



PES UNIVERSITY

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Capstone Project Report Phase-2

on

DIGITAL BUS-PASS SYSTEM

Submitted by

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Feb 2024 – June 2024

under the guidance of

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FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER APPLICATIONS
PROGRAM – MASTER OF COMPUTER APPLICATIONS

CERTIFICATE

This is to certify that the project entitled

DIGITAL BUS-PASS SYSTEM

is a bonafide work carried out by

KARTHIK RAMESH HEGDE

(PES1PG22CA094)

in partial fulfilment for the completion of Capstone Project, Phase-2 work in the Program of Study MCA under rules and regulations of PES University, Bengaluru during the period Feb. 2024 – June 2024. The project report has been approved as it satisfies the academic requirements of 4th semester MCA.

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I, **KARTHIK RAMESH HEGDE**, bearing **PES1PG22CA094** hereby declare that the Capstone project phase-2 entitled, ***DIGITAL BUS-PASS SYSTEM***, is an original work done by me under the guidance of **Ms. Sumitha Chandran**, Assistant Professor, PES University, and is being submitted in partial fulfilment of the requirements for completion of 4th Semester course in the Program of Study **MCA**. All corrections/suggestions indicated for internal assessment have been incorporated in the report.

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The plagiarism check has been done for the report and is below the given threshold.

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ACKNOWLEDGMENT

Life enhances better opportunity with better blessings with adequate space and time. It was a great blessing for doing this Project titled “DIGITAL BUS-PASS SYSTEM”, where I have put into all my efforts and dedication towards it resulting in getting undiscovered knowledge, better experiences, and ideas behind. To give brighter and broader measures there has been a few concerns supportive to make this project to be real time application, without which my project would have been meaningless.

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I would also like to extend my thanks and gratitude to every faculty of Department of Computer Applications and to my family inmates and friends who were concerned for the project.

Thank you everyone.

KARTHIK RAMESH HEGDE

ABSTRACT

The Digital Bus Pass app offers a number of features designed to make travel easier and promote environmental sustainability. Users can access information systems, manage accounts, renew passports, make payments, and use special QR codes to renew passwords. The program also provides customer support resources including discussion support, supporting documentation, and Q&A sections. These features include account management, pre-departure briefings, travel negotiations, registration and communication support. With seamless integration with existing bus services, the technology assures access to digital payment options, QR code-based passing and fast registration options.

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CHAPTER 1. INTRODUCTION

1.1 PROJECT DESCRIPTION

1.1.1 Problem Scenario

The current bus transportation system faces many challenges, which contribute to its inefficiency and poor user experience. The existing system is incredibly time consuming, with cumbersome processes that require too many people to achieve too few results. Excessive manual processing in the system not only hinders overall efficiency, but also increases labor costs and leads to more errors. Data security is a major concern in the current system, as people who do not have access or loss access to sensitive information.

1.1.2 Proposed Solution

The proposed answer is a consumer-centric Digital Bus Pass app designed to optimize the overall travel revel in. Users can affects join up at the platform and receive a customized QR code for his or her skip, getting rid of the want for a bodily card. They simplify the brand-new passport system, ensuring well timed reminders and clean get entry to public transportation. Bus operators can advantage from efficient QR code scanning for passing, improving protection and growing operational efficiency.

1.1.3 Purpose

The objective of this task is to develop capable bus pass control thru implementation, which consists of the device and the want for duration and length. You can get admitted into a utility form, or get a new bus pass affects you can upgrade an existing one, in which the device presents special records about the consumer's bus adventure at the time of registration.

1.1.4 Scope

The scope of the undertaking is to expand a flexible and efficient system to facilitate public transportation, especially to satisfy the needs of college students and workforce. It focuses on maintaining public transportation clean and handy, imparting a hassle-unfastened and reliable each day commuting revel in. This software targets to take away confusion and decorate the general travel enjoy for everyone with the aid of supplying simple and complete solutions.

CHAPTER 2. LITERATURE SURVEY

2.1 DOMAIN SURVEY

2.1.1 Transportation:

The important recognition of area research is transportation, particularly facilitating bus transportation management and verification approaches. This includes digital solutions that use generation to increase productiveness.

2.1.2 Technology:

The plan is to use QR code generation and scanning strategies to create a easy and paperless bus bypass machine. This generation not only ensures accuracy, but additionally contributes to an environmentally friendly and efficient public transportation system.

2.1.3 User Experience:

User enjoy is a critical part of the business, and the method consists of providing simplicity via sturdy account management capabilities. Users can have the potential to without difficulty sign in, receive a customized QR code and manage their bus pass details within the software. Timely reviews will similarly make contributions to a high-quality person experience by way of preserving passengers knowledgeable of essential updates, passport renewals and different applicable statistics.

2.1.4 Customer Service:

Additionally, area studies are exact in customer service merchandise, recognizing the importance of user support. The plan is to combine a complete aid system including regularly asked questions (FAQs) and direct communicate channels. This ensures that users have get right of entry to relevant records and can quick seek help, ensuing in both a satisfying and person-friendly experience in the travel organization.

2.2 RELATED WORK

RESEARCH PAPER-1

Title: Biometrics Based Bus Ticketing System.

Author: Abhishek Balu, Krishna Raja, G Thamaraiselvi, R Prabha, V Narasimhan

Publication: Research Gate

Year of Publish: 2018

Description: Introduced an innovative biometric-based totally bus ticketing device that transforms traditional ticketing procedures by means of incorporating fingerprint reputation era. This new machine targets to automate and simplify the ticketing revel in, reducing paper usage and growing general efficiency.

RESEARCH PAPER-2

Title: Bus Management System Using RFID In WSN

Author: Ben Ammar Hatem, Habib Hamam

Publication: Research Gate.

Year of Publish: 2010

Description: The paper provides a wise bus management gadget combining RFID and WSN for real-time bus inspection at huge stations, the use of ZigBee for communication. It complements power efficiency, expands readability, and tightly video display unit's systems, presenting actual-time updates to enhance public transport overall performance and improve passenger pleasure.

RESEARCH PAPER-3

Title: Bus Pass Mobile Application Using QR Code.

Author: Jivan Shelke, Aniket Mahangde, Sagar Karwa, Vishwajeet Mane.

Publication: IRJET

Year of Publish: 2018

Description: The machine includes GPS-based totally real-time bus monitoring, QR-code ticketing, direction making plans, on-line bus journey programs, and a reminder gadget to enhance consumer enjoy has been developed to facilitate public delivery structures.

RESEARCH PAPER-4

Title: Bus Pass QR Code Scanner.

Author: Mrs. Poonam Thakre, Mr. Rohan Darji, Mr. Aaryen D'Souza, Mr. Maharsh Bajpai

Publication: JETIR.ORG

Year of Publish: 2022

Description: The Bus Pass QR code scanner system makes use of a cellular software that gives QR code authentication in area of a bodily pass. Instead of playing cards, QR codes are a short and easy manner for passengers to run after they board the bus.

RESEARCH PAPER-5

Title: Efficient Bus Pass Generation and Authentication using QR Code.

Author: N. Krishnammal, Ramya C, Shiva Ganesh K, ShrenidhiR

Publication: IJITEE

Year of Publish: 2020

Description: The venture goals to develop a web platform using QR codes to simplify the issuance of bus permits, increase efficiency, reduce paperwork and ensure safety. The platform will involve college students run with the aid of college directors in conjunction with evidence and consists of things like OTP verification, online bills, new notifications that may be.

2.3 EXISTING SYSTEM

2.3.1 Chalo:

Chalo is a flexible navigation platform designed to make normal navigation simpler for customers. This complete software offers actual-time facts about buses, routes and schedules, empowering customers to higher plan their journeys. With user-friendly interfaces, Chalo enhances the tour enjoy via providing up to date records on bus stops and arrival times, allowing customers to make informed choices in terms of transportation, bridging the facts gap among commuters and public shipping, Chalo It goals to make ordinary journey easier and more predictable.

2.3.2 Tummoc App:

Tummoc stands as the first public delivery infrastructure to offer actual-time facts on bus schedules and ridership. Operating in over 18 cities in India, Tummoc gives an entire answer for travellers. The app allows customers to view buses in real time, supplying perception into their current locations and anticipated arrival times. Additionally, Tummoc offers alert functions to notify customers of delays, ensuring they remain aware and might alter their journey plans consequently. The app goes similarly by way of allowing users to seamlessly write tickets, imparting a one-prevent solution for all their public transportation needs.

2.3.3 Smart Pass:

Smart Pass represents a sophisticated digital skip ticketing system that uses generation to facilitate get entry to activities, travel services, or venues. This utility provides users with a smooth and green manner to manage and digitally authenticate their passes. For public transportation, events, or groups, the Smart Pass reduces the cost of actually the use of a price ticket or passport, making it less difficult to apply. Utilizing modern-day era, this digital bypass machine pursuits to offer a seamless and secure experience, helping to enhance ordinary accessibility in a lot of settings.

