

Second Year Mini Project Report

Submitted in partial fulfillment of the requirements of the
degree

BACHELOR OF ENGINEERING IN COMPUTER ENGINEERING

By

Tejas Gadge-D7B/15

Deepak Kumbhar-D7B/24

Ganesh Shelar-D7B/49

Vedant Mhatre-D7B/29

Ummulkiram Mahuvawala-D7A/69

Supervisor

Prof. Mrs. Mannat Doultani



Department of Computer Engineering

Vivekanand Education Society's Institute of Technology

HAMC, Collector's Colony, Chembur,

Mumbai-400074

University of Mumbai

(AY 2023-24)

CERTIFICATE

This is to certify that the Mini Project entitled “**RAILEASE-RAILWAY CONCESSION AUTOMATION AT VESIT**” is a bonafide work of **Tejas Gadge-15, Deepak Kumbhar-24, Ganesh Shelar-49, Vedant Mhatre-29 and Ummulkiram Mahuvawala-69** submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of “**Bachelor of Engineering**” in “**Computer Engineering**”.

(Prof. _____)

Supervisor

(Prof. _____)

Head of Department

(Prof. _____)

Principal

Mini Project Approval

This Mini Project entitled “RAILEASE-Railway Concession Automation at VESIT” by Tejas Gadge D7B-15, Deepak Kumbhar D7B-24, Ganesh Shelar D7B-49, Vedant Mhatre D7B-29 and Ummulkiram Mahuvawala D7A-69 is approved for the degree of Bachelor of Engineering in Computer Engineering.

Examiners

1.....
(Internal Examiner Name & Sign)

2.....
(External Examiner name & Sign)

Date:

Place:

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Abstract

The "**RAILEASE-Railway Concession Automation** " is basically for simplifying the process of applying for and availing railway concession at **VESIT** by creating a mobile application. This app design project leverages the powerful design and development tools, Figma and Flutter, to create an intuitive and visually appealing platform independent interface for users to seamlessly navigate through the concession application process.

The primary objective of this project is to offer a comprehensive solution that addresses the challenges faced by students in order to get student railway concessions at the college. The Railway Concession App will ease the application process, reduce paperwork, and enhance the user experience by providing a digital platform to request and obtain railway concessions. It will provide time to time notification to users.

Acknowledgment

The opportunity of working for RAILEASE was a great chance for learning and professional development. We would like to take this opportunity to express our heartfelt appreciation and gratitude to everyone who is contributing with their continuous guidance for creating the “Railway Concession”. The completion of this report was made possible through the collaborative efforts, dedication, and support of many individuals and entities.

First and foremost, we extend our deepest gratitude to the Head of Department **Dr. Nupur Giri** and supervisor **Mrs. Mannat Daultani** who is actively involved in conceiving and helping with her valuable guidance for designing, developing, and documenting the Railway Concession App project. Their enthusiasm, creativity, and technical expertise were crucial in producing this comprehensive report. A great thanks to all the students who actively participated in the survey which helped in our project.

This project and report symbolize the dedication, hard work, and collaboration that are at the heart of a successful academic endeavor. We hope that the insights and knowledge shared in this report will be of value to our institution and the wider academic community. This project also helps us to develop our skills by learning new languages through the online source available. I would also take a moment to thank my fellow students who helped with brainstorming, discussions, or provided moral support during the project. Once again, thank you all for your contributions, support, and unwavering commitment to the success of this project and report.

Sincerely,

Tejas Gadge 15
Deepak Kumbhar 24
Ganesh Shelar 49
Vedant Mhatre 29
Ummulkiram Mahuvawala 69

Bachelor in Computer Engineering
Vivekanand Education Society Institute of Technology

List of abbreviation:

- Monthly Season Tickets (MST)
- Quarterly Season Tickets (QST)

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Chapter 1 : Introduction

1.1. Introduction

Indian Railways offer concessions for the students traveling for college by railway which is provided by the college. These concessions are offered under certain categories. Students studying away from home or going out for research are offered special concessions. These concessions on travel cost by the railways for which every college has a procedure to be followed.

In an era of digital transformation to enhance and simplify, reduce paperwork, and enhance the user experience by providing a digital platform to request and obtain railway concessions. The " **RAILEASE-Railway Concession Automation**" is a testament to this trend, a mobile application designed to streamline and modernize the process of applying for railway concessions. This report serves as a comprehensive documentation of the conception, development, and evaluation of the railway concession system at college.

Railway concessions are essential for students as it provides concessions and saves the traveling cost. **The process of applying for these concessions has traditionally been characterized by *paperwork, queues, and sometimes confusion*.** To address these challenges and to offer a more user-friendly and efficient solution, our team embarked on the journey of creating the Railway Concession App..

This report details the various stages of the app's development, from the initial ideation to design, implementation, and testing. It aims to provide a complete understanding of the project's objectives, methodologies, outcomes, and potential impact.

1.2. Motivation

The motivation for creating the "RAILEASE-Railway Concession Automation" was rooted in the recognition of several pressing issues and a deep commitment to providing a practical, innovative solution. The key motivations for embarking on this project were as follows:

1.Simplifying Processes:We developed the app to make applying for railway concessions, especially for students, much easier. Before, it was all about filling out tons of paperwork and waiting in long lines at the train stations. With the app, you can skip all that hassle and apply right from your phone or computer. It's all about simplifying things and cutting out the paperwork.

