Swiggy Genie Clone Application

Project report submitted in partial fulfilment of the requirement
for the degree of Bachelor of Technology

in

Computer Science and Engineering

By

Mangal Gupta(191291)

Under the supervision of

Dr Amit Kumar

to

Department of Computer Science & Engineering and Information Technology
Jaypee University of Information Technology Waknaghat,
Solan-173234, Himachal Pradesh

DECLARATION

I hereby declare that the work presented in this report entitled **Swiggy Genie Clone Application** in partial fulfilment of the requirements for the Award of the Degree of **Bachelor of Technology** in **Computer Science and Engineering** submitted in the Department of Computer Science & Engineering and Information Technology**,** Jaypee University of Information Technology Waknaghat is an authentic record of my work carried out over a period from July 2022 to May 2023 under the supervision of **Dr Amit Kumar (Assistant Professor(SG), CSE Dept.)**.

The matter embodied in the report has not been submitted for the award of any other degree or diploma.

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(Supervisor Signature)
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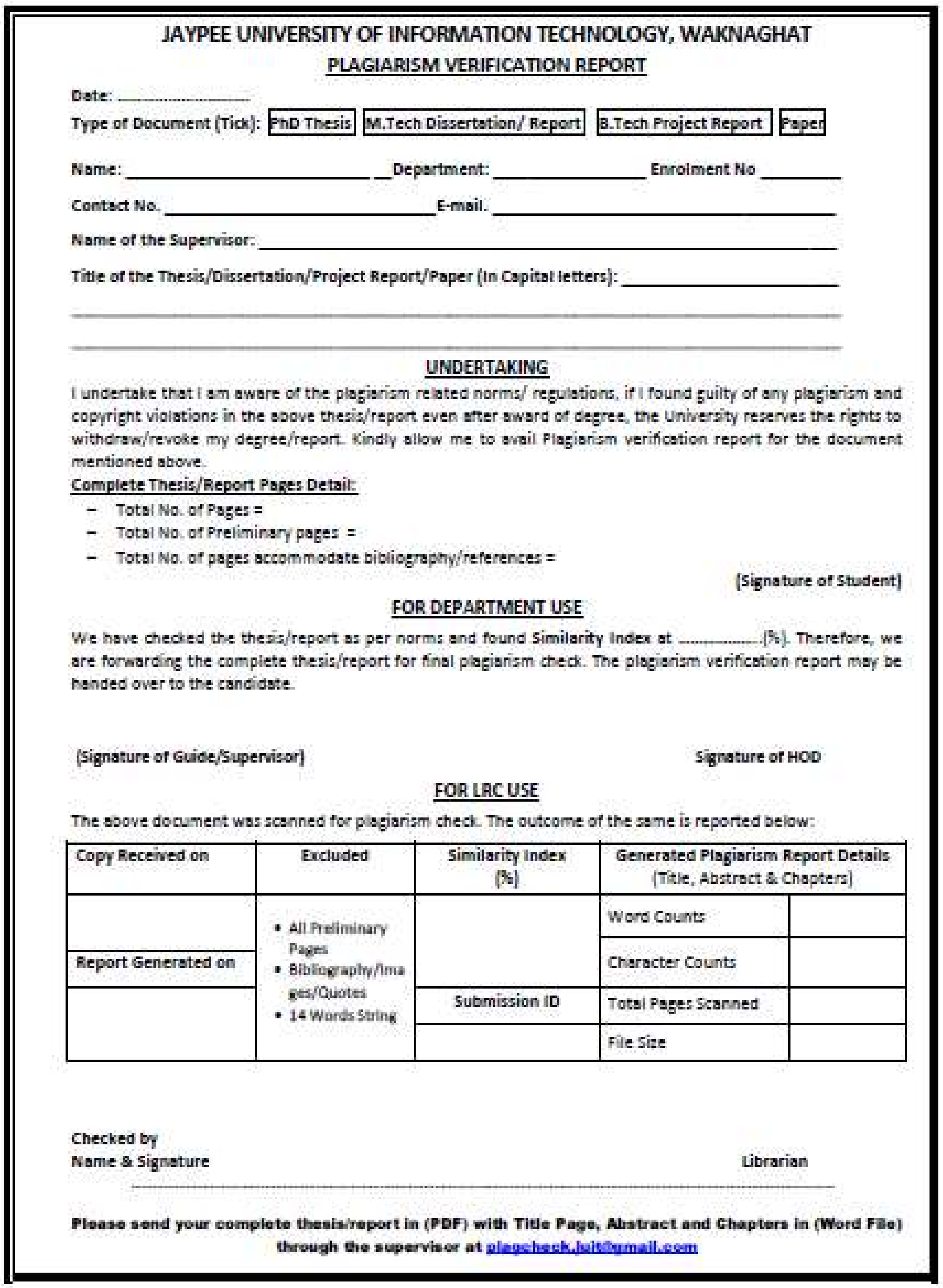

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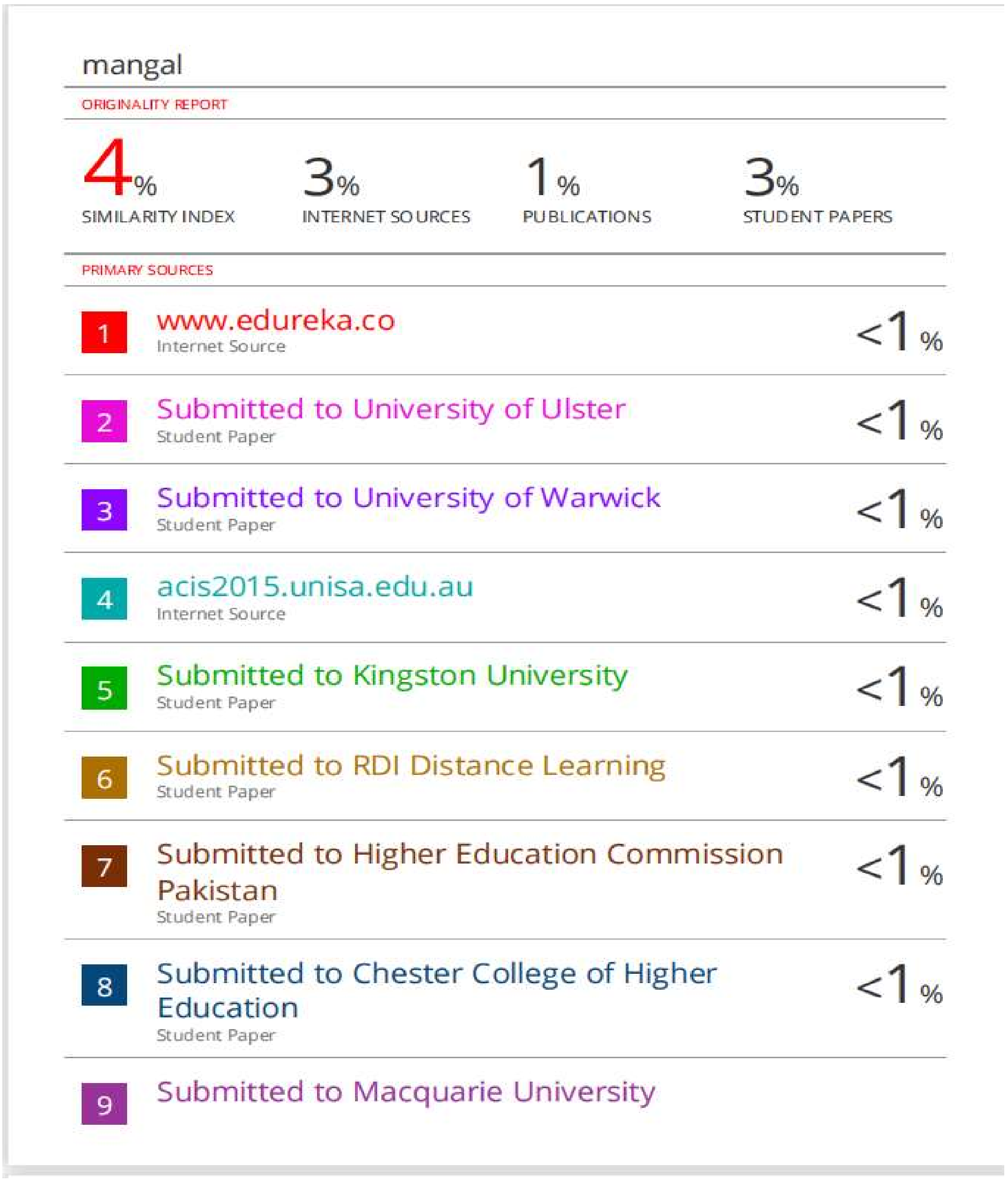

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I am grateful and wish my profound indebtedness to Supervisor **Dr Amit Kumar (Assistant Professor (SG)),** Department of CSE Jaypee University of Information Technology, Wakhnaghat. Deep Knowledge & keen interest of my supervisor in the field of "**Cross Platform App Development**" to carry out this project. His endless patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior drafts and correcting them at all stages have made it possible to complete this project.

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Mangal Gupta (191291)

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LIST OF ABBREVIATIONS

Abbreviations	Meaning
RN	React Native
API	Application Programming Interface
UI	User Interface
UX	User Experience
SDK	Software Development Kit
CRUD	Create, Read, Update, Delete
JS	JavaScript
HTML	Hypertext Markup Language
CSS	Cascading Style Sheets
IDE	Integrated Development Environment
OS	Operating System
VCS	Version Control System
NPM	Node Package Manager
RTDB	Firebase Realtime Database
HTTPS	Hypertext Transfer Protocol Secure
DNS	Domain Name System
HTTP	Hypertext Transfer Protocol
SSL	Secure Sockets Layer
JSON	JavaScript Object Notation,
TLS	Transport Layer Security

LIST OF FIGURES

ABSTRACT

Customers are seeking easy and fast ways to get food and other necessities, which has resulted in a significant increase in the meal delivery sector in recent years. A popular food delivery app in India called Swiggy has a special function called Genie that lets users purchase groceries and other necessities from nearby retailers and have them delivered right to their home.In this project, we used React Native, a well-liked framework for creating cross-platform mobile apps, to create a copy of Swiggy's Genie feature. Customers may order groceries and other necessities from neighbouring retailers using our Genie clone's user-friendly interface.

We have used a combination of React Native components, including the core components, navigation, and gesture handlers, to create a smooth and intuitive user interface for our Genie clone. Customers can easily browse through a list of available stores in their area, view product catalogs, and add items to their cart. Once the order is placed, customers can track their delivery in real-time, with notifications and updates provided at every step of the way.To manage orders, deliveries, and payments, we have also developed a backend system using Node.js and MongoDB. This backend system provides a scalable and robust solution for managing orders and deliveries, ensuring that our Genie clone is reliable and efficient.Overall, our Swiggy Genie clone developed using React Native offers customers a simple and convenient way to order groceries and other essentials from nearby stores, providing a seamless and hassle-free experience.

Chapter - 1
Introduction

1.1 Introduction

People are constantly on the go in today's fast-paced world, and the demand for delivery services has been rising quickly. The majority of delivery services, however, only accept certain goods, like food or parcels. In this project, we created a delivery service that can send anything according to the user's requirements.Our delivery service is adaptive and flexible, enabling consumers to order delivery of any product they require, including electronics, furniture, groceries, and prescription medications. With only a few taps on their phone, consumers can quickly and conveniently place delivery orders thanks to a mobile app we've created.Our delivery service is based on a strong backend platform that can manage several requests concurrently, guaranteeing that deliveries are done quickly and effectively. In order to give customers real-time tracking of their deliveries, along with updates on the delivery's progress and the anticipated time of arrival, we have also connected our delivery service with third-party APIs.

