organized way to keep track of student assignments, gate pass and complaints.

5.3 CREATING FRONTEND

To create the front-end for an institute student hostel management system Android app, you can follow these steps:

1. Define the requirements: The first step is to define the requirements for the front-end of the Android app. This includes identifying the features and functionality that the app should have. Some examples include login and registration, room booking, meal ordering, fee payment, etc.

2. Choose a development framework: Once you have identified the requirements, you need to choose a development framework that is suitable for the project. Some popular frameworks for developing Android apps include Android Studio, React Native, and Xamarin.

3. Design the user interface: Next, you need to design the user interface (UI) for the app. This includes creating wireframes and mockups that show the layout and structure of the different screens and pages. You can use design tools like Figma, Sketch, or Adobe XD to create the UI design.

4. Develop the front-end: With the UI design in place, you can start developing the front-end using the chosen development framework. This involves writing code to create the different components and functionality of the app.

5. Test and debug: Once the front-end is developed, you need to test and debug it to ensure that it works as expected. This involves testing the different features and functionality of the app and fixing any bugs or issues that are identified.

6. Deploy the front-end: Finally, you need to deploy the front-end to the Google Play Store or other Android app stores so that it can be downloaded and used by users.

7. Throughout the development process, it is important to keep the user experience (UX) in mind and ensure that the app is easy to use and navigate. Additionally, it is important to follow best practices for security and data protection to keep user information safe.

A front-end developer creates applications using android languages such as xml that allow users to access and interact with the app. When you visit an app, the design elements you see were created by a front-end developer.

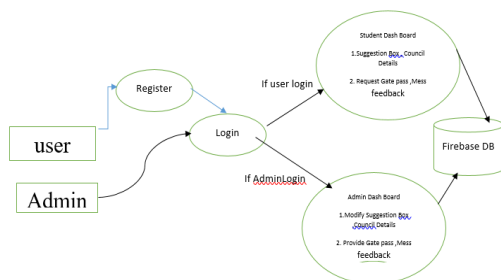


Fig 5.3 creating frontend.

6. EXPERIMENTAL RESULTS

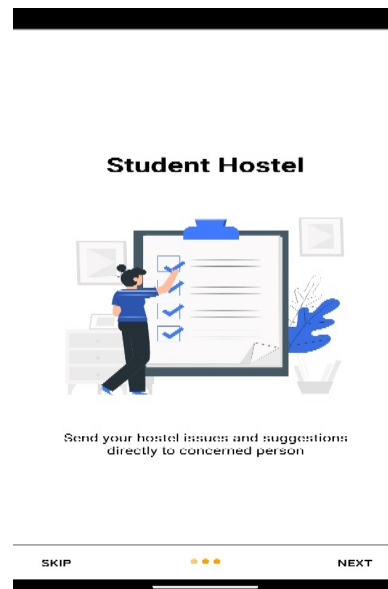


Fig 6.1 Intro page of the app

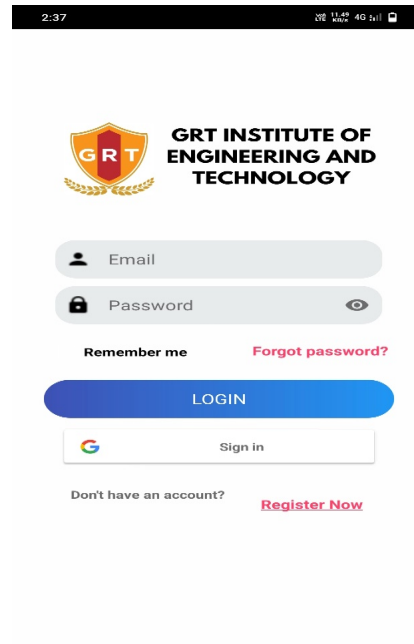


Fig 6.2 Login page

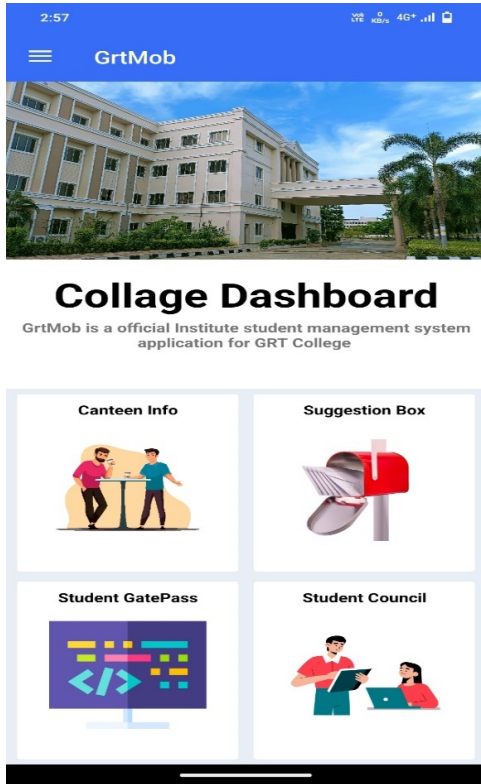


Fig 6.3 Student Dashboard



Fig 6.5 Suggestion Box



Fig 6.4 Mess Menu.