2.Enhancing User Experience: The motivation was to put the user's needs and experience at the forefront of the concession application process. We aimed to develop an app that would be intuitive, user-friendly, and accessible to individuals of all age groups and abilities.

3.Digital Transformation: In an increasingly digital world, there is a growing demand for digital solutions that simplify everyday tasks. The motivation was to leverage technology to bring railway concession applications into the digital age, making it easier and more efficient for users.

4.Reducing Ambiguity: Eligibility criteria for railway concessions can sometimes be unclear, leading to confusion and frustration among users. The app aimed to provide clarity by clearly defining eligibility and requirements, reducing ambiguity in the process.

5.Empowering users(Students): We were motivated by the concept of empowering users by giving them greater control and transparency in the application process. The app equips users with the tools and information they need to confidently apply for concessions, fostering a sense of independence and self-reliance.

1.3.Problem Statement & Objectives

The problem at hand is to design and develop a user-friendly mobile application using flutter which is accessible to both macOS and android users that simplifies the process of applying for and availing railway concessions. The key issues to address include the current process for applying and availing railway concessions is time-consuming. User, especially those eligible for concessions, face difficulties in understanding the eligibility criteria, gathering necessary documents, and navigating through the application process. The manual verification and approval process for concession applications can lead to delays and errors. users often experience lengthy waiting times for approvals, leading to inconvenience and frustration. The railway authorities need to implement robust fraud prevention mechanisms to ensure that concessions are provided only to eligible users and prevent misuse.

It will also streamline and modernize the process of granting concessions to specific groups of students who registered and apply using the application. Concessions are discounts or special rates offered to certain categories of students according to the criteria specified by the student. This application will specially work in order to make the process handier by making it efficient, allowing for a faster and more streamlined process, reducing the burden on railway staff and students. It is essential to develop an app that is accessible to all users, including those with disabilities. The app should provide options for various accessibility features, making it inclusive and user-friendly for all. The app will integrate with existing railway systems, databases, and backend processes to ensure a smooth flow of information and approvals.

It is crucial to maintain high-level security to protect user data, including personal and financial information, and ensure compliance with data privacy regulations can be maintained using this app. The app should be designed to accommodate future developments and expansions in the railway concession system, as well as changing technologies and user needs.

The objectives of creating “RAILEASE-Railway Concession Automation” are as follows:

Simplify Concession Application Process: The primary objective is to simplify and streamline the process of applying for railway concessions. The app should make it easy for eligible users to understand and complete the application, reducing paperwork and bureaucratic hurdles.

Notify: Send the notification about the update.

Improve User Experience: Enhance the overall experience for users by providing a user-friendly interface and eliminating the need for users to visit physical offices or wait in long lines to apply for concessions.

Efficient Approval and Verification: Expedite the approval process for concession applications through digital verification and automation, reducing processing times and eliminating delays.

Enhance Information Accessibility: Make comprehensive information about available concessions, eligibility criteria, and required documentation easily accessible within the app to inform users about their entitlements.

Prevent Fraud and Misuse: Implement robust fraud prevention mechanisms to ensure that concessions are granted only to eligible users, thereby preventing misuse of the system.

Feedback and Improvement: Collect user feedback to continuously improve the app and adapt to changing student needs and preferences.

Promote Digitalization: Encourage the adoption of digital solutions within the railway concession of the college, aligning with broader efforts to modernize and improve the efficiency of transportation systems.

Customer Satisfaction: Ultimately, the app's objective is to enhance customer satisfaction by simplifying the process of obtaining concessions and improving the overall railway journey for users.

These objectives collectively aim to create a Railway Concession App that not only benefits users but also leads to increased efficiency and transparency within the railway industry while promoting accessibility, inclusivity, and data security.

1.4. Organization of the project

Chapter 1	Discuss about the Introduction of the Project.
Chapter 2	Discuss about the Literature Survey & it focuses on how to push notification in firebase.
Chapter 3	Discuss about the Proposed System and conclusion part of the Project.
Chapter 4	Discuss about the Experiment Results and Conclusion of the Project

Chapter 2: Literature Survey

2.1 Survey of Existing System:

We had carried out a survey in order to find what and how the existing system been working and what all difficulties the student is facing in order to get the railway concession form in the college. Through the whole process we encountered many updates about the problem faced by the students.

The Indian railway scheme under which every student is eligible but to get in that concession there is a certain procedure to be followed which include a lot of steps:

1. You get mail from college about the railway concession with the form attached and for getting the concession the first and foremost step is to fill the form which is attached. All the details such as your name, college ID, year , roll no, Aadhar card details, etc and submit the form.
2. Once you fill in the details you get a reply to that mail then you become eligible for the railway's concession.
3. Then you have to produce this form in front of the booking counter to get a monthly pass.
4. You can get 1st class or 2nd class pass monthly/ Quarterly or Yearly whatever you want as you have mentioned in the form.
5. As you submit all the required documents then they tell you the date when the concession form will be made available.
6. As many students apply for the same , there are many students waiting in line for the railway concession.
7. And also, many students apply but don't take the form then the form which comes from the Indian railway is also wasted.
8. Thus, the whole procedure is very time consuming and the lot of paperwork is involved.