Table 2.1 System Comparison Overview

Features	Chalo	Smart Pass	Tummoc App	Digital Bus-Pass System
User Registration	Y	Y	Y	Y
QR Code-based Pass	N	N	N	Y
Pass Renewal	N	N	N	Y
Account Management	Y	Y	Y	Y
Payment Integration	Y	Y	Y	Y
Notification System	Y	N	Y	Y
Customer Support	Y	Y	Y	Y

2.4 TECHNOLOGY SURVEY

2.4.1 ANDROID STUDIO

Android Studio is an authentic incorporated improvement environment (IDE) for Android app improvement. Based on IntelliJ IDEA's powerful code editor and developer tools, Android Studio offers even greater capabilities that improve your productiveness whilst growing Android apps.

2.4.2 JAVA

Java is a flexible and extensively used programming language, acknowledged for its platform independence. It's used for diverse applications, including web and mobile development (Android). The Java Development Kit (JDK) provides tools for Java application development, and the Java Virtual Machine (JVM) enables cross-platform execution. Java has two main editions: Standard Edition (SE) for desktop applications and Enterprise Edition (EE) for large-scale enterprise applications. Android apps are often developed using Java. The Spring Framework simplifies enterprise Java development. Java has an active global community and is integral to various aspects of software development.

2.4.3 FIRE-BASE

Firebase is an app development platform that helps user build and grow apps and games users love. Backed by Google and trusted by millions of businesses around the world. It is a set of backend cloud computing services and application development platforms provided by Google. It hosts databases, services, authentication, and integration for a variety of applications, including Android, iOS, JavaScript, Node.js, Java, Unity, PHP, and C++.

2.5 FEASIBILITY STUDY

The feasibility study of the digital bus pass system examines financial, technical, operational and organizational effectiveness and assesses its effectiveness. Its objective is to determine feasibility and optimal implementation within time and budget. From an economic perspective, the study examines costs, savings from reducing paper usage, and long-term financial sustainability. Technically, it looks at design, materials, and compatibility with existing systems. Business efficiencies require integration to influence the adoption rate of current services and users. To the extent possible, planning ensures timelines and points are correct. This study confirms that the digital bus transportation system is a viable and innovative solution aimed at transforming public transportation, making it easier, more efficient and more cost-effective.

Three key considerations involved in the feasibility analysis are:

2.5.1 Economic Feasibility

The digital bus bypass machine is cost-efficient because it appreciably reduces operating fees for transit companies and their users. It reduces labor costs and associated charges with the aid of putting off the want to print, distribute and manipulate bodily licenses. This system also reduces transaction fees, decreasing the risks of theft and fraud. Additionally, it presents possibilities to generate revenue thru advertising and sharing. Carriers can distribute freight more successfully, reducing the need for bodily infrastructure such as price tag booths. It gives a simple and green manner for customers to purchase and manage bus passes, lowering the hazard of lost or stolen passes and lowering the need for bodily touch on.

2.5.2 Technical Feasibility

The virtual bus skip device is technologically responsive as it carries existing technology together with cellular programs, QR code generation and charge gateways to create programming languages and packages which are widely to be had and integrated into the contemporary navigation device so device removed by means of cutting-edge smartphones, is like minded with cellular networks, and scalable to match more than one user and networks. It helps faraway maintenance and updates, reduces downtime, and will increase security and productiveness. Comprehensive security features, such as encryption and security controls, guard

consumer information and save you unauthorized get admission to. Furthermore, the flexible and scalable design of the system enables innovation growth in consumer desires and technological advances.

2.5.3 Operational Feasibility

The digital bus pass device works well due to its smooth-to-use layout and minimal necessities, maximum successfully requiring cell phone and net use can be maintained and up to date remotely, ensuring that volatile protection and performance. Users should purchase and manipulate their passports seamlessly, reducing physical touch and decreasing the threat of loss or theft. Real-time updates assist customers higher plan their journeys. The tool can additionally display and manage snap shots for the logistics industry, together with guidelines for usability improvements to beautify the provider's common adventure.

CHAPTER 3. HARDWARE AND SOFTWARE REQUIREMENTS

3.1 HARDWARE REQUIREMENTS

3.1.1 FOR APPLICATION

4 GB RAM.

64 GB Free Space

3.1.2 FOR DEVELOPMENT

Intel Core i5

8GB RAM.

512 GB Free Space

3.2 SOFTWARE REQUIREMENTS

3.2.1 FOR APPLICATION

Android 11

3.2.2 FOR DEVELOPMENT

Any Operating System which could run Android Studio

Android-studio-2023.3.1.7-windows

CHAPTER 4. SOFTWARE REQUIREMENTS SPECIFICATION

4.1 USERS

4.1.1 Passenger

With this bus ticketing gadget, passengers get an unbroken experience from begin to complete. They can sign up with keywords, login effortlessly and manage their bills quickly. New bus passes are a breeze, finished absolutely on-line or via a smooth-to-use mobile app. This app additionally acts as their virtual ticket wallet, making it clean to get right of entry to their passports and tickets for verification. Should any questions get up, dedicated customer support is at once to be had for effective assistance. They usually offer passengers with the maximum updated records, making sure that they in no way leave out any critical updates or updates. With all of these functions running together, passengers can soar on board and navigate their journey with self-assurance.

4.1.2 Admin

In a virtual bus delivery system, admin users use a devoted portal to manipulate bus journeys and tickets. They approve or deny programs, generate and distribute QR codes, and technique fee facts. Administrators additionally keep person account facts, ensuring statistics security and gadget integrity. In addition, bus routes and schedules are up to date, notifications of any changes are sent, and bus popularity signals are provided in real time. This centralized manipulate improves efficiency and presents a clean experience for passengers and bus operators.

4.2 FUNCTIONAL REQUIREMENTS

4.2.1 User Registration:

Users start their digital bus pass adventure by means of registering on the application shape, offering the required data. This provider offers a unique account for every user, which acts as a primary point of reference for their bus tour related sports.

4.2.2 Creation of New Bus Pass and Bus Ticket:

Creating a bus skip or new price ticket is a smooth method to apply in the app. Users can effortlessly enter the vital statistics for brief registration, and the system responds with the aid of generating a unique QR code for brand new passports and tickets. This QR code is a virtual identity, allowing smooth get admission to bus offerings without the need for physical files.

4.2.3 Account Management:

A robust notification system is integrated into the app, keeping users informed about crucial updates. This includes notifications about pass expiration, renewal reminders, and other important announcements. The goal is to enhance user awareness and prompt timely actions to ensure a smooth bus pass experience.

4.2.4 Payment:

The app simplifies the bus journey and price ticket price technique thru digital charge methods. This guarantees a steady and convenient transaction revel in for customers, doing away with the want for bodily currencies or other charge interfaces.

4.2.5 Notification System:

The app is geared up with a sturdy notification machine that keeps users updated with different crucial facts. This consists of skip expiration statistics, renewal reminders, and other essential bulletins. The goal is to make certain a clean bus tour experience by means of growing consumer focus and stimulating timely actions.

4.2.6 Customer Support:

Recognizing the importance of customer support, the software includes dedicated functions to help customers. These aid structures can consist of frequently asked questions (FAQs), assist courses, or direct communication channels. By imparting reachable help, the app aims to reply users' questions and growth usual person pleasure.

4.3 NON-FUNCTIONAL REQUIREMENTS

4.3.1 Security:

Use sturdy encryption guidelines to defend user information and prevent unauthorized get entry to transmitted information. Use industry-main encryption algorithms to shield sensitive records throughout transmission and storage. Incorporate protection certification mechanisms together with multifactor authentication to beautify the overall safety of the digital bus delivery system. Conduct ordinary security audits and exams to identify and address potential vulnerabilities, and ensure protection in opposition to cyber threats.

4.3.2 Reliability:

Sophisticated QR code scanning and bypass verification structures can be used to make sure the reliability of digital bus bypass systems. Use fault-locating techniques to become aware of and accurate faults within the scanning process, reducing the possibilities of failure to make the most shipping gadget failure mechanisms and ability output machine screw ups to reduce redundancy operations, making sure continuity of use, and a dependable person enjoy.

4.3.3 Scalability:

Design systems with scalability in mind to deal with developing customers and behaviours. Use scalable architectures including cloud-based totally answers to supply dynamic content material based totally on call for. Use load balancing techniques to make sure that incoming site visitors is frivolously allotted across servers, removing overall performance bottlenecks. Conduct regular performance trying out to identify gadget boundaries and optimize useful resource allocation to preserve responsiveness, even during height utilization periods.