We have created a user-friendly website that enables consumers to monitor and control their delivery requests in addition to the delivery service. Users may conveniently update their account settings, examine delivery history, and keep track of the progress of their deliveries from one central spot.We have put in place a strict verification procedure for our delivery partners in order to guarantee the security and safety of the deliveries made to our users. Background checks are a requirement for our delivery partners, and they are taught to handle packages and other things with care.There are no geographic or geographic-based restrictions on our delivery service. To guarantee that we can offer our services to users from any place, we have formed relationships with delivery firms and couriers all throughout the nation. Our cloud-based technology, which enables seamless collaboration with our partners, has made this feasible.Our delivery service includes a feedback component that enables customers to score and comment on their delivery-related experiences. We utilise this input to tweak our offerings and make sure we're still providing what our customers want.With a user-friendly app and website, real-time tracking, and strict safety and security precautions, our delivery service offers consumers a versatile and adaptable solution for all of their delivery needs.

By offering a one-stop shop for all delivery requirements, our delivery service has the potential to completely transform the delivery sector.React Native is the technology we're utilising to build this application. React Native, a popular open-source framework for creating mobile applications, was created by Facebook [6]. It is based on React, a well-known JavaScript framework for generating user interfaces, and enables developers to construct native mobile applications for both the iOS and Android platforms using a single codebase. One of the main advantages of React Native is that it enables developers to use well-known web development languages like JavaScript, CSS, and HTML to produce high-quality, efficient mobile applications. It is therefore the ideal choice for web professionals who want to transition to developing mobile apps without having to learn another programming language or framework. It has been employed by companies like Facebook, Instagram, Airbnb, and Tesla to produce top-notch mobile applications. Cross-platform software production is the process of creating software that can be adapted to several types of hardware.

A cross-platform programme may run on Microsoft Windows, Linux, macOS, or any combination of these operating systems.A cross-platform application is one that works exactly the same on any type of device, such as an internet browser or Adobe Flash. React Native is also quite configurable, giving programmers the freedom to design distinctive user experiences that meet the needs of an organisation or project. This is made feasible by the adaptability of React Native's architecture and the simplicity of incorporating unique animations and effects.

1.2 Problem Statement

The necessity for a more flexible and adaptable delivery solution that can satisfy a variety of delivery requirements has been underlined by the rising demand for delivery services. Traditional delivery services have a defined distribution network and are only able to transport specific things and particular sorts of items, which limits their capacity to serve people in remote places.Additionally, the absence of real-time tracking systems and transparency frequently causes delays, missing or damaged products, and a generally bad delivery experience for customers. Additionally, customers now have serious concerns about the safety and security of products while they are in transit, especially given the growing number of delivery service providers.

The goal of this project is to provide a delivery service that can meet all of these requirements while offering users a flexible and adaptable solution for all of their delivery requirements. This involves having the capacity to supply anything according on the user's needs, from gadgets and furnishings to groceries and prescription medications. In order to guarantee prompt and effective delivery, the solution should also be based on a strong backend system that can manage several requests concurrently.

The ability to track deliveries in real-time and receive information on their progress and expected arrival time is another crucial component of the system. This will enable users to make the necessary scheduling adjustments and to rest easy knowing that their items are being delivered.Users also have serious worries about safety and security, thus the solution must have strict verification procedures for delivery partners to guarantee the protection of products while in transit. In order to enable consumers to offer feedback and assess their delivery experience and enable ongoing service quality improvements, the delivery service should also have a feedback tool.

Additionally, the solution must be flexible and adaptive in order to meet the demands of consumers in remote areas and offer delivery services for specialised goods. The suggested delivery service has the ability to revolutionise the delivery sector and offer a one-stop shop for all delivery requirements by solving these issues.React Native offers greater effectiveness and speed since it uses native components rather than web-based ones. As a result, React Native apps are quicker and more responsive, giving consumers a seamless experience. React Native is also very customizable, allowing developers to create unique user experiences that suit the requirements of their business or project. This is made possible by React Native's architecture's versatility and the ease with which custom transitions and effects may be added.

1.3 Objectives

Our application's goal is to offer a user-friendly interface. The programme should be easy to use, with straightforward directions and an intuitive user interface that guides users through the full delivery process. We set out to create an app that would provide a seamless hyperlocal delivery experience so that customers could send and receive goods quickly and simply. The following are the application's goals:

1. **To provide a delivery service that can deliver anything as per the needs of the user, from groceries and medicines to electronics and furniture.**

2. **To develop a mobile app that enables users to place delivery requests quickly and easily, with just a few taps on their phone.**

3. **To build a robust backend system that can handle multiple requests simultaneously, ensuring timely and efficient deliveries.**

4. **To integrate third-party APIs to provide users with real-time tracking of their delivery, including updates on the status of the delivery and the estimated time of arrival.**

5. **To develop a user-friendly website that allows users to view and manage their delivery requests, track the status of their deliveries, view delivery history, and manage their account settings, all from one convenient location.**

6. **To provide a feedback mechanism that allows users to rate and provide feedback on their delivery experience, enabling continuous improvements in service quality.**

7. **To ensure that the delivery service is flexible and adaptable, catering to the needs of users in remote locations and providing delivery services for specialized items.**

8. **To provide an affordable and cost-effective delivery service that is accessible to all users, regardless of their location or delivery requirements.**

By accomplishing these goals, the suggested delivery service will offer a versatile and adaptable solution for all delivery requirements, with a user-friendly app and website, real-time tracking, and strict safety and security precautions. The delivery service might revolutionise the delivery sector and establish itself as a one-stop shop for all delivery requirements.

1.4 Methodology

We will go over the project's process step by step in this part. React Native was utilised as the framework for the front-end mobile application in this application. Expo Go and React Native CLI are two separate methods for creating and deploying React Native apps. Expo Go and React Native CLI are two separate methods for creating and deploying React Native apps.

- **Research :** Do a thorough analysis of the delivery industry's newest developments and technology, as well as the limits of current services. Consider consumer preferences and demands, such as delivery location, product size, speed, and cost.
- **Conceptualization :** Create a delivery service idea based on research findings that may overcome the shortcomings of current services and accommodate client wants and preferences.
- **Development :** Create a mobile app and website for the delivery business that includes tools for managing delivery requests, monitoring packages in real time, and providing feedback.Create a strong backend system that can manage several requests concurrently and guarantee prompt and effective delivery.
- **Integration :** Integrate third-party APIs to offer delivery monitoring in real-time, along with updates on the delivery's progress and an expected arrival time. Form alliances with nationwide courier and delivery businesses to guarantee that consumers may access the delivery service from any place.

- **Verification :** To protect the security and safety of users' packages while they are in transit, implement a strict verification procedure for delivery partners. This entails confirming the legitimacy of delivery partners' backgrounds and identities as well as keeping an eye on their output.
- **Launch :** Launch the delivery business and engage in a focused advertising effort to draw customers. Keep an eye on how the service is doing and make the required adjustments in response to customer input.
- **Continuous Improvement :** Continually enhance the service in light of customer feedback, technological developments, and new delivery industry trends. This entails enhancing the functionality of the website and app, growing the distribution system, and putting additional safety and security measures in place.

By following this methodology, the proposed delivery service will be developed and launched successfully, with a focus on meeting the needs and preferences of users, ensuring timely and efficient deliveries, and providing a safe and secure delivery experience. Continuous improvement will enable the delivery service to stay ahead of the competition and become a preferred choice for users.

Table 1.1 shows the technologies stacked for implementation of the application.

React Native	Front-end framework
Node.js	Back-end
Express.js	API
Stripe	Payment gateway
Firebase	Back-end authentication

Table 1.1 List of technologies stacked for application

The following stage is to stack all the technological requirements after designing the user interface of our programme and determining the demands of the users. Next is the decision on the technical stacking. React Native is the primary development tool used to build the mobile application for users of Android and iOS. Others that might be used include Node.js for API access and Firebase for backend services. A variety of tools and applications are available for developing and delivering apps for the web and mobile devices using Google's cloud-based Firebase platform.

Firebase offers a wide range of backend features that help programmers build apps more quickly and effectively. Google's Firebase offers a wide range of services, including authentication,Cloud messaging Programmers may deliver alerts to users over many platforms, such as iOS and Android, and the web, using real-time cloud communication. After choosing the technologies the user is then moved to the most important step of developing the code. The application's code is written during the development stage. Fig 1.1 shows. This involves building the application's front- end and back-end, integrating APIs, and testing it for faults and other problems. The application is tested throughout the testing and quality management stage to ensure it satisfies its functionality and operational criteria. Testing for units, validation of integration, and user acceptability testing are all included in this. Following recommendations, documenting all of the efforts made, and making sure the source code is adaptable and manageable to accommodate subsequent upgrades and improvements are crucial through the whole process.

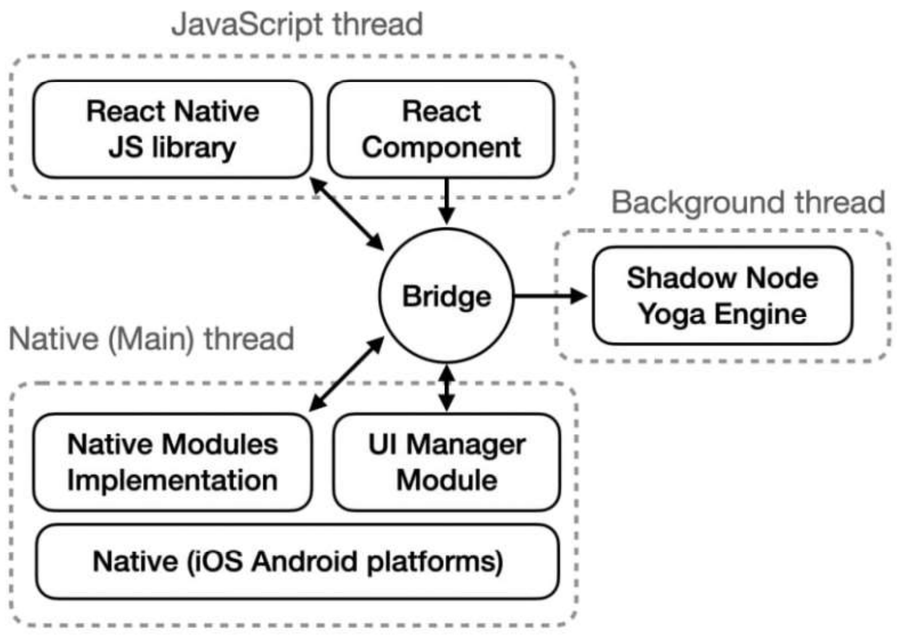


Fig 1.1 The React-Native Architecture.

Over the years the React Native is continuously trending in comparison with other technologies as shown in Fig 1.2. The most popular technology giving tough competition to React native is Flutter but due to some disadvantages of flutter and some extra features of React Native makes it more reliable, adaptive and flexible to use. Components, hooks, component's life cycle are some of the key features of React native which makes our development faster.Apps created for both the Operating System

Chapter-2
Literature Survey

This portion of the study will detail the literature review we conducted to examine the body of knowledge already available on React native applications. Mobile apps are developed for both iOS and Android-based devices using the well-liked cross-platform programming framework React Native. It is well known for its ease of use, effectiveness, and versatility. Product delivery is one of the most frequent use cases for mobile applications, and it is growing in popularity quickly. The React Native application for product delivery is the main topic of this assessment of the status of the literature. The aforementioned review was carried out by searching many academic databases, including Google Scholar, IEEE Xplore, and the ACM Digital Library.In one study, Atul et al. (2021) looked at the development of a React Native application for product distribution. The paper claims that using React Native can reduce development time by up to 30% when compared to developing separate iOS and Android applications. The programme could handle several requests at once and provided real-time tracking of the status of the package. Another research by Singh et al. (2020) focused on the user experience of a products distribution application built with React Native. The application's user-friendly design, which the research found to be clear and easy to use, allowed users to execute delivery orders swiftly and efficiently.