2.2 Limitation Existing system or research gap:

According to the survey most of the students are facing a lot of difficulties as they have to go through such a long and time-consuming procedure. The existing railway concession system had several gaps and shortcomings, which contributed to the need for the introduction of online railway concession systems. Some of the notable gaps in the traditional offline system included:

1.Long Queues: Students had to physically visit offices to submit the document. This often led to long queues and inconvenience for students.

2.Paperwork: Applicants had to fill out physical forms and provide physical documentation, which added to the paperwork and could be burdensome.

3.Verification Delays: Verification of documents and eligibility was often done manually, leading to delays and sometimes even errors in granting concessions.

2.3 Mini Project Contribution:

The "RAILEASE-Railway Concession Automation" to streamline and modernize the process of granting concessions to specific groups of students who registered and applied using the application. Concessions are discounts or special rates offered to certain categories of students according to the criteria specified by the student. This application will specially work in order to make the process handier by making it efficient, allowing for a faster and more streamlined process, reducing the burden on railway staff and students.

Student portal:

The application will also include the list of steps as to how you can apply for the concession. The application will allow you to register yourself by submitting all the required documents such as Aadhar card, photo, etc. Once you are done with the registration you get a proper slot allotment and you can go to the office counter and collect the railway concession at the time. Also, the student has registered to get the concession he or she will get the required notification about the updates. The student is also allowed to give feedback related to the app. The remainder to students about the collection of the railway concession form is sent. Thus, automating and making the application user friendly and simplifying the work of the student.

Admin portal:

This portal is managed by the staff who is responsible for making the railway concession available. They get a proper platform and work space which also automates their work and reduces the effort. This will automate processing features that reduce the need for manual data entry and verification. This streamlines the workload for concession in charge personnel, allowing them to focus on more critical tasks. The online system creates an efficient workflow, as applications and requests can be handled electronically. This leads to faster processing of concession requests, reducing the workload on concession incharge staff. With the online system, concession incharge personnel spend less time dealing with paperwork and administrative tasks associated with manual processing. This frees them up to perform more strategic and value-added activities.

The RAILEASE-Railway Concession Automation simplifies and streamlines the tasks of concession in charge personnel. It reduces administrative burdens, enhances accuracy, and provides valuable data for decision-making. These benefits ultimately lead to more efficient and effective management of concessions, resulting in improved customer service and satisfaction for railway users.

Chapter 3: Proposed System : RAILEASE-Railway Concession Automation

3.1. Introduction:

RAILEASE is related to the initiative for VESIT (Vivekanand Education Society's Institute of Technology) students to make available a digital platform where they can focus on providing hassle-free concessions and automating the concession process. The primary purpose is to make it easier for eligible students to avail of concessions, such as travel discounts or benefits. The application is a testament to this trend, a mobile application designed to streamline and modernize the process of applying for railway concessions. This report serves as a comprehensive documentation of the conception, development, and evaluation of the railway concession system at college.

Railway concessions are essential for students as it provides concessions and saves the traveling cost. The process of applying for these concessions has traditionally been characterized by paperwork, queues, and sometimes confusion. To address these challenges and to offer a more user-friendly and efficient solution, our team embarked on the journey of creating the Railway Concession.

This report details the various stages of the app's development, from the initial ideation to design, implementation, and testing. It aims to provide a complete understanding of the project's objectives, methodologies, outcomes, and potential impact.

3.2. Architecture/ Framework

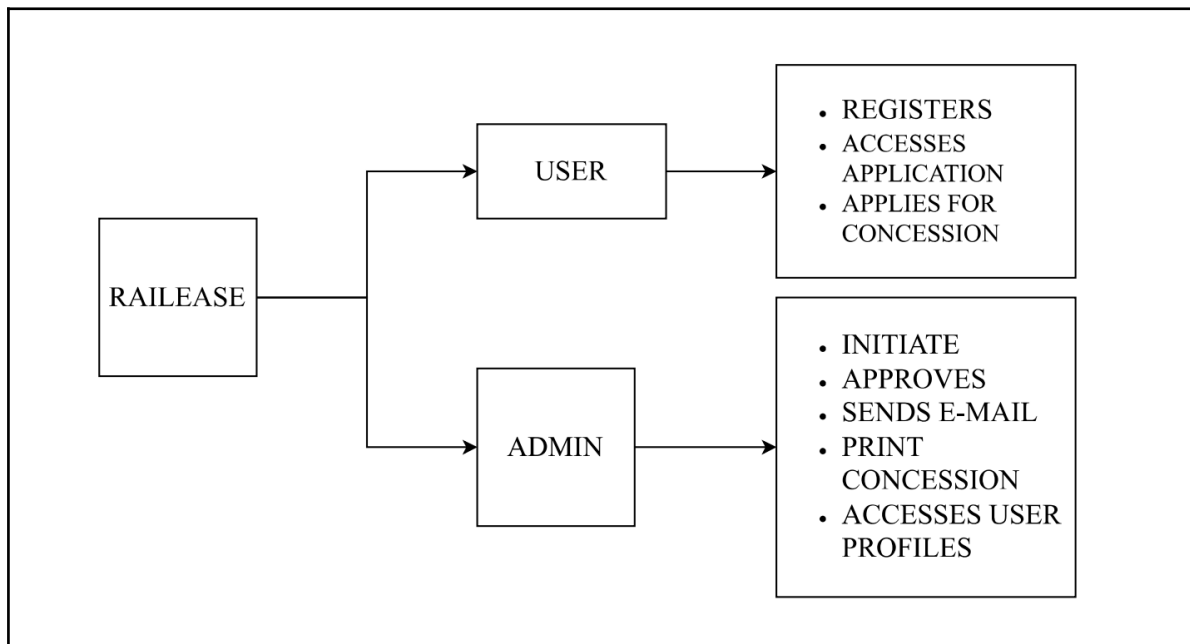


Fig 3.2.a Flow Chart of accessibility

This basically discusses an idea about how the student & admin portal would be functioning and the operations performed by them.