4.3.4 Usability:

Make positive you have got a user-friendly interface and a seamless enjoy to beautify the person revel in. Conduct usability checking out to acquire statistics about all navigation, configuration, and person interactions in the utility. Provide onboarding tutorials or help guides to assist users in understanding the functionalities of the application, promoting a positive and efficient user experience. Regularly gather user feedback for continuous improvement in usability.

CHAPTER 5. SYSTEM DESIGN

5.1 ARCHITECTURE DIAGRAM

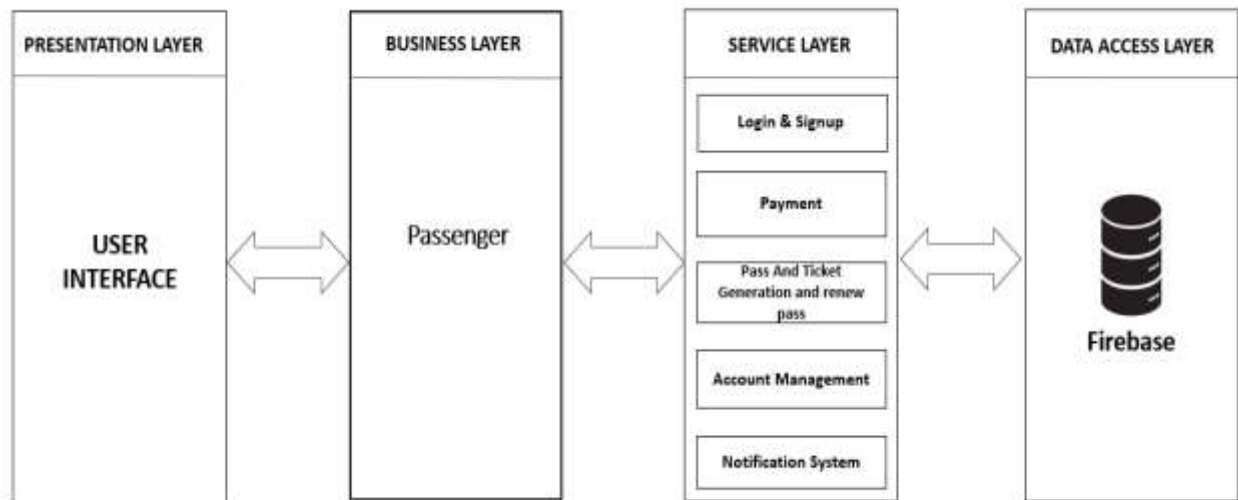


Fig 5.1 Architecture diagram

This architecture diagram indicates a virtual bus bypass system with separate layers for presentation, commercial enterprise, provider and information. The presentation layer has a person-pleasant interface, at the same time as the business layer handles admin and passenger offerings. The provider level includes login, charge, skip and price tag era, renewal, and account control. Firebase enables the statistics layer to enable information storage and management, with an included information machine in the course of.

5.2 CONTEXT DIAGRAM

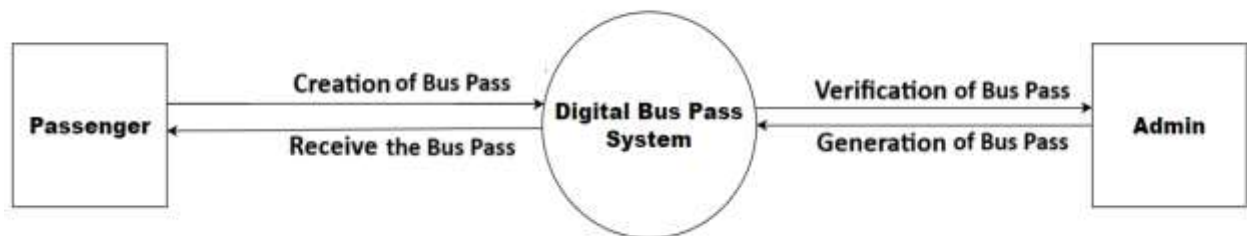


Fig 5.2 Context diagram

The reference diagram of the virtual bus skip gadget shows the interplay between passengers and the machine. The passenger can check in and generate bus passes and tickets with QR codes. The machine can song bus trips and price ticket programs, create bus journeys and tickets using QR codes, and check in new passengers. Bus passes and tickets use QR codes for clean verification and get admission to the bus.

CHAPTER 6. DETAILED DESIGN

6.1 CLASS DIAGRAM

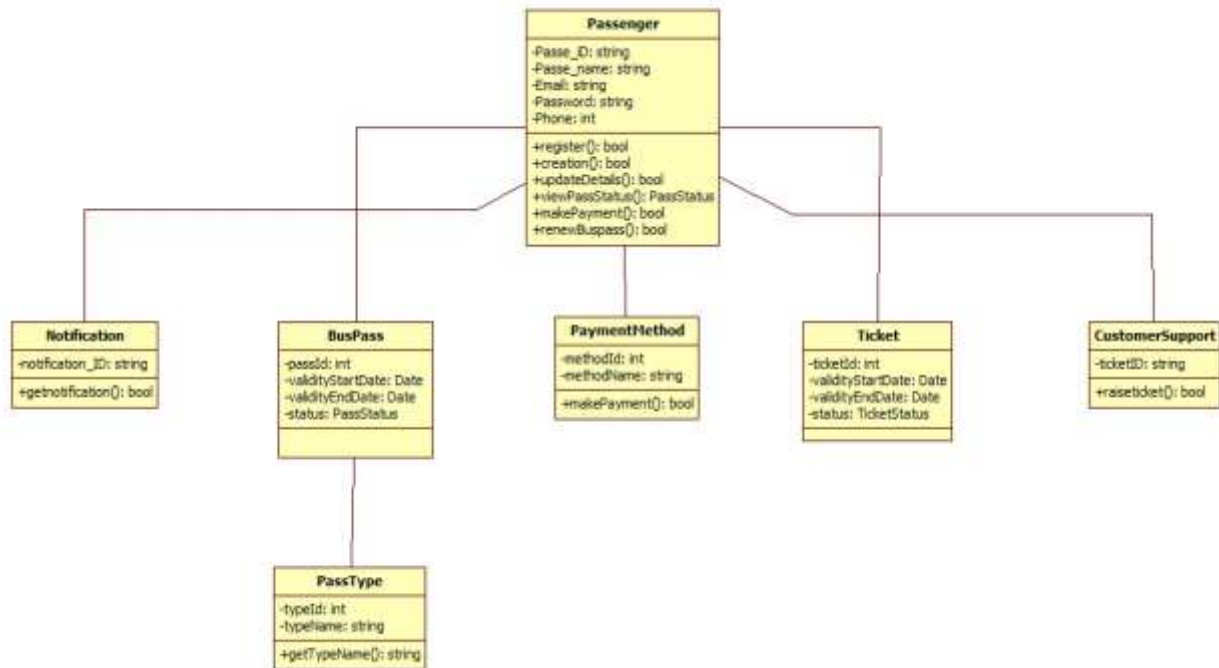


Fig 6.1 Class Diagram

The Digital Bus Pass System category photo includes sections related to User, Database, Bus Pass, Ticketing, Customer Service, and Payment. The User elegance consists of techniques for registering, logging in, and updating profiles. The database elegance incorporates strategies to access the database and execute queries. The Bus Pass path incorporates tactics for growing and developing new bus trips, in addition to bypass get right of entry to records. The Ticket class consists of techniques for growing and retrieving price ticket statistics. The Customer Service segment incorporates techniques for submitting and resolving customer service tickets. The Payment magnificence carries strategies for processing payments and receiving transaction data. This layout pattern follows loads of UML relationships which includes inheritance, joins, compositions, and institutions.

6.2 USE CASE DIAGRAM

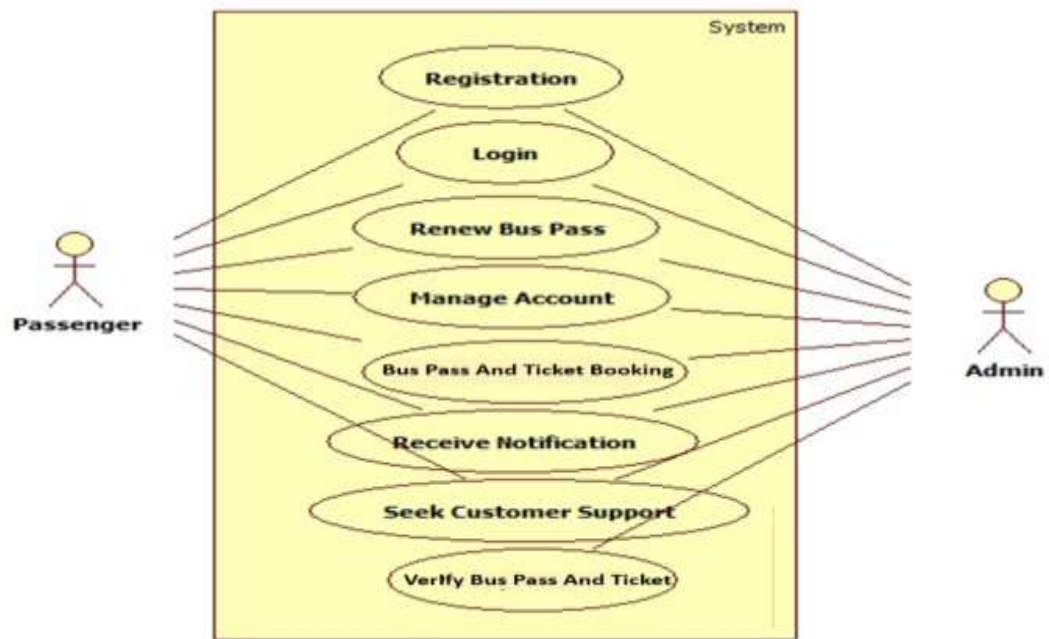


Fig 6.2 Use Case diagram

The digital bus transportation device is represented via a person diagram that consists of two humans: a passenger and a manager. The passenger can e-book bus passes and tickets, renew passes, control their account, sign up, login, get facts, contact customer support and confirm their passes and tickets. The administrator can manage the gadget, upload new users, expand bus trips, edit user bills, purchase tickets and trips, receive indicators, and verify trips and tickets. Interactions between actors and systems are described among them in this parent.