P. Singh and colleagues' "Building Mobile Applications using React Native: A Study of Performance and User Experience" (2020). In this study, the effectiveness and user satisfaction of a React Native-built mobile application are examined.React Native is a powerful framework for creating mobile applications since it offers outstanding performance and user experience, claims the paper. S. Arndt et al.'s "Cross-Platform Mobile Development with React Native: A Case Study" (2020). This article examines a React Native-built, cross-platform smartphone application as a case study. The study highlights React Native's advantages for building cross-platform applications and provides insight into the design process.S. Lee et al.'s "Development of a React Native-based Mobile Application for Online Grocery Shopping" was published in 2020. This article discusses the development of a React Native-based smartphone application for online grocery shopping. The study focuses on the design process and highlights the benefits of using React Native while developing e-commerce applications. S. Hasan et al.'s 2019 study "A Comparative Study of React Native and Native Mobile Application Development" The performance, user experience, and design of React Native are compared to those of developing native mobile applications. The paper claims that React Native offers several advantages, including quicker development and better user interfaces. These academic publications provide relevant information on the development of React Native apps as well as advantages of using React Native for building cross-platform mobile applications."Development of a React Native-based Mobile Application for Online Grocery Shopping" by S. Lee et al. (2020). This piece examines the creation of a smartphone application for purchasing groceries online that is built on React Native. The research focuses insight into the design process and emphasises the advantages of utilising React Native while creating applications for e-commerce. "A Comparative Study of React Native and Native Mobile Application Development" by S. Hasan et al. (2019). The paper contrasts the creation of native mobile applications to React Native in terms of performance, user experience, and design. According to the report, React Native has a number of benefits, such as more rapid development and improved user interfaces.

Chapter - 3
System Development

3.1 Analysis

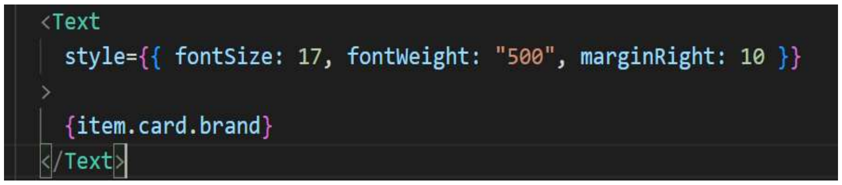
In this stage we gather and analyse, recognise, collect and evaluate the specifications and functionality for the application. Finding the application's key components, such as registration of new users in our application, signing-in the registered user, locating the current users pick-up point and delivery point, calculating the cost associated with the delivery, payment processing, and delivery tracking, is necessary for this.

Based on these requirements we made a system design that covers the structure, interface for users, and database structure based on the specifications. Make a design paper that specifies the system's technical specifications. We need to create the system with the aid of essential platforms and technologies, including React Native and Firebase (for backend services). Design the user interfaces, combine the back-end services, and put the system logic into practice. After implementation we have to run tests on our application. The platform's construction utilising React Native, Firebase, and other pertinent resources and structures is the main emphasis of the implementation phase. React Native components are used in the creation of the user interface, while CSS is used for styling. Firebase is used to create the backend services and offers features like cloud computing, database storage, and authentication. Programming languages like JavaScript or TypeScript are used to carry out the system logic. React Native apps may simply be connected with Firebase, a user-friendly platform. It provides pre-built frameworks and extensions that make using its services straightforward, along with thorough instructions and support to help developers get going right away. Due to Firebase's tremendous adaptability and scalability, it can efficiently manage enormous volumes of data and traffic. It also offers real-time updates, which makes it perfect for applications that call for multiuser collaboration or real-time synchronisation. Developers can track and enhance the performance of their React Native applications with the help of Firebase Analytics and Test Lab, which provide them strong analytics and testing capabilities. For storing and retrieving enormous volumes of data, including music, video, and image files, Firebase also provides cloud storage services.

3.2 Design

This phase involves designing a technological strategy for the item's delivery application as part of the design process. This comprises the database schema, user interface, and architecture. The system's backend services, APIs (Application Programming Interface), and user interface components are all described in the structure of the system plan along with how they interact. To assure accessibility and ease of use, the user interface layout should adhere to best practices and guidelines for design. The data model, relationships between entities, and data storage techniques should all be specified in the database architecture.
A style tool called "StyleSheet" that mixes JavaScript and CSS-like syntax is utilised in React Native. Using a StyleSheet is a simple and efficient way to define style for React Native parts.

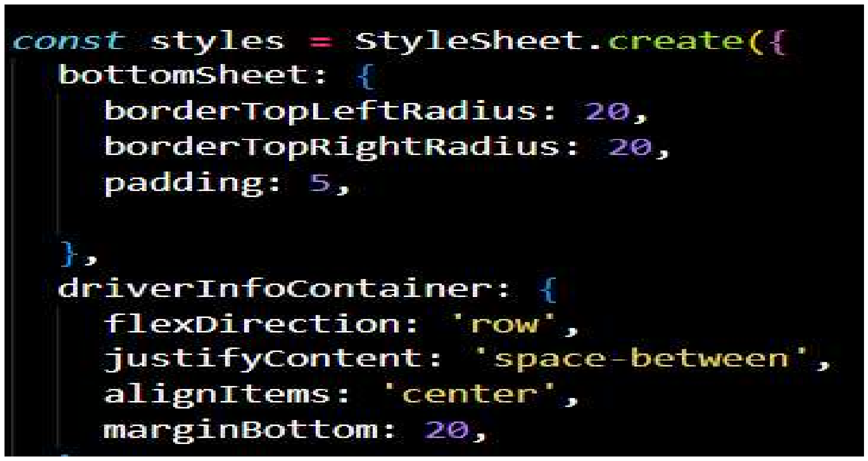
Inline styling: React Native components can have inline styling added to them in a manner similar to how styles are applied to specific HTML elements. For example, you may specify the component's colour, text size, and other details precisely. As seen in Fig. 3.1



```
<Text
  style={{ fontSize: 17, fontWeight: "500", marginRight: 10 }}
>
  {item.card.brand}
</Text>
```

Fig 3.1 Inline styling

- **StyleSheet.create()** : You may use the StyleSheet.create() to generate more intricate styles and reuse them across many components. The above function accepts an object as an input, where the style objects are represented by the values and the style names are the keys.

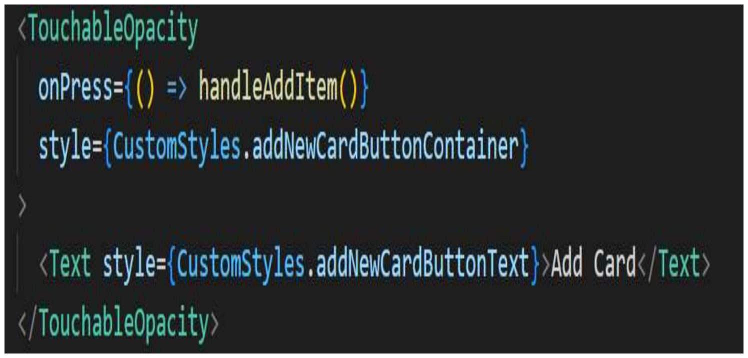


```
const styles = StyleSheet.create({
  bottomSheet: {
    borderTopLeftRadius: 20,
    borderTopRightRadius: 20,
    padding: 5,

  },
  driverInfoContainer: {
    flexDirection: 'row',
    justifyContent: 'space-between',
    alignItems: 'center',
    marginBottom: 20,
```

Fig. 3.2 styling using create function

- **Using styles in components :** After defining the aesthetics using StyleSheet.create, one can use the style prop to add them on to React Native components. The code for this is shown in Fig. 3.3



```
<TouchableOpacity
  onPress={() => handleAddItem()}
  style={CustomStyles.addNewCardButtonContainer}
>
  <Text style={CustomStyles.addNewCardButtonText}>Add Card</Text>
</TouchableOpacity>
```

Fig. 3.3 Styling using style components.

Designing of the project is distributed into certain levels. These levels are :

- Authentication
- Product and location selection

- Payment

Fig 3.4 represents the ER model of user authentication. If the user is new to this application he needs to sign up and if an individual is already registered then he has to simply sign in. In both the cases the user can only validate himself with the mobile number [3]. The user gets an OTP on their registered mobile number.

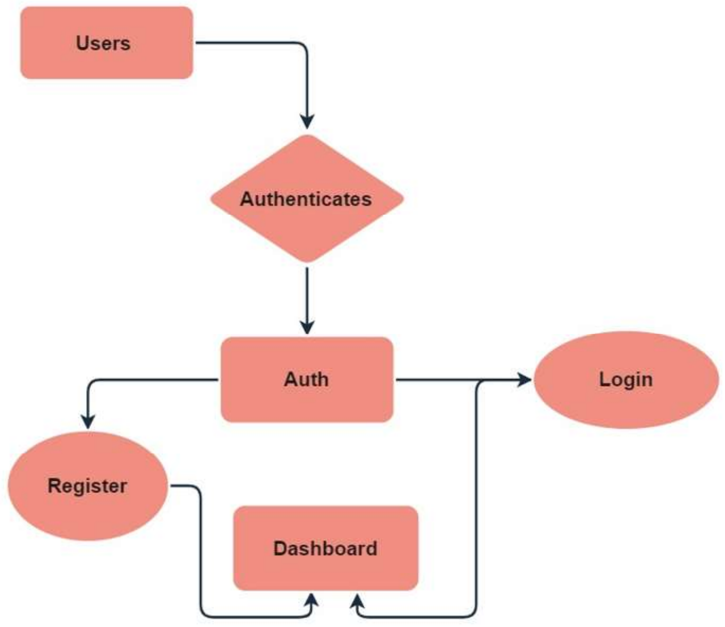


Fig. 3.4 ER diagram of user authentication

Product and Location Selection

After logging in, the user will be able to choose the pickup and drop-off locations for the product delivery as they progress through the programme. The following information must be filled out by the user in this module of our application:

- Pick-up location
- Destination
- Details of the items which is to be delivered
- Some instructions for the delivery partner to deliver the product.

Fig 3.5 shows the flow of this process, first the user will select the pick-up point, as he clicks on this option a map will be displayed to select a location. For this map, I have used MapBox and MapView which are components of react native. This same step is followed in selecting a destination location. Then the user has to add the items he wants to be delivered. Users can also add some instructions for the delivery partner to deliver the items. It is a guideline for the delivery boy on how he should be reaching his destination.

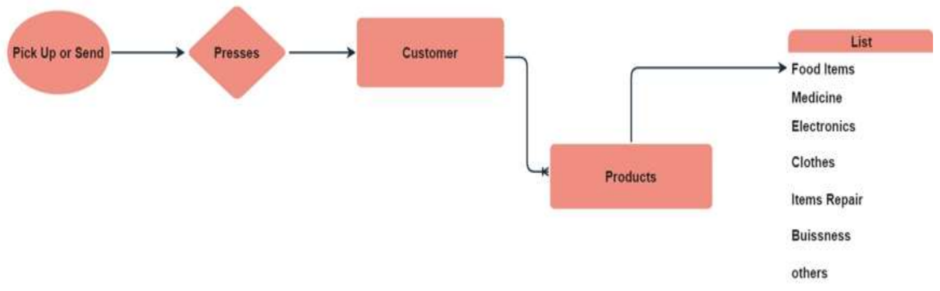


Fig. 3.5 ER diagram of product and location selection feature.

The MapBox tool will discover the best and quickest path to the destination when we enter the source and destination locations, and it will also provide us with the distance between the two spots. The cost of delivery is solely dependent on this distance. The user will receive a complete delivery invoice as soon as the source and destination locations are verified, along with a payment page. The payment ER diagram is displayed in Fig. 3.6. The capability to add a new card for payment is available to the user.

The user will select the card from which he wants to make a payment each time. If the user wishes to add a new card, a dialogue box will open in the centre of the screen, requiring him to enter the card's information. The front-end properly verifies if the card information is accurate or not. On the backend, Stripe is used to check if the card details match those of an existent card or not. We'll talk more about this technology in the next section of this chapter.