3.3. Algorithm and Process Design

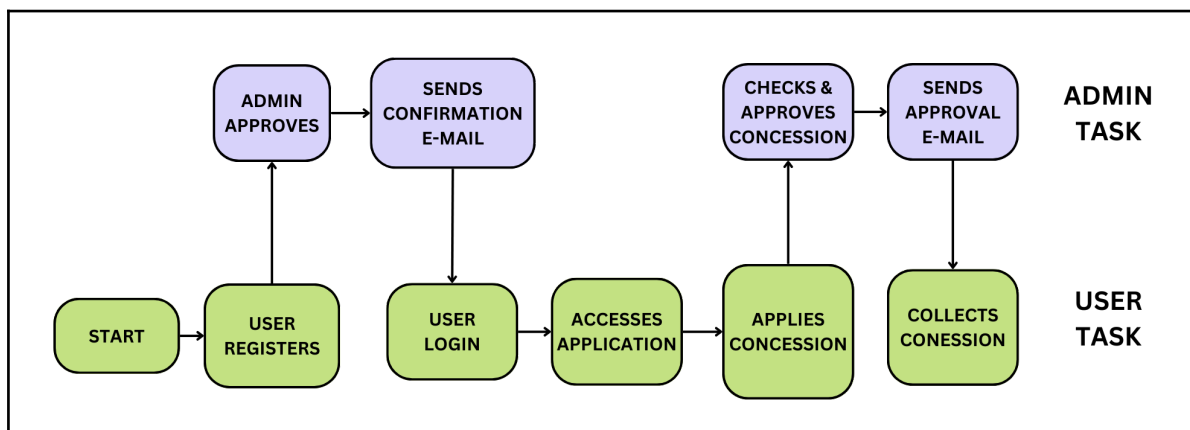


Fig 3.2.b: System UI Student Portal

This shows the brief structure of our student portal i.e. how the process is taking place. It enlists the different screens which have different functionalities.

3.4 Details of Hardware & Software

HARDWARE:

- Minimum 4GB RAM
- 512 GB SSD
- Windows OS

SOFTWARE

- Mobile app development frameworks (e.g., Flutter)



- Backend development tools (e.g.java)



- Database management systems (Firebase):



- Dart



3.5 Experiment and Results

3.5.1.a Student portal :