6.3 SEQUENCE DIAGRAM

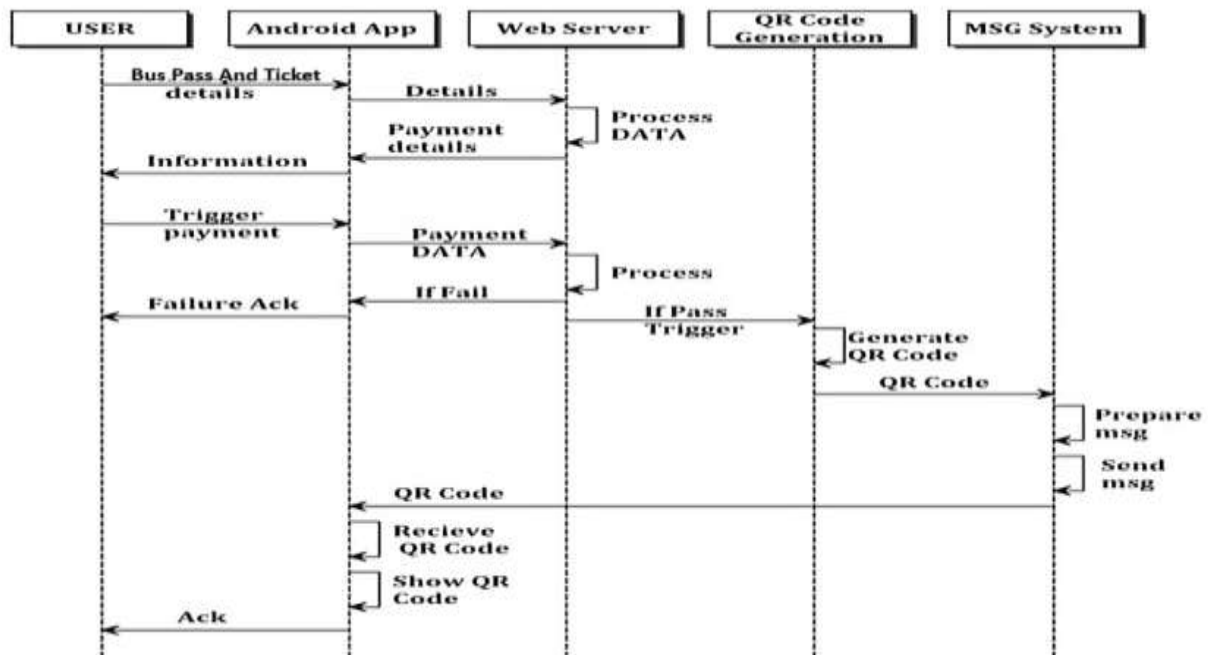


Fig 6.3 Sequence diagram

The Digital Bus Pass System sequence diagram shows the interactions between the user, Android app, web server, and message system. The user initiates the process by viewing bus pass and ticket details on the app, which then sends a request to the web server for payment details. If payment is successful, the web server generates a QR code and sends it back to the app for the user to display and receive their bus pass or ticket. If payment fails, the user is notified with a failure acknowledgement. The message system is also depicted in the diagram, which can generate a QR code and prepare a message to send to the user.

6.4 ER DIAGRAM

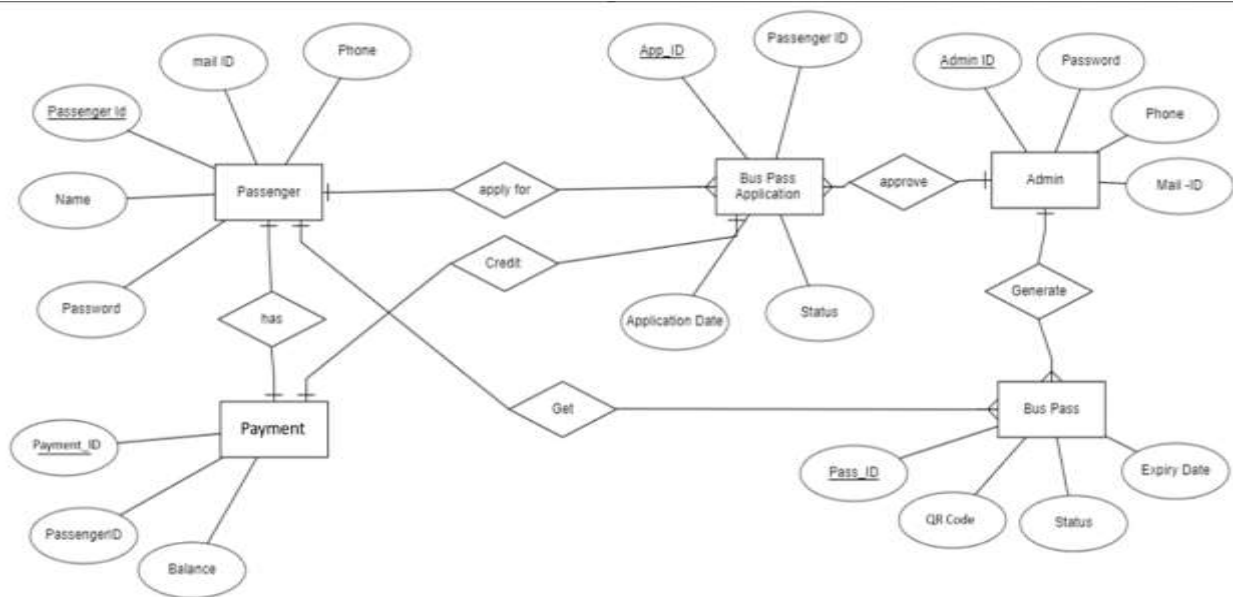


Fig 6.4 ER Diagram

This ER diagram represents a digital bus pass system with two main entities: Passenger and Admin. The Passenger entity has attributes such as Passenger ID, Name, Password, Payment ID, Email ID, Balance, and Phone Number. The Passenger entity is further divided into two parts: Passenger D and Passenger H, where Passenger D has Payment and Passenger H has Credit as attributes. The admin entity has attributes such as Admin ID and Password. The system also includes entities for Payment, Application, and Bus Pass. The Passenger can apply for a Bus Pass through the Application entity, which includes attributes like Application Date, Passenger ID, Status, Pass_ID, QR Code, Expiry Date, and Phone Number. The admin can approve or reject the application.

CHAPTER 7. IMPLEMENTATION

7.1 PSEUDO CODE

1. Pseudo code for Registration and Login

def register(name, email, password):

 open_registration_form()

 enter_name(name)

 enter_email(email)

 enter_password(password)

 confirm_registration()

def login(email, password):

 open_login_form()

 enter_email(email)

 enter_password(password)

 submit_login()

 print("Login successful!" if is_login_successful() else "Login failed. Please check your credentials.")