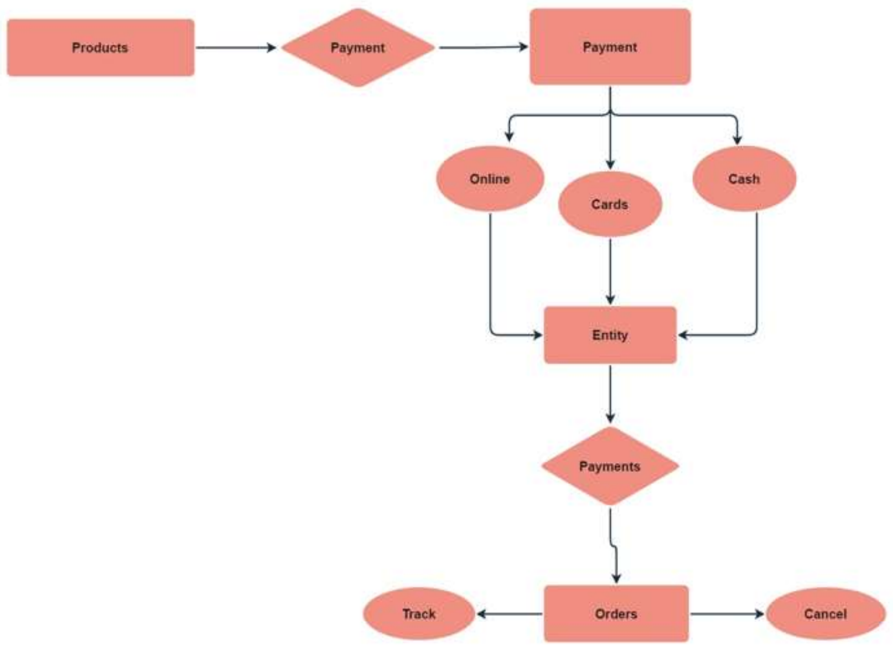


Fig 3.6 Showing the flow of payment methods

The user of this application will also get a number of features like, to see and edit profile, give rating and reviews to the delivery partner, order history and notification. As soon as the item reaches its destination, the user will get a notification about the delivery. The user is then able to rate the driver based on its behaviour and delivery timing and the user can also be able to write some reviews about the delivery partner. The user can also be able to see all the reviews and rating he has ever given to the delivery partner.

The user will always be logged in as the prior user or the last user when he launches the programme. The application's logout option will return users to the application's home page, where they may sign in again using a different mobile number or register a new user. In order to get an OTP on the specified mobile number, the user's entered mobile number must be operational.

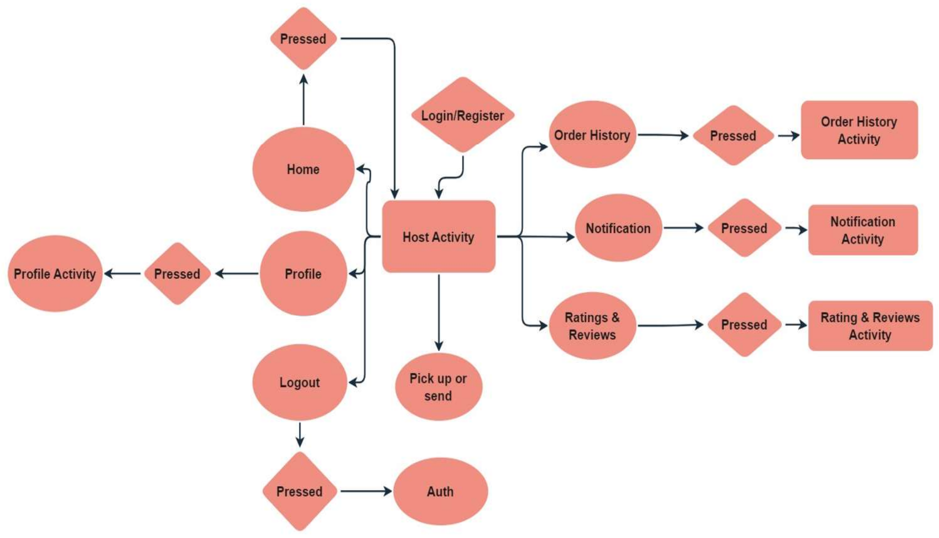


Fig 3.7 ER diagram of application

3.3 Development

This part focuses on a full overview of how our application was built. The construction phase of a report on a React Native application also includes the technologies and tools I utilised, as well as the difficulties I ran across. This offers comprehensive details on the technology employed in this project.

- Expo
- Android Studio
- React Native

- Node.js
- Express.js
- Firebase
- Stripe

Android Studio

Android apps are developed using Android Studio, an Integrated Development Environment (IDE). A popular framework for creating cross-platform mobile apps, React Native, is also compatible with Android Studio. The IDE has a number of functions and tools that improve the effectiveness of the design and development process. The React Native framework enables developers to build native mobile apps for both iOS and Android platforms from a single source code base [1, 2].A powerful development environment is offered by Android Studio for creating React Native apps. For testing and evaluating campaigns on multiple hardware and operating systems, it has an integrated Android emulator. Additionally, it provides assistance with React Native programming via an extension dubbed "React Native Tools." Support for features like code highlighting and autocompletion, creating and running React Native projects, and creating, testing, and debugging React Native apps are all provided by this plugin.

A built-in Android emulator, dynamic refreshing to view code changes without recompiling, code autocompletion and syntax highlighting for React Native elements and APIs, tools for analysing app performance, and tools to

optimise native Android components for use in React Native apps are just a few of the features of Android Studio for React Native.Additionally, Android Studio offers a comfortable development environment for Android developers with a broad range of capabilities and resources for building apps, integration with Git and other version management systems for efficient native Android module integration, and debugging resources for finding and fixing bugs in React Native programmes.In conclusion, Android Studio is a well-liked option for developing React Native apps because of its strong features and simplicity of use. It offers developers a reliable and effective IDE for building high-quality mobile applications that function across platforms.

ExpoGo

Expo is a robust tool set that has grown in popularity among developers for creating and distributing React Native apps. By reducing a lot of the complexity and framework-specific constraints related to developing and delivering apps for mobile devices, it streamlines the development process. Expo frees developers from worrying about infrastructure support so they can concentrate on developing intriguing and great apps. Expo's capacity to allow software development across platforms is one of its main features. Expo removes the differences between the Android and iOS operating systems, enabling programmers to create applications that function well on both platforms. This is done by utilising a standardised API to access device functions like the camera, push notifications, and connections.
A popular tool for creating and delivering React Native applications is called Expo. Its main benefit is that it makes the development process simpler, enabling designers to produce outstanding apps without worrying about infrastructure support.

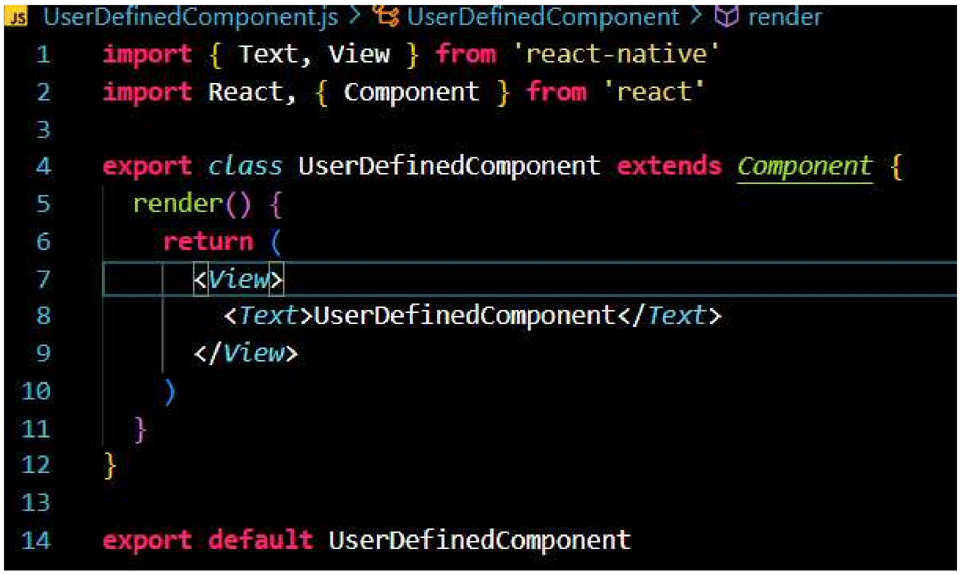
Expo's capability to facilitate cross-platform development is one of its outstanding characteristics. Programmers may design apps that function well on both Android and iOS by utilising a consistent API to access device capabilities. With pre-built UI components and APIs to access device functions like the camera and push notifications, Expo also provides a user-friendly setup procedure.To use Expo, we first need to comprehend React Native, a technology made available by Facebook in 2015. The backbone of React Native is Reactjs, which is renowned for its declarative programming approach. React manages the how by letting developers specify what they want to happen, which makes building and maintaining algorithms easier. The capacity of React to manage enormous volumes of data and instantly refresh the user interface without reloading the page is another feature that has earned it recognition. React is quick because it renders components quickly using virtual DOM, and developers may design reusable parts using either class-based or function-based components. Developers may utilise Hooks to enhance their single-page application methods by using function-based components.

Function based components

An ordinary JavaScript function that returns the React components that make up the component's user interface is known as a function component in React. Any data supplied from the component's parent is contained in a "props" object, which is accepted as an argument. Function components don't come with state by default, but you may add it using the "useState()" hook. Using function components is the most typical method of defining components in React. Class-based components, however, are still supported and have their uses, such as when interacting with old code or external libraries. Additional hooks in function components, such "useEffect()", can be used to carry out side effects like getting information from a server or changing the page title.
Functional components support the following hooks:
- useState Hook
- useEffect Hook
- useRef Hook
- useCallback Hook
- useMemo Hook
- useContext Hook
- useReducer Hook

Class-Based Components
A class-based component is defined using a JavaScript class that inherits from the "React.Component" class and is declared using the "class" keyword. It includes a "render()" function that returns the React elements that make up the component's user interface. Class-based components can also have state,which

is managed using the "setState()" function. Similar to function components, any changes to state trigger a re-rendering of the component. Syntax differences between function and class components are shown in Figure 3.8 and Figure 3.9. JSX in React Native allows for decoration, organization, and event interaction, as well as the ability to style components using inline styling or external stylesheets and to use layout features like
"FlexBox" to manage the UI layout. Event handlers can also be included in components to respond to user interactions, such as "onPress" for button clicks.