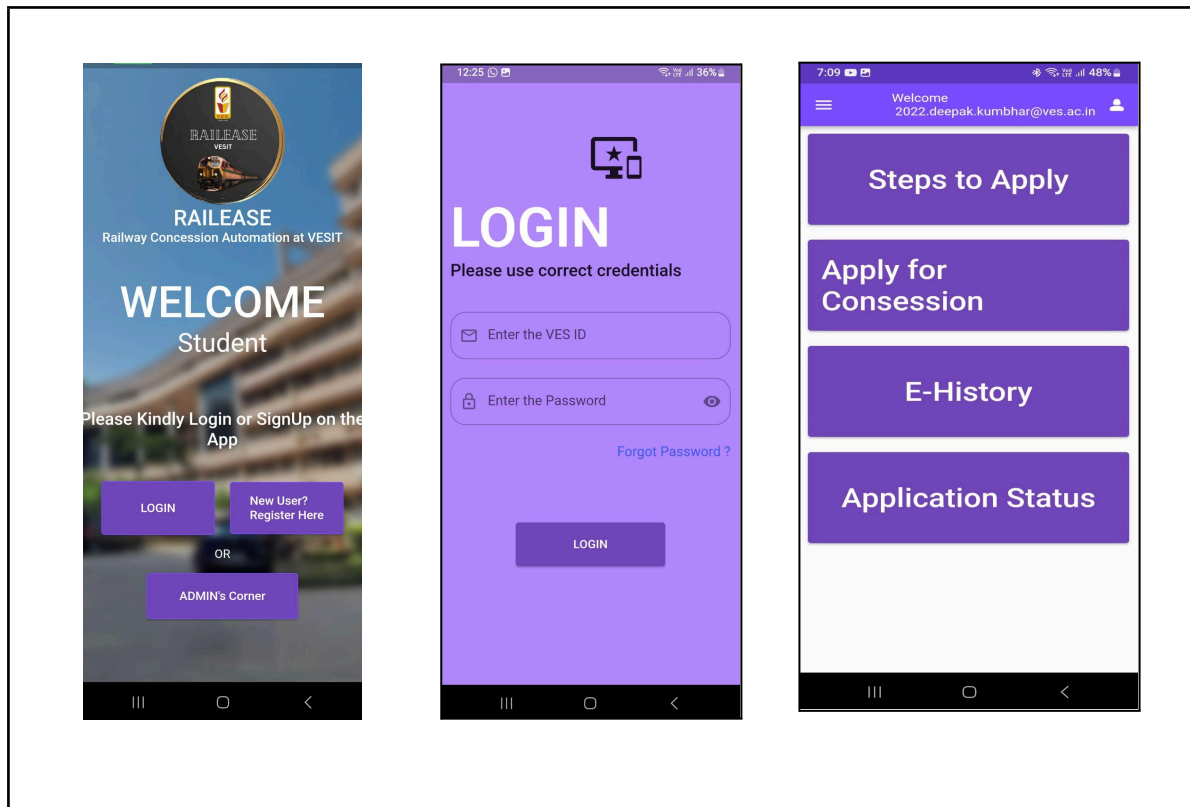


fig 3.5.1.a Login & Home Page of admin Portal

Login and Home Page: The above Screens show the student login. It also shows the Home page of the student portal through which the user can access all the stuff in the app. The Scroll bar gives the ease in accessing the stuff of users' portal.

The figure displays three mobile application screens related to user registration and profile management.

Screen 1: New User Registration - Info
 This screen is the first step in the registration process. It features a purple header with a back arrow and the title "New User Registration". Below the header, a vertical progress indicator shows "1 Info" as the active step. The form includes input fields for "Full Name", "Gender", "Address", "Mobile-No", and "Email-ID(other than ves-id)". There is an "Upload Documents" button and a "Selected Documents:" section. At the bottom, there are "CONTINUE" and "CANCEL" buttons.

Screen 2: New User Registration - Academic Info
 This screen is the second step in the registration process. It has a purple header with a back arrow and the title "New User Registration". The progress indicator shows "1 Info" and "2 Academic Info". The form includes input fields for "VES-ID", "Admission Year", "Expected Gradutaion Year", "Branch", "Division", and "Roll Number". There is a "Submit" button and "CONTINUE" and "CANCEL" buttons at the bottom.

Screen 3: Profile
 This screen shows the user's profile. It has a purple header with a back arrow and the title "Profile". Below the header, there is a user icon placeholder, the text "WELCOME", and a purple button labeled "DEEPAK KUMBHAR". The profile details are listed below: "Roll No: 24", "Branch: CMPN", "VES_ID: 2022.deepak.kumbhar@ves.ac.in", "Phone No: 7262914841", and "Suburb: BADLAPUR".

Fig.3.5.1.bProfile And Registration

The Profile and Registration feature provides comprehensive user profiles for students. New users are guided through a detailed application process for railway concessions, ensuring clarity at every step. The registration form collects necessary user information, triggering a confirmation notification upon completion.