2. Pseudo code for Creation of New Bus Pass and Bus Ticket

Creation of Bus-Pass:

def buy_bus_pass(pass_type, validity_period):

 open_buy_pass_section()

 select_pass_type(pass_type)

```
select_validity(validity_period)

    proceed_to_payment()

        complete_payment()

    print("Bus pass purchased successfully!" if is_purchase_successful() else "Bus pass purchase
failed.")

DISPLAY "Bus pass created successfully"
```

Creation of Bus-Ticket:

```
def buy_bus_ticket(origin, destination, travel_date):

    open_buy_ticket_section()

    enter_origin(origin)

    enter_destination(destination)

    select_travel_date(travel_date)

    proceed_to_payment()

    complete_payment()

    print("Bus ticket purchased successfully!" if is_purchase_successful() else "Bus ticket
```

3. Pseudocode for Pass Renewal

```
def isPassExpired(expiry_date):

    today = datetime.date.today()

    expiry_date_obj = datetime.datetime.strptime(expiry_date, "%d/%m/%Y").date()

    return expiry_date_obj < today

def renewPass():

    print("Bus pass renewed successfully!")
```


4. Account Management

```
def changePassword():  
  
    open_profile_settings()  
  
        click_change_password_option()  
  
def editProfile():  
  
    open_profile_settings()  
  
        click_edit_profile_option()
```

5. Payment

```
def payWithUPI(amount):  
  
    enter_upi_id("__@okaxis")  
  
    enter_amount(amount)  
  
confirm_payment()
```

6. Help Desk

```
def accessHelpDesk():  
  
    open_help_desk()  
  
    if has_user_guide():  
  
        open_user_guide()  
  
    else:  
  
        select_category()  
  
        enter_message()  
  
    if has_submit_option():  
  
        submit_request()  
  
display_helpline_number()
```

7.2 SCREEN SHOTS

Digital Bus Pass System

Fig 7.1 Splash Screen

The initial screen that displays the branding of the bus pass and ticket booking application, providing a visually appealing introduction to the app.

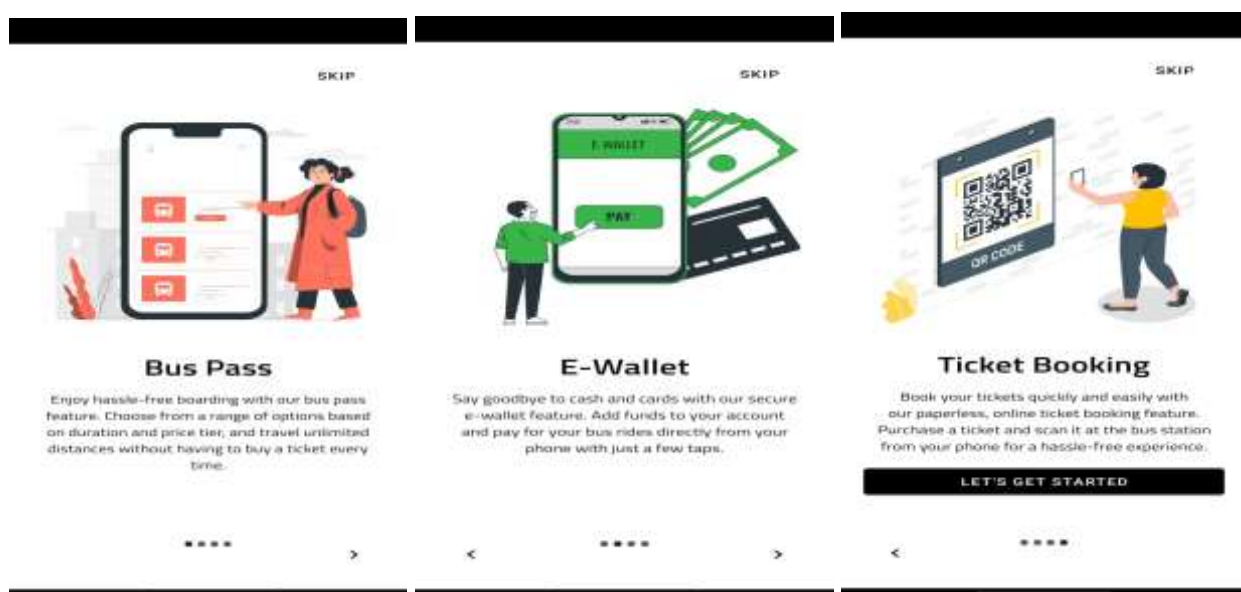


Fig 7.2 On Boarding Screen

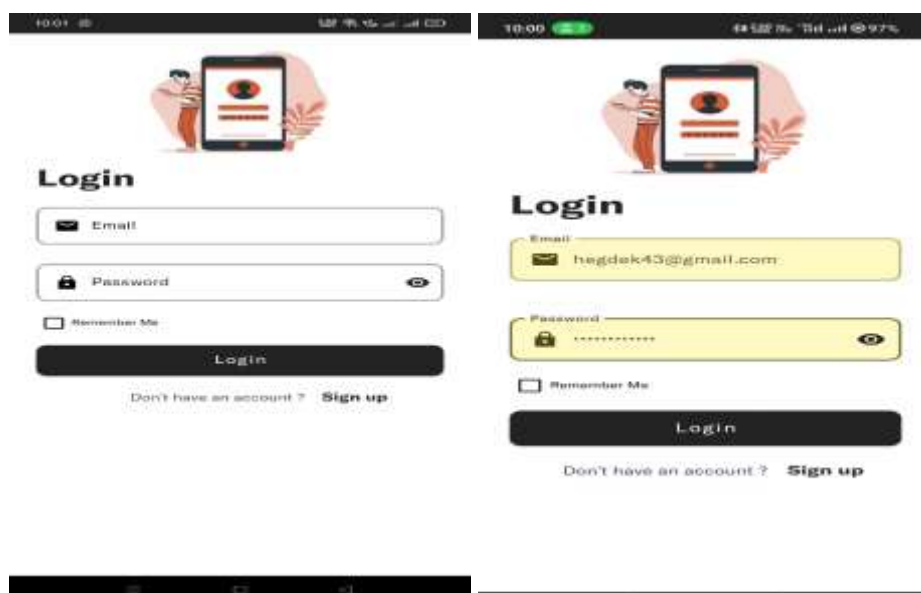
A screen that guides new users through the essential features and functionalities of the bus ticket booking application, helping them familiarize themselves with the app's functionality.



The registration screen features a title 'Register Here' at the top. Below it are five input fields: 'Name', 'Phone Number', 'Email', 'Password', and 'Confirm Password'. Each field has a corresponding icon (person, phone, envelope, and padlocks respectively). A 'Register' button is positioned below the fields. At the bottom, there is a link 'Already have an account? Log in'.

Fig 7.3 Registration

A screen where new users can create an account by providing their personal information, allowing them to access the full features of the bus ticket booking application.



The login screen features a title 'Login' at the top. Below it are two input fields: 'Email' and 'Password'. Each field has a corresponding icon (envelope and padlock respectively). A 'Remember Me' checkbox is located below the password field. A 'Login' button is positioned below the fields. At the bottom, there is a link 'Don't have an account? Sign up'.

Fig 7.4 Login

A screen where registered users can securely log into their accounts using their credentials, providing access to their personalized settings and ticket booking history.

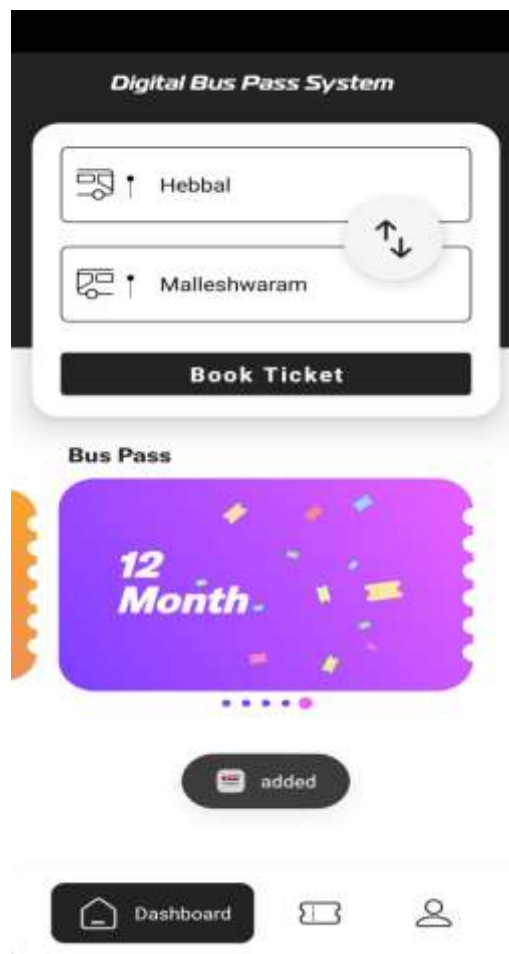


Fig 7.5 Dashboard

A centralized screen that serves as the home base for users, providing a comprehensive overview of relevant information such as bookings, and quick access to various app functionalities.