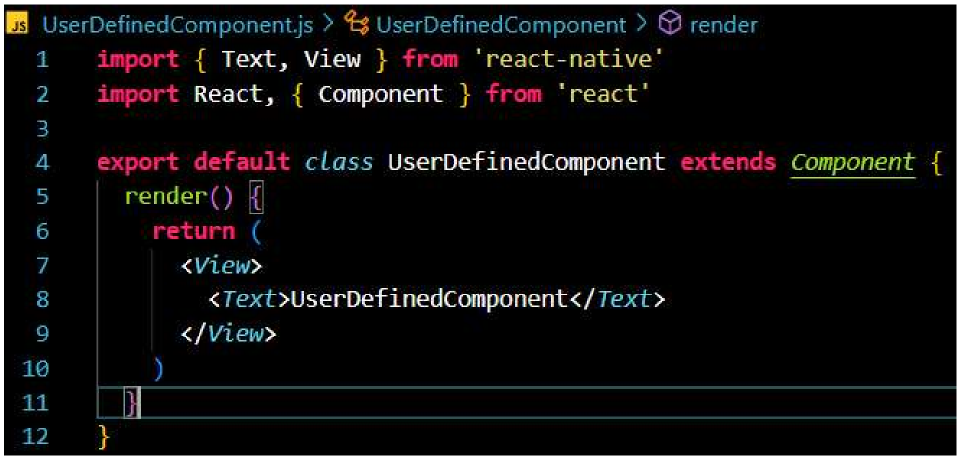
UserDefinedComponent.js > UserDefinedComponent > render

```
import { Text, View } from 'react-native'
import React, { Component } from 'react'

export class UserDefinedComponent extends Component {
  render() {
    return (
      <View>
        <Text>UserDefinedComponent</Text>
      </View>
    )
  }
}

export default UserDefinedComponent
```

Fig 3.8 Function component of Reactjs



UserDefinedComponent.js > UserDefinedComponent > render

```
import { Text, View } from 'react-native'
import React, { Component } from 'react'

export default class UserDefinedComponent extends Component {
  render() {
    return (
      <View>
        <Text>UserDefinedComponent</Text>
      </View>
    )
  }
}
```

Fig 3.9 Function component of Reactjs

Lifespan methods, or methods that are invoked at particular times during the component's lifespan, are likewise included in class-based components. ComponentWillUnmount(), which is called right before the widget is removed from the DOM, and componentDidMount(), which is called after a component has been displayed for the first time, are examples of these operations.

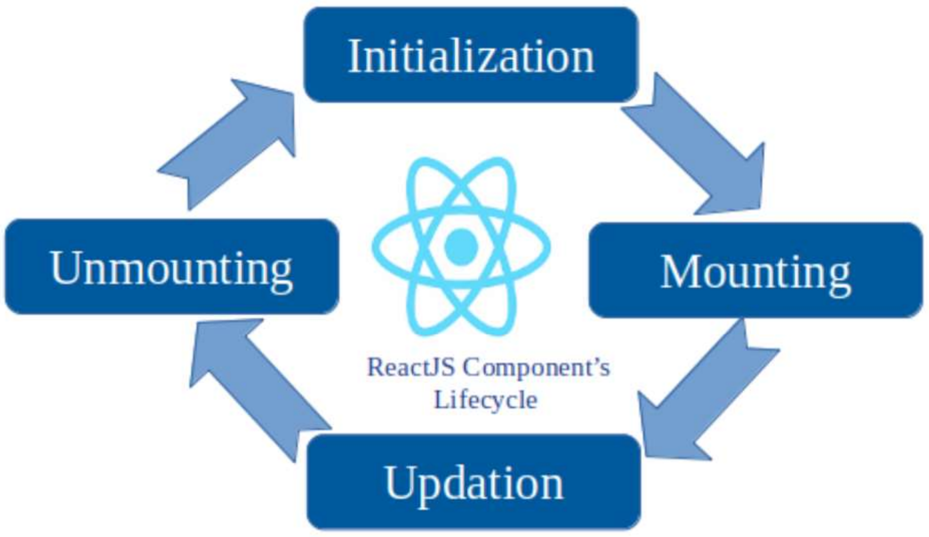


Fig. 3.8 Complete Lifecycle of Component

Fig 3.8 shows the Expo's real-time reloading function which is a significant additional advantage of using Expo. This eliminates the requirement to compile over again or rebuild the programme and enables developers to observe changes to their code in real-time. This may help your development process move along much more quickly and make it simpler to continue working on the application itself. Additionally, Expo has a function called over-the-air updates that enables programmers to push improvements to their applications without having to wait for users to install the latest version via the app store[5]. This makes it simple to update the application with fresh capabilities and address issues without affecting the user experience.

- **Cross-platform development:** By separating away platform-specific aspects and offering a standard API for gaining utilisation of device functionalities, Expo allows it to be simpler to design programmes that work on both the iOS and Android platforms.
- **Simplified setup** : Expo makes it unnecessary to do difficult setup and configuration procedures, making it simple for developers to begin working with React Native.
- **Expo's hot reloading:** Expo's hot-reloading feature enables developers to view updates made to the code in real-time without requiring them to recompile or recreate the entire application.
- **Pre-built components:** Expo comes with a number of pre-built user interface (UI) elements that may be readily modified to meet the requirements of your application. Examples of these include <Button> ,<Text>, <Image>, <TextInput> , e.t.c..

Node.js

For creating server-side applications, such as online and mobile applications, Node.js is a well-liked technology. It looks like Node.js is being utilised in your situation to create a delivery app. Node.js is a wonderful option since it excels at handling several connections at once and processing data rapidly for real-time applications. It is also simple to add new features and functions to your application thanks to the big and active community that supports Node.js and offers a variety of modules and packages. Node.js is an excellent option for your delivery app project since it is a strong tool for creating reliable and scalable server-side apps.
In this project Node.js is used for building the complete back-end of this project. The features of Node.js for choosing it over other technologies are as follows:

- **JavaScript Runtime:** Using the framework of Node programmers are able to execute the code that uses JavaScript independently of a web browser. As a result, programmers can apply JavaScript to create the server-side portion apps, command-line tools, and other kinds of software.

- **Event-Driven Architecture:** Programmers may run JavaScript code without the need for a web browser by using the Node framework. JavaScript may therefore be used by programmers to build server-side apps, command-line tools, and other types of software.

- **Support for Multiple Databases:** Node.js supports both relational and non-relational databases. This makes it straightforward to choose the best database for your application based on your particular needs and requirements.

- **Simple to Learn:** Node.js is relatively easy to understand and implement for programmers who are already familiar with JavaScript. This suggests that programmers won't need to learn a completely new programming language or environment in order to start creating server-side apps utilising Node.js right away.

- **Wide-ranging Modules:** Wide range of modules and packages are created and maintained by a huge and active community: Node.js has a tremendous and engaged community of contributors. To offer additional capabilities and features, these extensions may be readily incorporated into applications written in Node.js.

Node.js was developed on top of the V8 JavaScript engine, that has been substantially optimised for speed and is compact. Node.js is hence able to operate quickly and consume less of the system's resources compared to other server-side platforms. Asynchronous programming, or asynchronous programming, is another feature of Node.js that enables programmers to create quick-running code.

Express.js

Express.js is a rapid, lightweight web framework built on Node.js that comes with a variety of helpful features for building APIs and online applications. It is built on Node.js and provides a straightforward API, simplifying the process of developing online and mobile apps. Express.js's server-side features may be used to do a range of tasks, such as handling incoming requests, authorising users, and managing errors. Middleware services can be connected in a pipeline to create complex request-response processes.

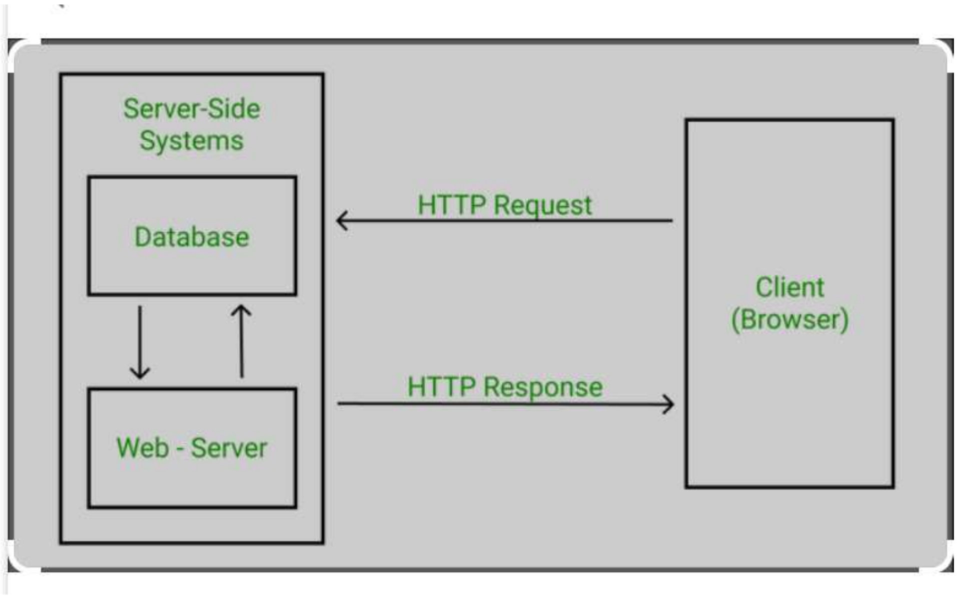


Fig. 3.9 Flow of requests and response from client to server

Express.js is widely used to build application programming interfaces (APIs), which allow communication between various programme components. An API enables the creation of complex software platforms by providing a standard interface for software to exchange data and services. Express.js provides a simple and intuitive API that makes building APIs easy. By designing routes that correspond to the different HTTP methods, developers may construct functions that handle GET, POST, PUT, and DELETE requests. Express.js offers a number of intermediate activities, such as processing received JSON data, authorising users, and handling failures. Express.js may also be used to create a RESTful API, an architectural framework for creating APIs that follows a set of guidelines. Modify resources using RESTful APIs(like data objects) while offering replies in an accepted format (like JSON) via HTTP methods.

Security and scalability are crucial factors to take into account while developing an API with Express.js. Data in transit may be made more secure with the support for SSL/TLS encryption that Express.js offers. Additionally, it encourages rate limiting along with other attack-prevention strategies. Benefits of using Express.js for building APIs in React Native project:

- **Scalability:** Express.js is very scalable and can handle many concurrent connections without experiencing any lag. It can be set up on a group of servers or a platform that uses the cloud, like AWS or Google Cloud.

- **Security:** Express.js supports SSL/TLS encryption, which helps to protect data while it is being transmitted. Additionally, it encourages limitation of rate and other attack-prevention strategies.

- **Large Community:** Strong and well-known developer ecosystem: Express.js has a large and vibrant developer ecosystem that creates and maintains a range of modules and libraries that are easily included into Express.js programmes to offer new features and opportunities. The platform also includes outstanding documentation that is easy for developers to understand and utilise.

Google Firebase

A platform called Firebase, developed by Google, provides a variety of tools for building and growing mobile and online apps. since of the variety of tools and services it offers, it is a popular choice for developers utilising React Native since it may facilitate development and save time to market. The characteristics offered by the firebase in-built portion are listed in Fig. 3.9.

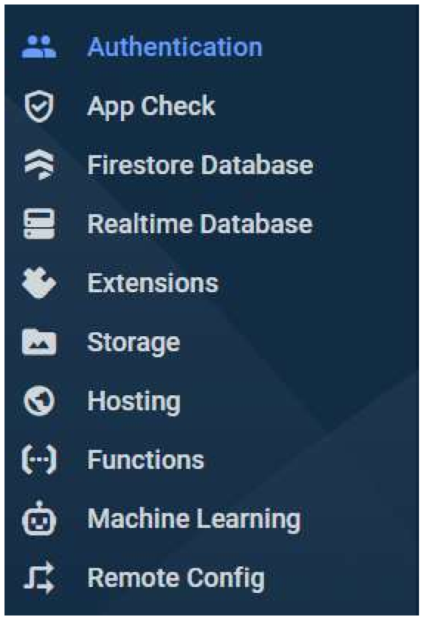


Fig 3.10 List of Firebase features

Key details regarding Firebase for React Native applications is provided below:

1. To store and sync data instantly, one option is to use Firebase Realtime Database, a cloud-hosted database. It provides a NoSQL database, making it easy to manage information in a flexible, scalable way[3, 4]. The Firebase Live Database may be used to construct applications that respond instantly to data changes, enhancing their interactivity and user attractiveness.

2. Using Google Authentication is a quick and simple way to add authentication to your React Native application. Social media, phone, email, passwords, and other methods of authentication are supported[6]. With Firebase Identification, you can develop secure apps that request user authentication and authorization. In this project, the sole type of authentication we're focusing on is phone number authentication. OTP is generated and sent to the provided cellphone number. For added protection, this OTP has a configurable life duration.