3.5.2 Notification and Reminders

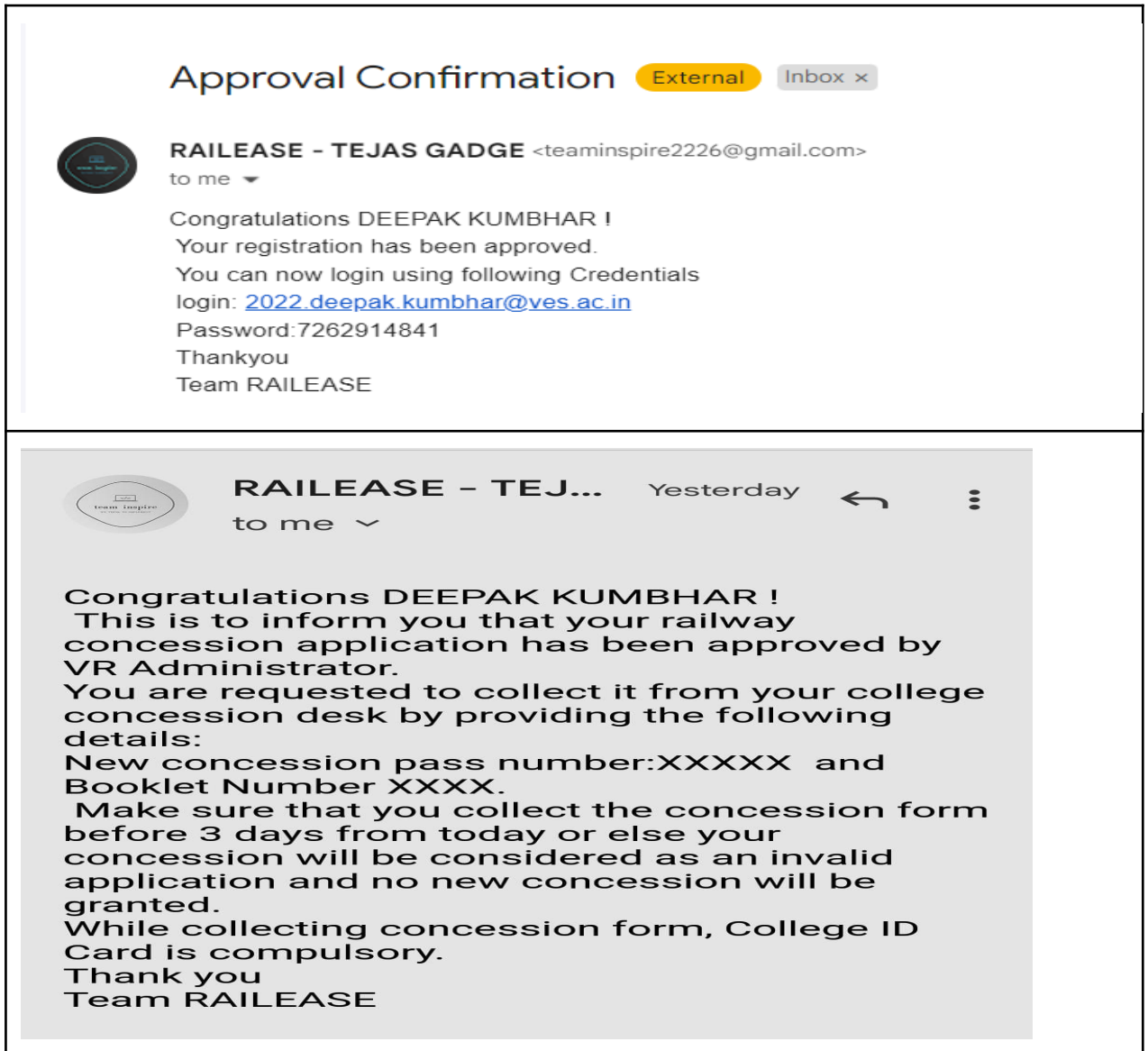


Fig 3.5.2.(a) Approval Notification

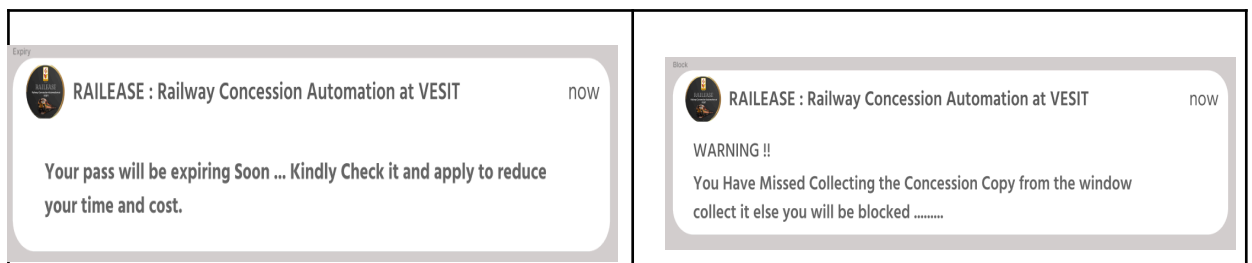


Fig 3.5.2.(b) Reminder Notification

As per our commitment we would be adding the time to time notifications & reminders, following that we have been adding the notifications and reminders accordingly and the above is the required proof for it.