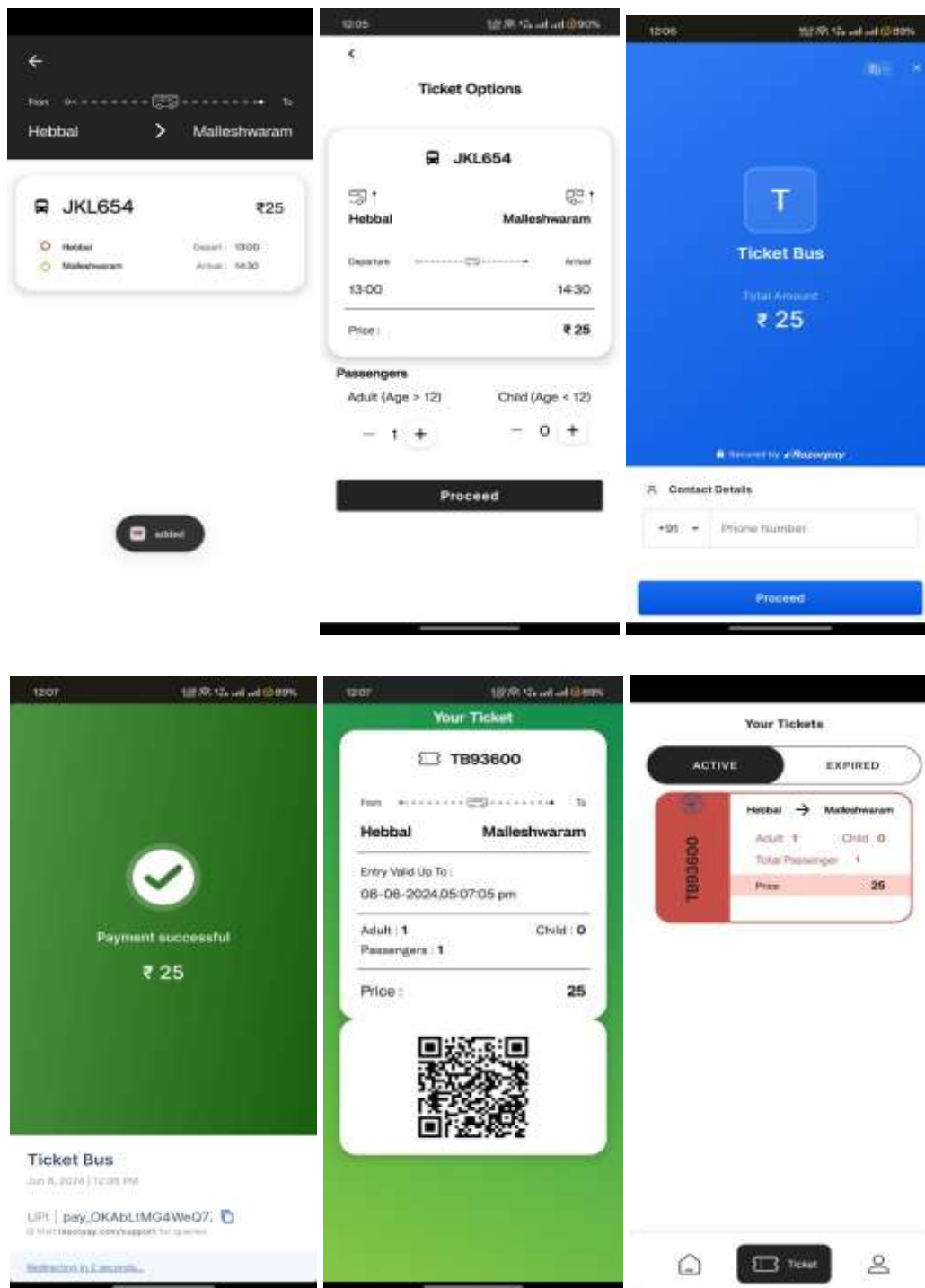


Fig 7.6 Ticket Booking

A display screen where customers can look for available bus routes and locations, and e-book their tickets, making sure an unbroken and uncomplicated booking technique.

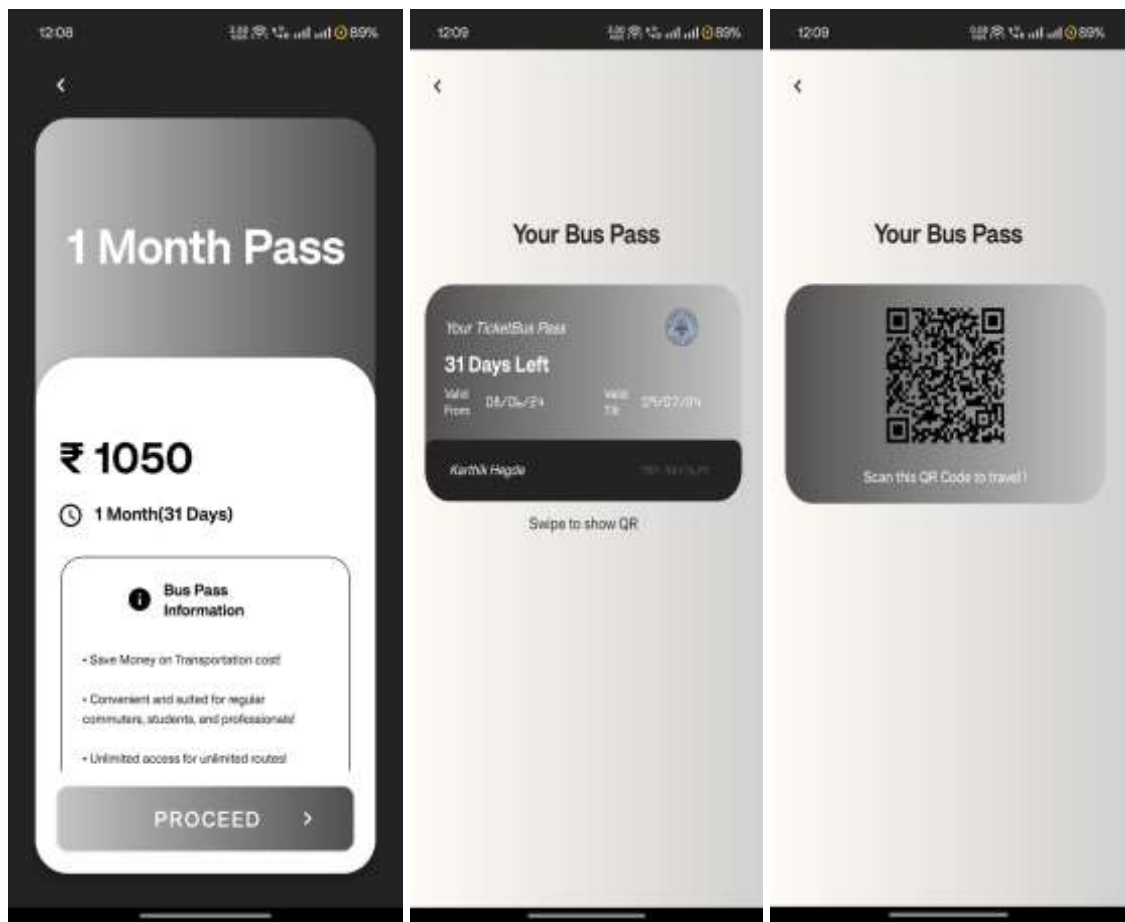


Fig 7.7 Bus Pass

A platform wherein users should purchase bus passes for everyday or frequent trips, offering a value-powerful and problem-loose mode of transportation.