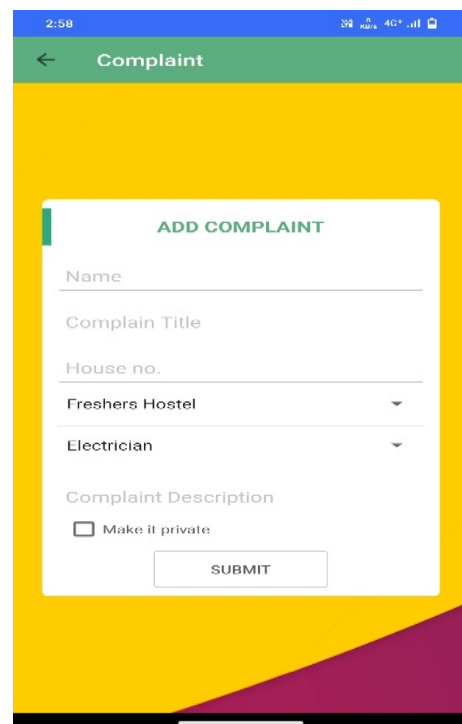


Fig 6.6 Register Complaint

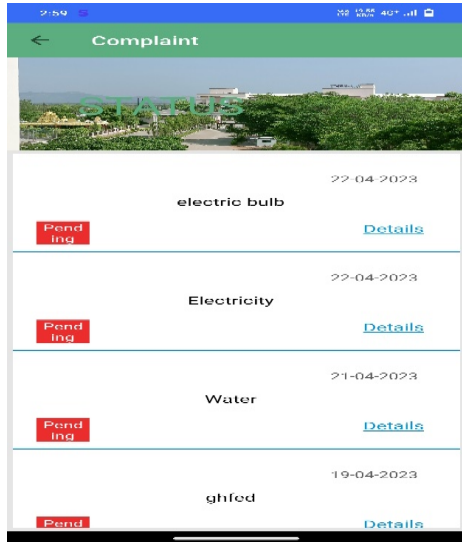


Fig 6.7 Viewing the complaint

valuable tool for managing hostel activities for students. The project's successful implementation will provide benefits to both students and management, improving their overall experience in the hostel. This project can be used as hybrid all the hostels can register themselves and the students can view the mess timing and food routine and suggestion to the management. Also we have added grievance and gatepass management to our project. With a proper Future scope it will be good in use. Other students and management, improving their overall experience in the hostel. We are grateful to our project guide, Prof. Shyamsundar Magar, for providing timely assistance to our query and guidance that he gave owing to his experience in this field for the past two years. He had indeed been a lighthouse for us in this journey. We are grateful to our HOD Dr. Kamal for extending her facilitate directly and indirectly through numerous channels in our project work. We extend our sincerity appreciation to all our faculty members for their valuable within and tip throughout the coming up with of the project. Their contributions are valuable in numerous ways in which we discover it troublesome to acknowledge of them individual.



Fig 6.8 Contact Security Council

9. REFERENCE

- [1] Mr. A.Aswar, Mr. A.Ganesan, Dr. V.Kavitha, Mr. V.Karthicksabri PG & Research Department of Computer Applications, on Hostel Automation system.
- [2] Development of an Automated Hostel Facility Management System Journal of Science and Engineering
- [3] SSRG International Journal of Computer Science and Engineering (SSRG-IJCSE) – volume 3 Issue 4– April 2016 ISSN: 2348 – 8387 www.internationaljournalsrsg.org
- [4] Online Hostel Management International Journal of Advanced Engineering & Science Research (IJAES) Volume 5, Issue 1, March 2017
- [5] SOFTWARE FOR HOSTEL MANAGEMENT SYSTEM Master’s Degree student, 2) PhD., Lecturer
- [6] HOSTEL MANAGEMENT SYSTEM USING SERVICE NOW European Journal of Molecular & Clinical Medicine, 2020, Volume 7, Issue 4, Pages 1078-1084
- [7] Mastering the Management System by Robert S. Kaplan and David P. Norton
- [8] Lore: a database management system for semistructured data Publication:ACM SIGMOD Record
- [9] HOTEL FRONT OFFICE MANAGEMENT THIRD EDITION James A. Bardi, Ed.D., CHA The Pennsylvania State University
- [10] Measuring Hotel Guest Satisfaction by Using an Online Quality Management System Kesh Prasad, Philip W. Wirtz & Larry Yu
- [11] An Optimized System Dynamics Approach for a Hotel Chain Management research gate
- [12] Online computerized Hotel Management System Department of Computer Science & Engineering, Ladoke Akintola University of Technology, Ogbomosho, Nigeria
- [13] Department of Computer Science & Engineering, Ladoke Akintola University of Technology, Ogbomosho, Nigeria

7. CONCLUSION

This project can be used as hybrid all the hostels can register themselves and the students can view the mess timing and food routine and suggestion to the management. Also we have added grievance and gatepass management to our project. With a proper Future scope it will be good in use.

8. ACKNOWLEDGMENT

The Institute Student Hostel Management Android Application is a valuable tool for managing hostel activities for students. The project's successful implementation will provide benefits to the Institute Student Hostel Management Android Application is a

- [14] HOTEL INTELLIGENT BUILDING MANAGEMENT SYSTEM Iuliia Myts1 1National University of Food Technologies
- [15] Pacific Rim Bangkok Hotel needs a new Property Management System January 2013 Cihan Cobanoglu Katerina Berezina
- [16] Online computerized Hotel Management System April 2014
- [17] WEB TECHNOLOGY: A Developer's Perspective Book by J. AKILANDESWARI and N. P. GOPALAN Html CSS JS
- [18] Programming the World Wide Web by Sebesta Robert W.
- [19] Mastering Bootstrap 4 Second Edition Copyright © 2018 Packt Publishing by Benjamin Jakobus, Jason Marah
- [20] JavaScript & jQuery renowned author Jon Duckett Chapter 3

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