3.5.3 Admin Portal

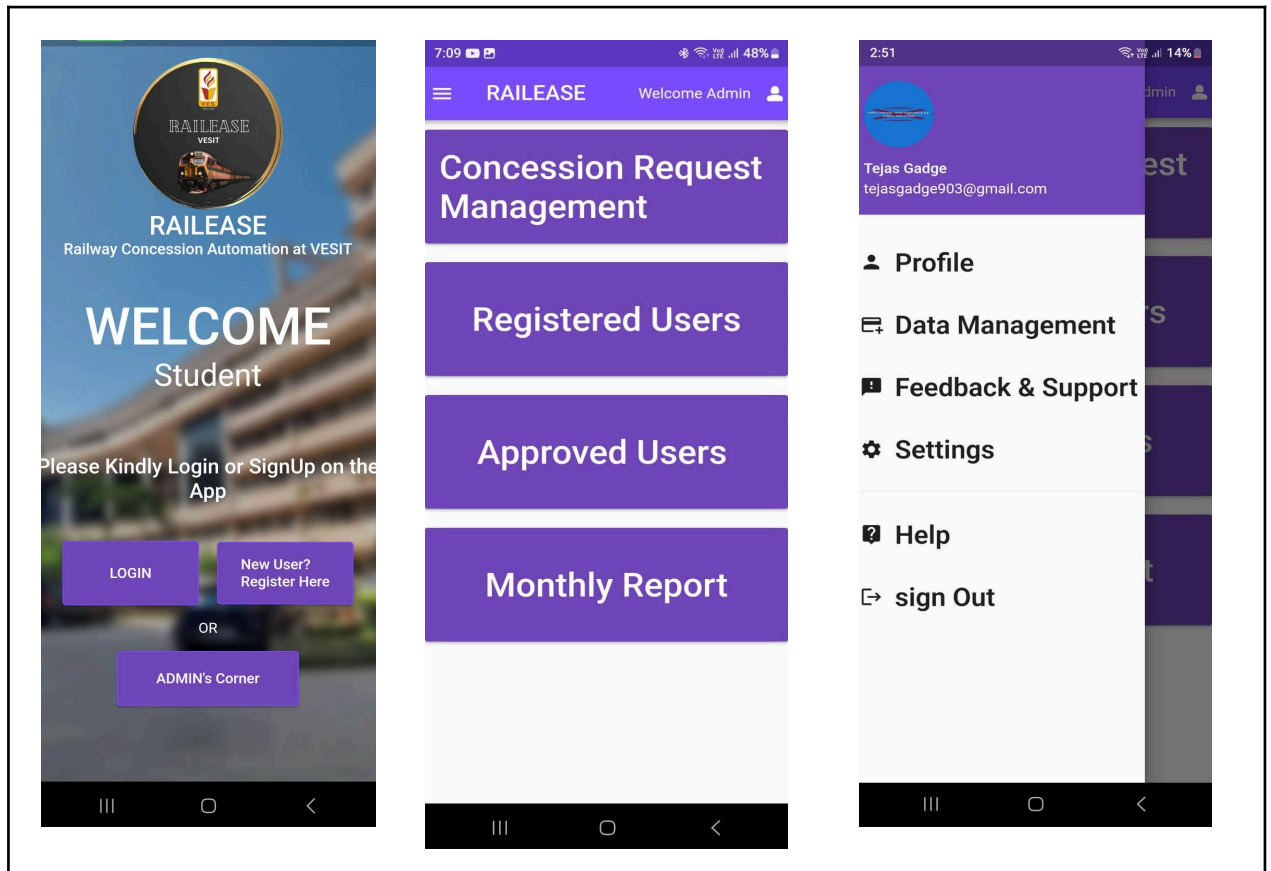


fig 3.5.3.a Home Page Of Admin Portal

UI of admin home page:As we log in through the home page it displays the tabs through which admin will approve the concessions of student.As shown in third figure through which admin can access settings and can backup data of students.

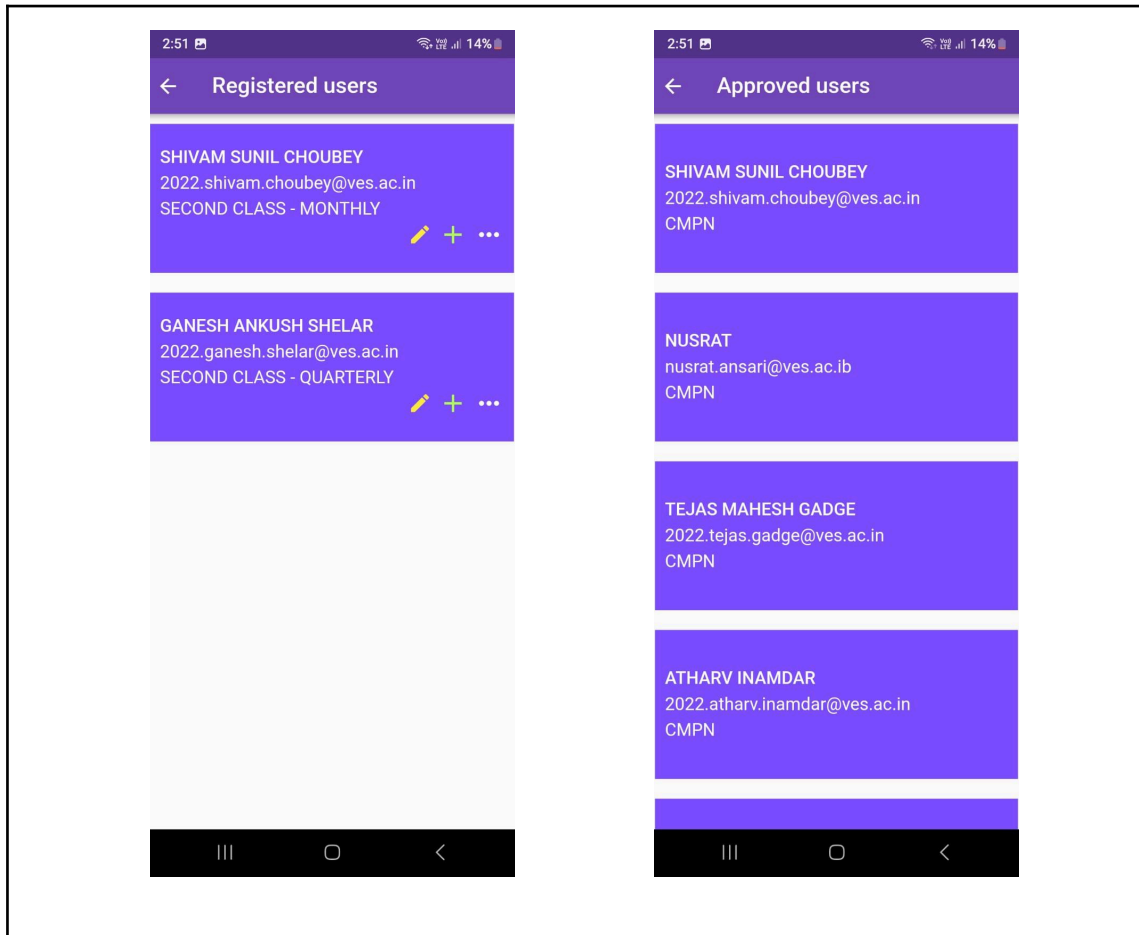


fig.3.5.3.b. Tabs of Registered and Approved User

Registered and Approved Users: When a new user registers through the student portal, their details appear in the "Registered Users" section. After admin approval based on concession eligibility, the user is listed in the "Approved Users" tab.