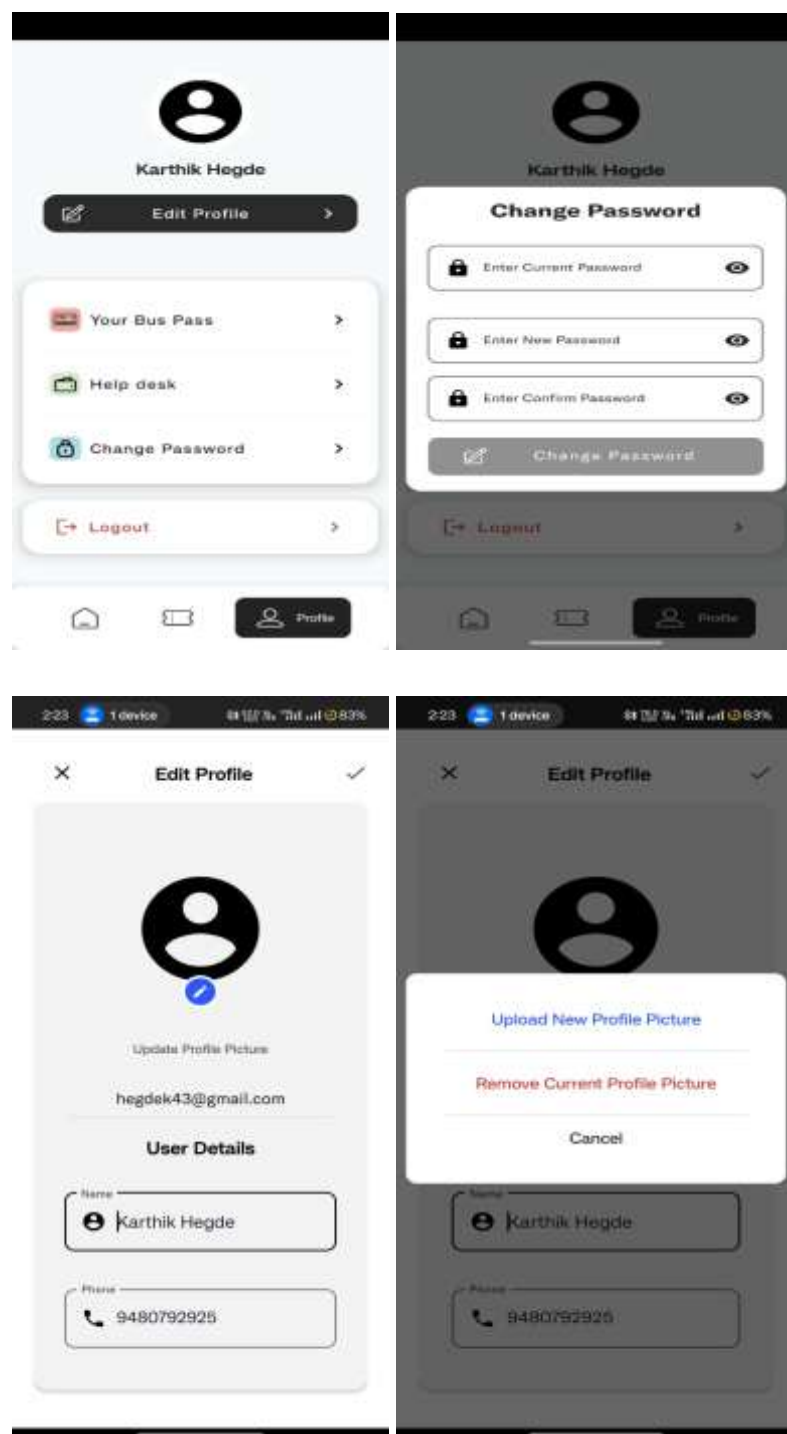


Fig 7.8 Profile

A display screen where users can view and replace their private profiles, manipulate their bus trips and e-wallets, making sure a customized and person-pleasant revel in.

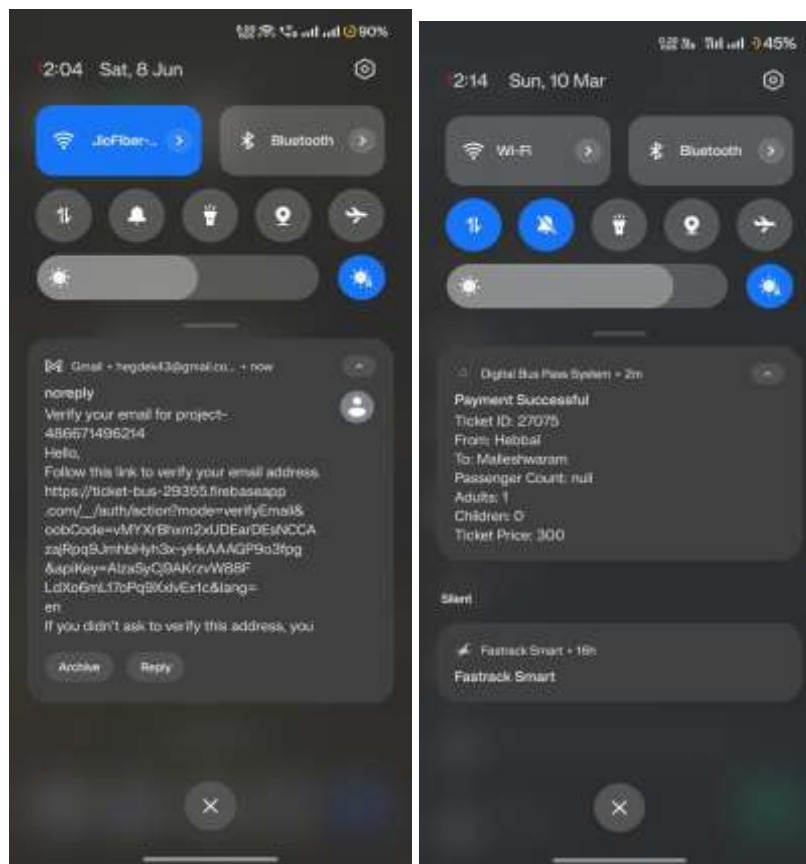


Fig 7.9 Notification System

This determine shows two mobile notifications. One is a confirmation e-mail after registration, and the opposite is a successful charge notification after buying a price ticket.

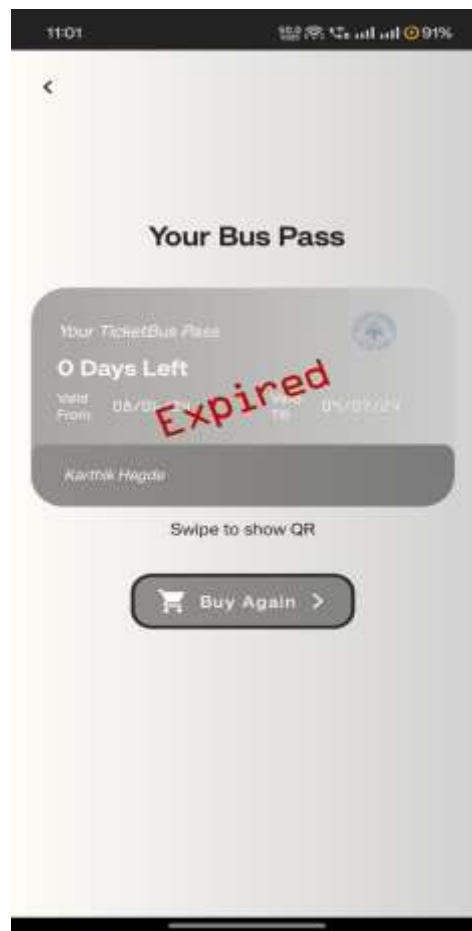


Fig 7.10 Pass Renewal

The image shows the cellular app screen with the bus pass. The bus pass has expired and the consumer is stimulated to purchase a brand-new skip. The button to purchase a new pass is categorized "Buy Again". The person can also swipe the screen to show a QR code. This means that the consumer can renew the bypass through the app.

CHAPTER 8. SOFTWARE TESTING

8.1 TEST CASES FOR DIGITAL BUS-PASS SYSTEM APP

Table 8.1 Registration and Login

Test Scenario	Registration and Login			
Test Scenario	Step Details	Expected results	Actual Results	Pass/Fail/ Non-Executed/ Suspended
TC01	Enter valid username, password, first-Name, last-Name, email, and phone	User registered successfully!	User registered successfully!	Pass
TC02	Enter empty username, password, first-Name, or last-Name	Username or Password or FirstName or LastName cannot be empty	Username or Password or FirstName or LastName cannot be empty	Pass

TC03	Enter valid username, password, first-Name, last-Name, and duplicate email	Email already present	Email already present	Pass
TC04	Enter registered email/username. Enter correct password. Tap "Login".	User successfully logs in and accesses the app's main screen.	User successfully logs in and accesses the app's main screen.	Pass
TC05	Enter unregistered email/username. Enter a random password. Tap "Login".	The app displays an error message indicating invalid credentials.	The app displays an error message indicating invalid credentials.	Pass

TC06	Navigate to the "Buy Pass" section. Select "Monthly Pass". Choose validity period (e.g., 31 days). Proceed to payment.	Error message should be displayed	Error message is displayed	Pass
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Table 8.2 Creation of Bus Pass and Bus Ticket

Test Scenario	Creation of Bus Pass and Bus Ticket			
Test Scenario	Step Details	Expected results	Actual Result	Pass/Fail/Non-Executed/Suspended
TC01	Navigate to the "Buy Pass" section. Select "Monthly Pass". Choose validity period (e.g., 31 days). Proceed to payment.	User successfully purchases a new monthly pass and sees it reflected in the app.	User successfully purchases a new monthly pass and sees it reflected in the app.	Pass

TC02	Navigate to the "Buy Pass" section. Select a pass with a higher price than available balance. Proceed to payment.	The app displays an error message indicating insufficient balance.	The app displays an error message indicating insufficient balance.	Pass
TC03	Search for desired route (Hebbal - Malleswaram) . Select travel date and time. Confirm purchase.	User successfully purchases a single ticket for the chosen route and date.	User successfully purchases a single ticket for the chosen route and date.	Pass

Table 8.3 Pass Renewal

Test Scenario	Pass Renewal			
Test Scenario	Step Details	Expected results	Actual Results	Pass/Fail/ Non-Executed /Suspended
TC01	Access the existing pass details. Check the expiry date (28). If expired, tap the "Buy Again" button. Complete the payment process.	User successfully renews the expired bus pass.	User successfully renews the expired bus pass.	Pass