3. User-generated material with a large size, such photographs and videos, may be easily stored and served with Firebase cloud-based storage. It allows for both local and remote storage, allowing access to material from any location in the globe. For a full storage solution for your React Native application, Firebase Cloud Storage interfaces with other Firebase services like Authorization and Dynamic Database.

4. FCM (Firebase cloud messaging) is another capability offered by Google Firebase. The stable and scalable Firebase cloud-based messaging service enables message delivery to clients on Android, iOS, and the web. It makes it simple to provide timely and pertinent communications to individuals by providing a number of features, such as targeting, planning, and statistical analysis. As a result of its ease of use, scalability, and compatibility with other Google services, it is a well-liked choice among developers who utilise React Native.

Stripe for Payment

ACompanies of any sort may accept and manage payments online thanks to a programme called Stripe that handles payments. Businesses may conveniently and efficiently make payments using a range of services and applications that are provided by this[5]. Globally, a lot of businesses, including sole proprietors, small businesses, and big multinationals, use Stripe[12]. Stripe supports all payment types, including debit and credit card payments as well as card payments of all kinds, including mastercard, visa, and UPI payments. Below are a few of Stripe's salient characteristics:

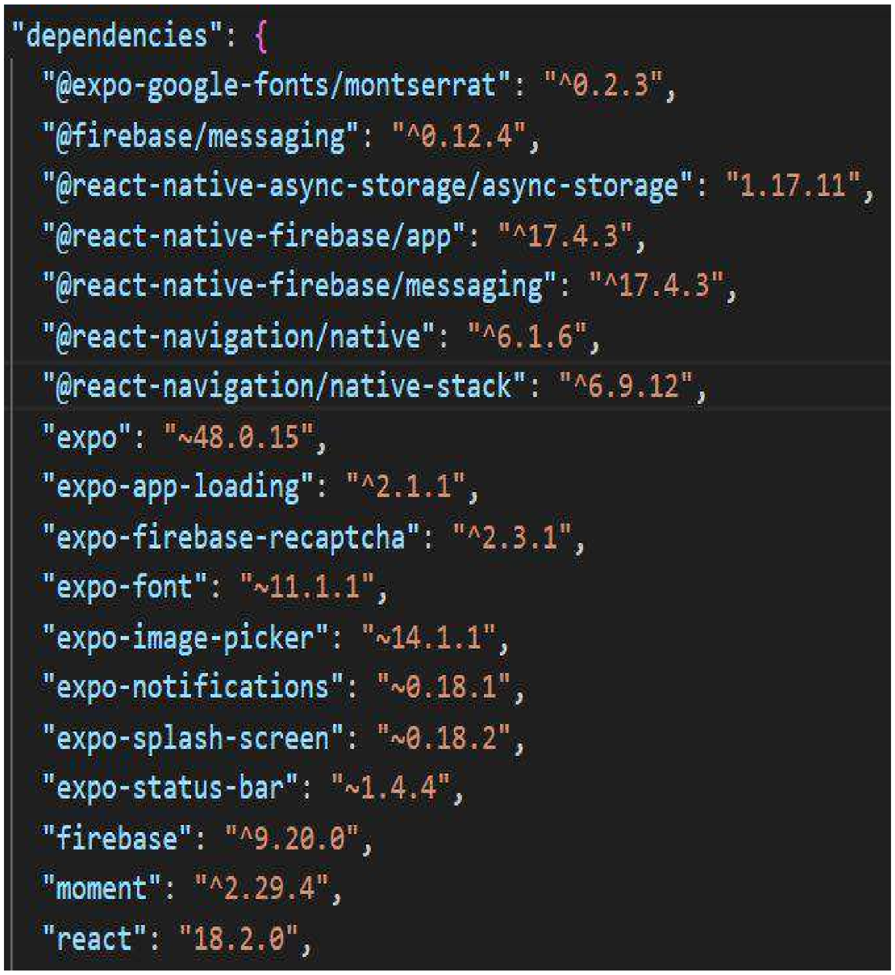
- **Payment methods :** Online payment processing is made simple and safe by Stripe. Numerous payment options, such as debit and credit card transactions, and payments via mobile devices are supported. All aspects of payment processing, such as identifying fraudulent transactions, reimbursements, and currency conversions, are handled by Stripe. Additionally, it supports memberships and periodic payments, making it simple for businesses to handle customers' payments over time.

- **Security :** Safety is a top priority for Stripe, which offers a range of solutions to help businesses keep their transactions secure. The greatest level of validation accessible to payment processors is the PCI Level 1 Service Provider accreditation that it possesses. The Stripe platform also provides fraud detection and prevention capabilities including multi-factor authentication, real-time

- **Global Reach :** With around 135 recognised denominations and over 40 operating nations, Stripe makes it simple for business establishments to take payments through clients all around the globe. International payments are handled entirely by Stripe, involving conversions of currencies and observance of regional laws.

- **Billing :** It is straightforward for businesses to manage recurring membership and payment fees thanks to a group of software packages known as invoicing. It provides tools for setting up pricing schemes, managing users and payments, and handling declined payments. Stripe Billing collaborates with other Stripe services like Payment Processing and Hawkeye to provide comprehensive billing solutions.

Thanks to a range of goods and services provided by Stripe, businesses may easily manage and accept payments made over the internet. With solutions for payment processing, developer tools, security, worldwide reach, billing reasons, and the detection of fraudulent transactions, Stripe provides a whole platform for managing payments in your React Native application. It is preferred by businesses of all types due to its adaptability, protection, and ease of use.



```
"dependencies": {
  "@expo-google-fonts/montserrat": "^0.2.3",
  "@firebase/messaging": "^0.12.4",
  "@react-native-async-storage/async-storage": "1.17.11",
  "@react-native-firebase/app": "^17.4.3",
  "@react-native-firebase/messaging": "^17.4.3",
  "@react-navigation/native": "^6.1.6",
  "@react-navigation/native-stack": "^6.9.12",
  "expo": "~48.0.15",
  "expo-app-loading": "^2.1.1",
  "expo-firebase-recaptcha": "^2.3.1",
  "expo-font": "~11.1.1",
  "expo-image-picker": "~14.1.1",
  "expo-notifications": "~0.18.1",
  "expo-splash-screen": "~0.18.2",
  "expo-status-bar": "~1.4.4",
  "firebase": "^9.20.0",
  "moment": "^2.29.4",
  "react": "18.2.0",
```

Fig 3.11 List of Dependencies in Package.json

Chapter - 4
Experiments and Result Analysis

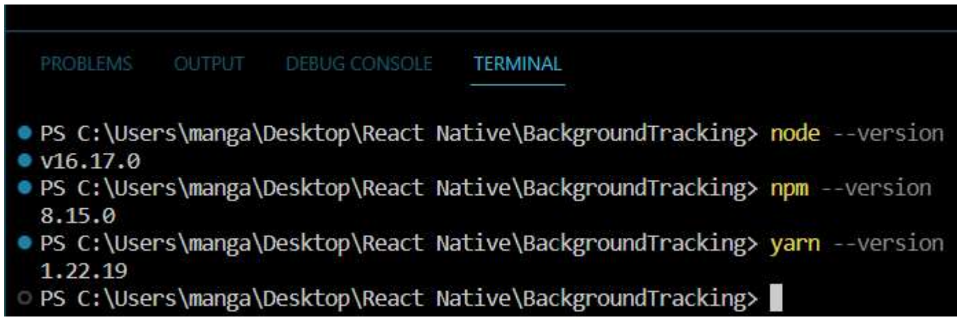
First, we initialised our React Native project within the specified folder. Node and yarn installation are prerequisites for initialising the React Native application. React-native-cli has to be installed globally on our system once node and yarn have been installed[14, 13]. When we start a new React Native project, installing the React Native CLI globally will automatically add this package to our application. The code for installing the react-native-cli globally is shown in Fig. 4.1.

```
npm install -g expo-cli
expo init AwesomeProject

cd AwesomeProject
expo start
```

Fig 4.1 Commands for installing cli and initialising app

The latest version of node, npm and yarn are used in the development of this project to keep the requirements and functionality of this project. Fig 4.2 shows the version of the same.



```
PS C:\Users\manga\Desktop\React Native\BackgroundTracking> node --version
v16.17.0
PS C:\Users\manga\Desktop\React Native\BackgroundTracking> npm --version
8.15.0
PS C:\Users\manga\Desktop\React Native\BackgroundTracking> yarn --version
1.22.19
PS C:\Users\manga\Desktop\React Native\BackgroundTracking>
```

Fig 4.2 Versions of technologies used

There are several modules and pages in this project starting from the Welcome Screen we have and many, numerous screens or "views" that collectively make up your application's user interface are typical. Each screen serves as an individual component of your mobile application and may have various features and functionalities. Table 4.1 shows the list of screens given below.

S. No.	**Screen Title**	**Functionality**
1.	Welcome Screen	It gives the user an option to register or an existing user to sign-in to their respective accounts.
2.	Login Screen	In this screen the user needs to enter the registered mobile number and press submit and he will move to the next screen.
3.	Register Screen	If the user is not registered (new user), he has to enter a mobile number to get himself registered.
4.	Verification Screen	In this screen there is a user input of 6 digits in which the user needs to enter the OTP which he got via SMS on the entered mobile number.
5.	Home Screen	In this screen the user can press on "Modal" for different functionalities, here he gets the button to set pick up and destination locations.
6.	Task Screen	In this screen the user needs to enter the destination and source locations along with the order that needs to be delivered.
7.	Confirmation Screen	This screen is for rechecking the source and destination location and confirming the address.
8.	Order Details Screen	This screen shows the user the details he has filled in the previous pages along with the delivery charges and proper billing details.
9.	Payment Screen	If the user confirms the details he is then landed on the payment screen where he can add a new card or make payment with already added cards just by filling necessary card details.
10.	Track Order Screen	The user is then able to see the real-time tracking of the delivery partner on a

		Map.
11.	Feedback Screen	After the item gets delivered the user of the application is then able to rate and write some reviews about the delivery partner.
12.	Edit Profile Screen	This is a feature screen of this application where the user can edit its profile except for his mobile number.
13.	Notification Screen	This screen shows the notification of the items that have been delivered or picked up.
14.	Chat Screen	The user will be able to chat with the admin and communicate about his problems or any other delivery issues.