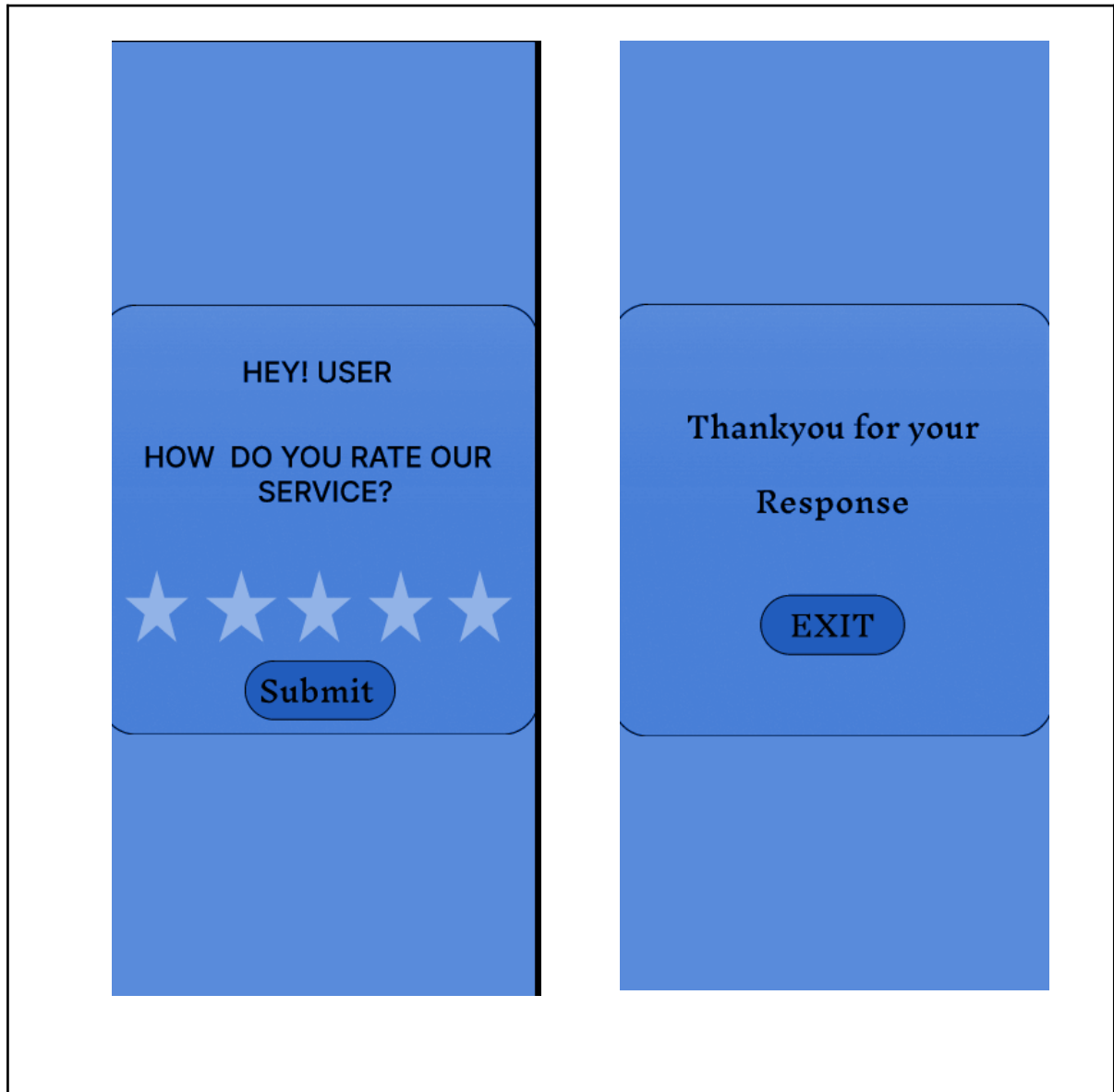


Fig.3.5.4:Feedback and review system of app

Feedback and review of app: Students can submit reviews while exiting the app.

Conclusion & Future Work

The development of the "RAILEASE" app marks a significant advancement in modernizing and optimizing the process of applying for railway concessions. This innovative solution addresses critical challenges by offering a user-friendly platform that streamlines concession requests, reducing administrative burdens and waiting times for VESIT students and railway staff.

By automating processes, the app accelerates request processing, resulting in faster approvals and an enhanced travel experience for eligible users. Its intuitive interface ensures accessibility for a wider range of users, regardless of location or physical limitations.

In essence, the RAILEASE app represents a transformative approach to managing railway concessions, aligning with the demand for technology-driven solutions that improve user experiences, operational efficiency, and sustainability. It has the potential to revolutionize concession management, making travel more accessible, efficient, and transparent for users while providing benefits to railway authorities through enhanced data management and transparency.

Chapter 4: Achievement



Our team has emerged victorious in the BuzzPro competition, securing the Best Presentation Team award! Among the team members **Deepak Kumbhar**, **Tejas Gadge**, **Vedant Mhatre**, **Ganesh Shelar**, and **Ummulkiram Mahuvawala**. **Tejas Gadge** was awarded the title of "Best Presenter".

This project, aimed at simplifying railway concession processes for VESIT students. This achievement wouldn't have been possible without the support and encouragement from our **mentors Prof. Mannat Daultani**. The win underscores the team's dedication to innovation and making a difference.

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