TC02	Access the existing pass details. Check the expiry date (valid). Tap the "Buy Again" button (if available).	The app displays a message indicating the pass is already active or offers options for purchasing a new pass. Not possible to confirm	The app displays a message indicating the pass is already active or offers options for purchasing a new pass. Not possible to confirm	Pass
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Table 8.4 Account Management

Test Scenario	Account Management			
Test Scenario	Step Details	Expected results	Actual Results	Pass/Fail/Non-Executed/Suspended
TC01	Navigate to the "Profile" section. Tap "Edit Profile". Update user details (name, phone number, etc.). Save changes.	User successfully updates their profile information.	User successfully updates their profile information.	Pass

TC02	Navigate to the "Profile" section. Tap "Edit Profile". Enter invalid data (e.g., incorrect phone number format). Try to save changes.	The app displays an error message indicating invalid data.	The app displays an error message indicating invalid data.	Pass
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Table 8.5 Payment

Test Scenario	Payment			
Test Scenario	Step Details	Expected results	Actual Results	Pass/Fail/Non-Executed/Suspended
TC01	1. Select UPI as the payment method during purchase. 2. Enter the correct UPI ID. 3. Confirm the payment through the UPI app.	The payment is processed successfully, and the ticket/pass is purchased.	The payment is processed successfully, and the ticket/pass is purchased.	Pass

TC02	Select the UPI no Payment is the supply not People. Black from the purchase. Enter insufficient UPI ID stability. Try to emphasize the m rate.	The UPI app displays an error message indicating insufficient funds.	The UPI app displays an error message indicating insufficient funds.	Pass
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Table 8.6 Help Desk

Test Scenario	Help Desk			
Test Scenario	Step Details	Expected results	Actual Results	Pass/Fail/No n-Executed /Suspended
TC01	Navigate to the "Help Desk" section. Select the "FAQs".	The help desk is processed successfully,	The help desk is processed successfully.	Pass
TC02	Navigate to the "Help Desk" section. Look for a "Contact Us" section or helpline number.	The app does not display any contact information like a helpline number.	The app does not display any contact information like a helpline number.	Pass

CHAPTER 9. CONCLUSION

A virtual bus bypass device is a cutting-edge and effective method to the conventional bus skip system gadget, addressing a number of the shortcomings of manual structures. Using digital technology along with QR codes, the gadget enhances the person experience with clean registration, bus tour and ticket era, renewal processing. The app makes account management simpler and greater stable that well timed facts is nicely provided to customers. This reduces congestion, reduces paperwork, and increases data safety and restoration pace. The device additionally allows bus drivers to make sure they have got passed speedy and as it should be, improving efficiency.

CHAPTER 10. FUTURE ENHANCEMENT

Many destiny tendencies are planned to further enhance the digital bus shipping device to provide a greater comprehensive, smooth-to-use and efficient public delivery experience. These consist of an admin portal for handling and handling bus offerings in area, conductor portal for clean every day operation and bypass verification of the s Facilities together with common routes are stored and secured, simplified bus permit application procedure and buy of tickets at on line versions tailored to person wishes might be to be had. Enhancements which include stay bus monitoring, vicinity of the closest bus forestall, nearby bus stops, faraway reservation alternatives, and scholar-particular bus ticketing will enhance the system again. The expansion of carrier to unique cities will drastically boom the efficiency and accessibility of public delivery.

APPENDIX A

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<https://developer.android.com>

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Firebase Documentation - Firebase official Webpage - <https://firebase.google.com/>

Research Papers: Google, Semantic Scholar - <https://www.semanticscholar.org/>

Android development Tutorials – Neat Roots

Firebase Tutorials - The Tech Brothers

Books:


- Android Programming for Beginners – Second Edition by John Horton
- Android Studio 3.0 Development Essentials: Android 8 Edition by Neil Smyth
- Head First Android Development Second Edition by Dawn Griffiths

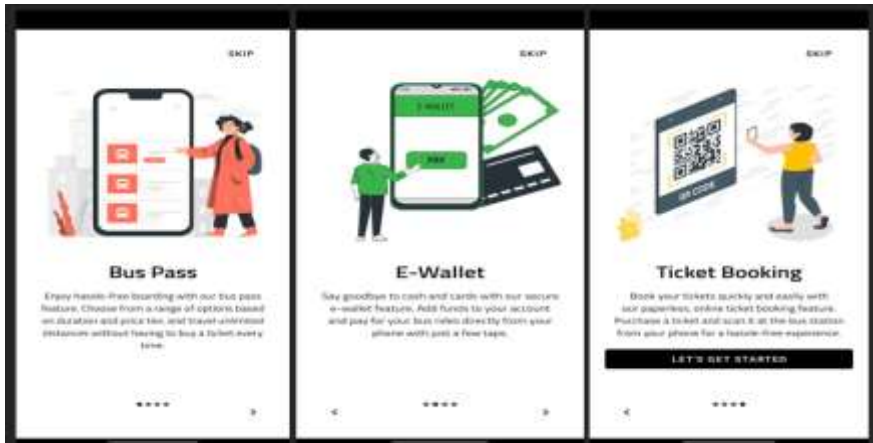
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USER MANUAL



1.	Navigate to Digital Bus-Pass System App in the mobile.
2.	Click on Digital Bus Pass System App.
3.	Then, it will Open. 



4.	Then, what are the functionalities are they're in the app will show in slide bar and click on last screen "Let's Get Started" button. 
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5.	<p>After, login page will open, their click on Sign up for new user.</p> 
6.	<p>In the registration page, fill-up all the details like Name, Phone Number, Email, Password, Confirm Password. Then, click on “Register” button.</p> 



7.	<p>After registration, you will get the confirmation mail for registered mail id which include on link, click on that link, then your mail got confirmed.</p> <div></div>
8.	<p>After, registration you will direct to again login page. Here, fill the details and click on “Login” button.</p> <div></div>



9.	<p>Then, you will direct to the home page of app. After, select the boarding and dropping point and then click on “Book Ticket”.</p> 
10.	<p>Then, it will redirect to page where select number of adult and child passenger. Then, click on proceed button.</p> 

11.	<p>Then it will redirect to payment gateway for payment of ticket. And, here enter the phone number and click on proceed button.</p> 
12.	<p>Then, it will redirect to page, their select payment method.</p> 

13.	<p>Click on the payment method and then click on pay now button. After, payment done, it will redirect to ticket with QR code generated.</p> 
14.	<p>In the home page below, there is a ticket section, click on that, which you can see the active and expired ticket.</p> 

15.	<p>Click on which bus pass you want like Daily, 1 Month, 3 Month, 6 Month, 1 Year pass.</p> 
16.	<p>Then, it will again confirm the pass which you have selected. Then, click on proceed button.</p> 

17.	<p>Then it will redirect to payment gateway for payment of ticket. And, here enter the phone number and click on proceed button.</p> 
18.	<p>Click on the payment method and then click on pay now button. After, payment done, it will redirect to bus-pass with QR code generated. Swipe the pass which will show QR code.</p> 

19.	<p>In the home page below, there is a profile section, click on that, which you can edit profile where you can edit name, phone number, edit profile photo. And also, there is a section called change password where you can change the password. In the end there is logout option. Click on the help desk, where there is manual of app and also there is a helpline number for any help needed.</p> 
20.	<p>If the pass expires, it will show pass expired and in the below buy again option. Click on that you can renew the existing bus pass easily.</p> 

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DIGITAL BUS-PASS SYSTEM



By: Karthik Ramesh Hegde (PES1PG22CA094), MCA Department, PES University
Project Guide : Ms.Sumitha Chandran, Assistant Professor, PES University

Abstract

- A user-friendly digital bus pass app allows easy registration, generating bus pass and bus tickets with unique QR codes for users upon sign-up and also users can easily renew that pass which was already existing after expiration of that pass.
- Bus conductors can efficiently verify passes via QR code scans, ensuring only valid passes are accepted.
- Users can manage their accounts, receive timely notifications, and access help desk for assistance, providing a seamless and convenient bus pass experience.

Hardware & Software Requirements


❖ Hardware Requirements:

- For Application: 4 GB RAM, 64 GB Free Space
- For Development: Intel Core i3, 8 GB RAM, 512 GB Free Space

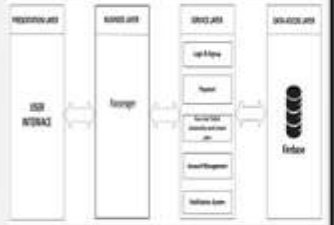
❖ Software Requirements:


- For Application: Android Lollipop 11
- For Development: Any Operating System that Can Run Android Studio, Android-studio-30.0.3.17-windows

Result



Architecture Diagram





Conclusions

↓

Paperless Booking
Digital Bus Pass System eliminates the need for physical tickets and pass by providing a seamless online booking experience, allowing passengers to travel easily.