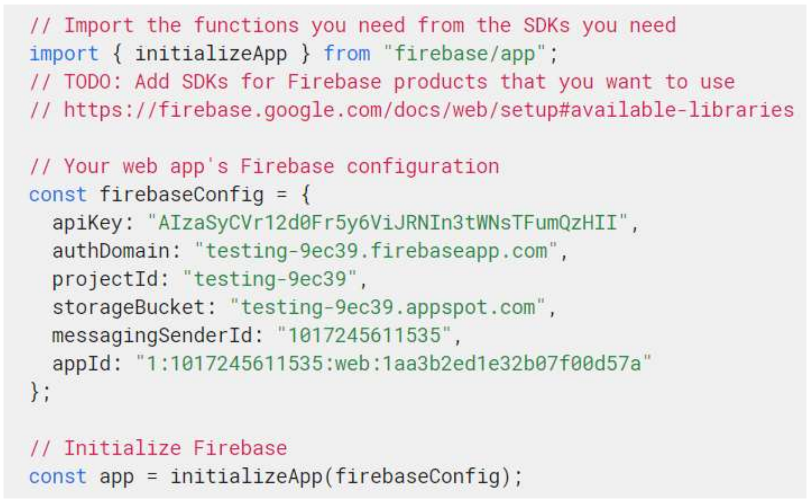
Table 4.1 List of screens

User Authentication using Firebase

Google Firebase offers us a number of options for authenticating the user providing a guaranteed security to the user. In this application I have only used mobile authentication because of easy implementation, better security as well as it provides better user experience. The usage of the mobile OTP in Google Firebase offers mobile applications a safe and practical authenticating technique that may boost user experience while also lowering the danger of credential fraud. This generates a six-digits OTP and sends it to the entered and existing mobile number and expires after 5 minutes. After initialising a new project in google firebase and choosing the platform, Google Firebase provides us configuration content which contains following fields as shown in Fig 4.3

1. API - Key
2. Auth Domain
3. Project Id

4. Storage Bucket
5. Messaging SenderId
6. Application Id



```
// Import the functions you need from the SDKs you need
import { initializeApp } from "firebase/app";
// TODO: Add SDKs for Firebase products that you want to use
// https://firebase.google.com/docs/web/setup#available-libraries

// Your web app's Firebase configuration
const firebaseConfig = {
  apiKey: "AIzaSyCVr12d0Fr5y6ViJRNIn3tWNsTFumQzHII",
  authDomain: "testing-9ec39.firebaseapp.com",
  projectId: "testing-9ec39",
  storageBucket: "testing-9ec39.appspot.com",
  messagingSenderId: "1017245611535",
  appId: "1:1017245611535:web:1aa3b2ed1e32b07f00d57a"
};

// Initialize Firebase
const app = initializeApp(firebaseConfig);
```

Fig 4.3 Config file generated by firebase

After the user login to their respective accounts the most important and challenging task is to keep them logged-in until they logout from the application. In any application if we are not preserving the Auth state of the user, the individual will automatically get logged out of the application. To achieve this we have to keep the user Auth preserved and pass it on throughout the application [5]. The application's login and registration interface is seen in Fig. 4.4. The login screen's functionality allows users to sign up for accounts or sign in if they already have an account. The purpose of the Register page is to need the user to provide a cellphone number in order to register if they are a new user. To authenticate the user, a One Time Password is generated and sent over Firebase to the user's phone. Both first-time registrants and accounts with active registrations go through the same process.

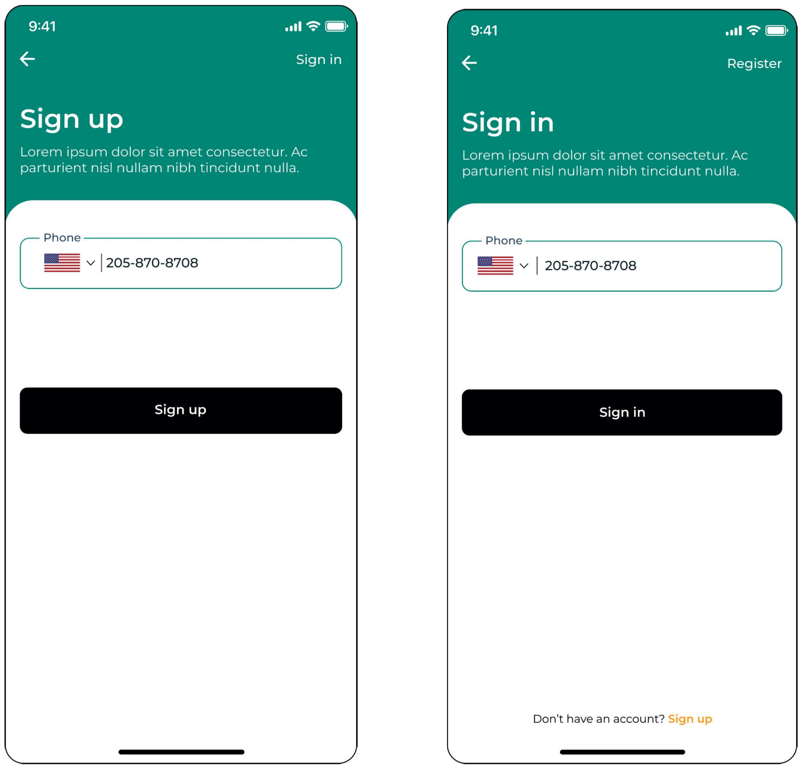
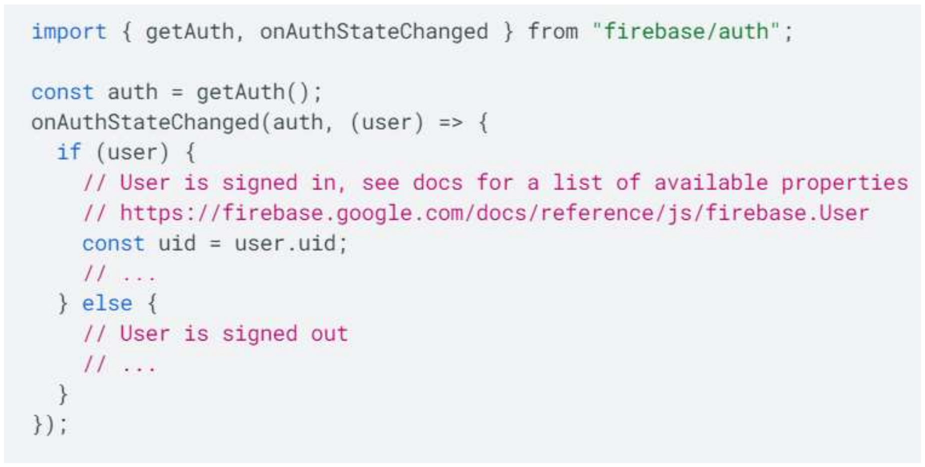

9:41
Sign in
Sign up
Lorem ipsum dolor sit amet consectetur. Ac parturient nisl nullam nibh tincidunt nulla.
Phone
205-870-8708
Sign up
9:41
Register
Sign in
Lorem ipsum dolor sit amet consectetur. Ac parturient nisl nullam nibh tincidunt nulla.
Phone
205-870-8708
Sign in
Don't have an account? Sign up

Fig 4.4 Login and Register screens of application

Four different approaches can be used to complete the aforementioned challenge: the first is prop drilling, in which we will send a specific user's Auth to various components; the second is using Context API and making all the user configuration fields global variables; and the third is using Redux Toolkit. By leveraging context API and prop drilling in this application, I was able to do this. Utilising React Native's Async-Storage is another way we may accomplish our goal. It's crucial to keep in mind that AsyncStorage has several drawbacks, like its restricted capacity for storage and incapacity for handling massive volumes of data.

AsyncStorage isn't intended to be used as a reliable archive solution, thus developers should be mindful of this and store private information using stronger storage alternatives.



```
import { getAuth, onAuthStateChanged } from "firebase/auth";

const auth = getAuth();
onAuthStateChanged(auth, (user) => {
  if (user) {
    // User is signed in, see docs for a list of available properties
    // https://firebase.google.com/docs/reference/js/firebase.User
    const uid = user.uid;
    // ...
  } else {
    // User is signed out
    // ...
  }
});
```

Fig 4.5 Code for persisting the user

Dashboard and Modal

Using a React Native component called a modal, developers may create pop-up conversation boxes, alerts, notifications, and confirmations by showing an element or piece of content above the presently shown screen. Modals are typically used to solicit user input, display critical information, or require user confirmation of actions. The Home Screen is seen in Fig. 4.3, and a "Modal" that opens over the screen informs the user of the application's functions as listed in Table 4.1. This "Modal" component, which is native to React, gives us an animation for a specific view. This "Modal View" will become visible when a user clicks on the menu icon. Additionally, it offers a variety of tools that enable us to improve our application's effectiveness, usability, and more responsive. For e.g. onRequestClose() function provided by this lets the user dismiss the modal when he clicks the back button of his device.

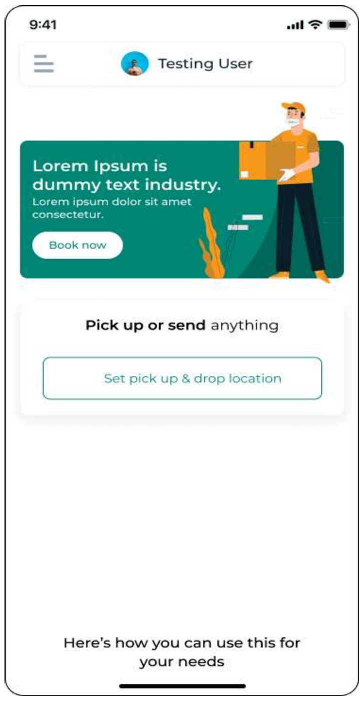

9:41
Testing User
Lorem Ipsum is dummy text industry.
Lorem ipsum dolor sit amet consectetur.
Book now
Pick up or send anything
Set pick up & drop location
Here's how you can use this for your needs

Fig 4.6 Home screen of application

Google Maps

With the aid of Google Maps, which I have incorporated into my project, the user may choose the pick-up location and will see the auto-fill function. With the help of this feature, the user can more easily identify the pick-up and destination locations. Additionally, he may pin-point the present place and add markers to the spots. Users get access to a large selection of features and functionalities, such as interactive maps, geotagging, directions, and locations. After completing a payment, the consumer will be able to view the delivery person's direction directly on the Order Tracking screen thanks to the Google Maps API[3, 4].

MapBox and MapView are further alternatives for adding maps to our programme.We can incorporate maps GUI in this project thanks to the MapView component of the React Native react-native-maps package. We have a logo on the map, and as the rider moves, the latitude and longitude change, causing the image of the bike shown on the map to move as well[10].

I'm using the delivery partner's latitude and longitude to track down their route. Each time their latitude and longitude change, we update their position in our array.

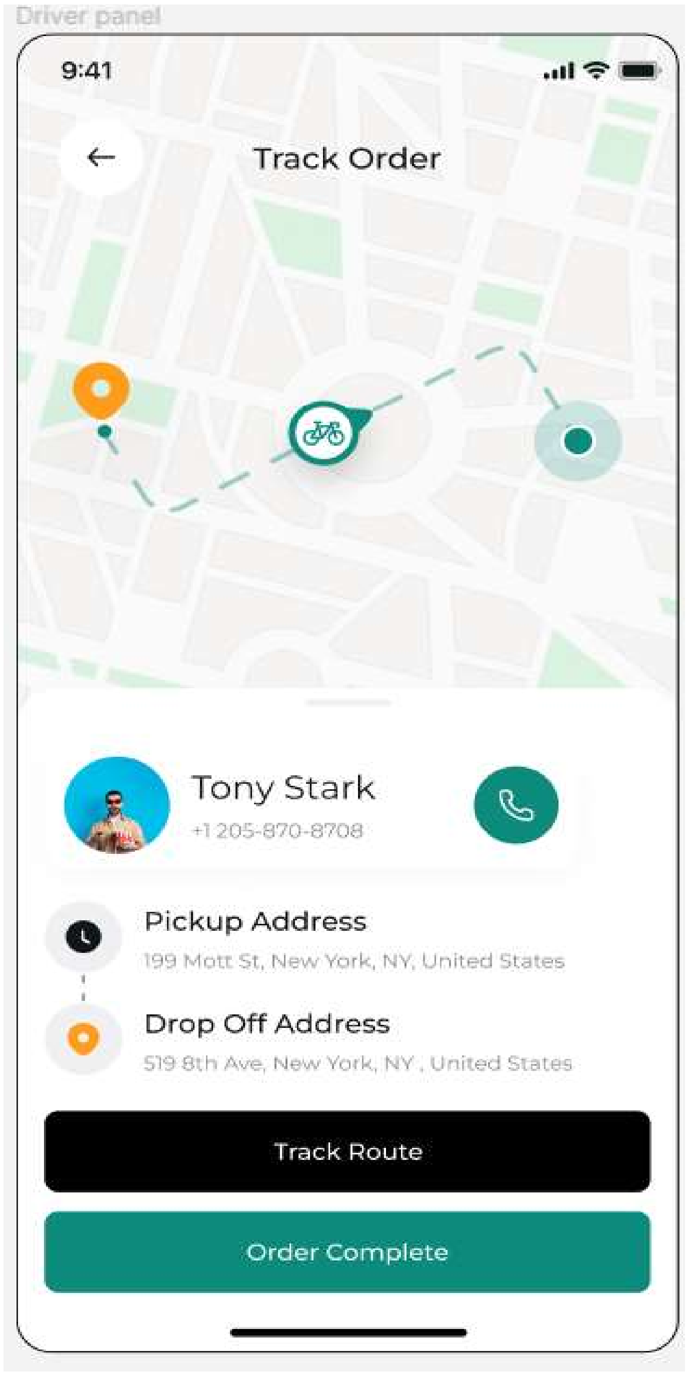
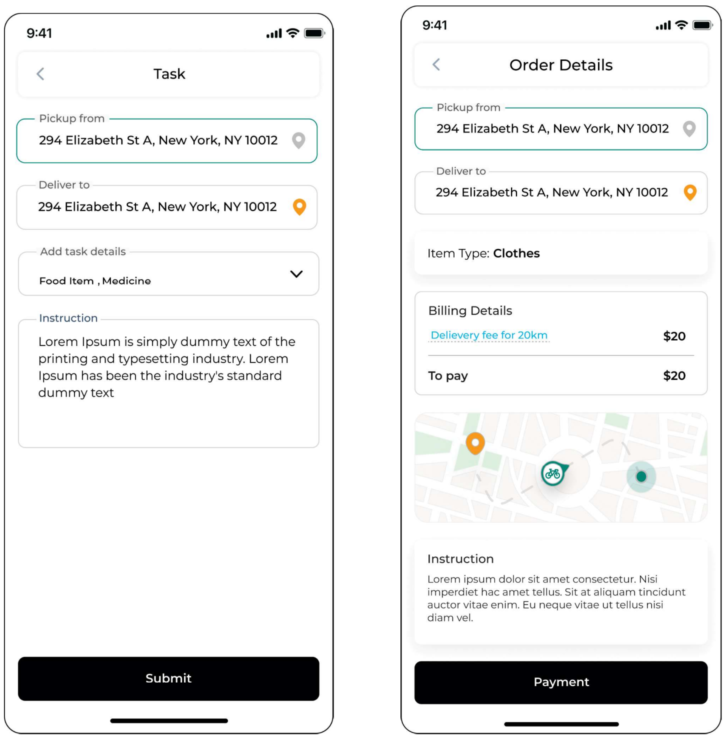


Fig 4.7 Order tracking using MapView

Order Details Screen

Once the user confirms the pickup and drop location and presses on the "Submit" button he will be taken to the next screen where he would be getting the order details, here by clicking on the map marker he can change the pick up and drop location. As shown in fig 4.7, he can also add some instructions that he wants to tell the delivery driver. The user of this application will get a detailed screen of the invoice. The fare for delivering the item from one place to another totally upon the distance between the two points. The distance between the pickup and drop location can be calculated with the help of Google API which will first fetch the latitude and longitude of the source and destination and return the fastest route between these two locations.



9:41

Task

Pickup from
294 Elizabeth St A, New York, NY 10012

Deliver to
294 Elizabeth St A, New York, NY 10012

Add task details
Food Item , Medicine

Instruction
Lorem Ipsum is simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text

Submit

9:41

Order Details

Pickup from
294 Elizabeth St A, New York, NY 10012

Deliver to
294 Elizabeth St A, New York, NY 10012

Item Type: **Clothes**

Billing Details

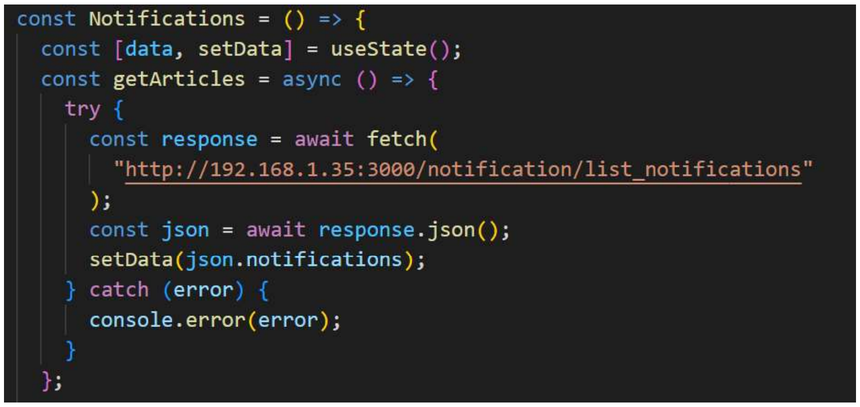
Delievery fee for 20km	$20
To pay	$20

Instruction
Lorem ipsum dolor sit amet consectetur. Nisi imperdiet hac amet tellus. Sit at aliquam tincidunt auctor vitae enim. Eu neque vitae ut tellus nisi diam vel.

Payment

Fig 4.8 Order details screen

The backend of the application is where the programme stores all order and user-related data. All of a new user's information will be saved on the servers if he establishes a new account. Any modifications the user makes to his profile are recorded in the application's backend. We are retrieving all of the data and putting it on the application's front end. We have a built-in React Native method named "Fetch" that we can use to fetch this.



```
const Notifications = () => {
  const [data, setData] = useState();
  const getArticles = async () => {
    try {
      const response = await fetch(
        "http://192.168.1.35:3000/notification/list_notifications"
      );
      const json = await response.json();
      setData(json.notifications);
    } catch (error) {
      console.error(error);
    }
  };
```

Fig 4.9 Syntax of fetch function to GET from API

The response object that is returned by the fetch request function resolves a Promise. Response data, including the content of the response, its status, and headers, is stored in the Response object. The data may then be extracted from the response using techniques like.json(),.text(), and.blob().

Online Payment

Leading payment service Stripe enables entities to take transactions online. An array of processes are taken in the back end when an end user makes an online payment on a mobile application or website that makes use of Stripe. Fig 4.9 shows what happens at the backend when somebody initiates a transaction.

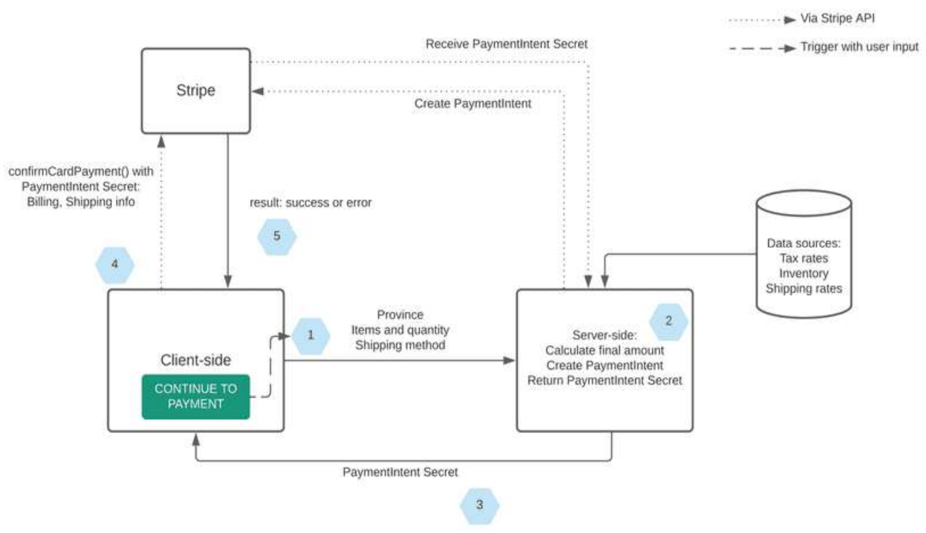
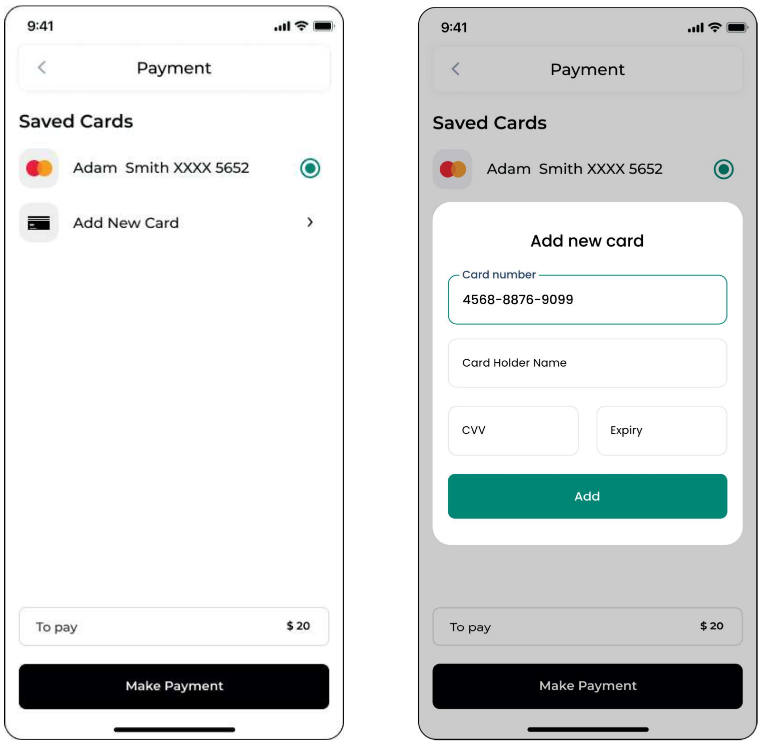

Via Stripe API
Trigger with user input
Stripe
Receive PaymentIntent Secret
Create PaymentIntent
confirmCardPayment() with PaymentIntent Secret: Billing, Shipping info
result: success or error
5
4
Data sources: Tax rates Inventory Shipping rates
Client-side
CONTINUE TO PAYMENT
1
Province Items and quantity Shipping method
2
Server-side: Calculate final amount Create PaymentIntent Return PaymentIntent Secret
PaymentIntent Secret
3

Fig 4.10 Backend of user initiated online payment

I only included card payment choices in my project so that people could use Stipe to make payments online. The new user must first add a card to the payment application in order to start a payment. Credit cards or debit cards may be used to make this card payment. The following details must be entered by the user.

- Card Number ,Card Holder's name, CVV, Expiry Date
- This Information get validated first on the front-end
- If the information is validated by the Stipe.

Fig 4.10 shows that when the user clicks on the “Add New Card” a dialogue box opens up and shows the card details that are needed to be entered by the user to add a new card for making payment.



Card number
4568-8876-9099

Fig 4.11 Payment Screen of application

When a delivery partner accepts the request to pick up the items, he will receive all the details on the item that needs to be delivered along with the pickup and drop location with this. The user's side of the application is now complete after completing the payment.

Chapter - 5
Conclusion

5.1 Conclusion

The best degree of full-stack application development involves fixing several issues that aren't present in applications that are identical to this one. As it would be offering customer support, a chat option, live tracking, and many other services not offered by current top programmes, it might also become a superior substitute.

Every answer, rejection, and error was handled in such a way that it didn't slow down the application. This application was linked with the backend, allowing us to receive and get the replies from there. In this research, we've covered the primary elements and features of this product delivery application, including push notifications, real-time tracking, and payment methods. Reusing code, having shorter development cycles, and having a large designer community are all benefits of using React Native for the creation of applications, and these benefits have all been stressed.

This React Native product delivery app is a great example of how individuals can utilise tablet and smartphone technology to improve customer satisfaction, optimise business operations, and increase income. As the mobile environment continues to change, we should expect to see more cutting-edge applications developed using React Native and other cutting-edge technologies. Customers and drivers alike will be able to add their photos using this application for enhanced experience and identification. We utilised "ImagePicker" for this, another capable package provided by React Native. With the aid of this library, we may put a picture on our device. Android and iOS devices need authorization to do any of the aforementioned functions, which makes the application more secure for the user.

Google Firebase where the users are stored is also counting the number of reads and writes we are making each day. As shown in Fig 4.1 and Fig .2 , we can see the count of reads and writes. The dotted lines also show the average number of reads and writes per week.

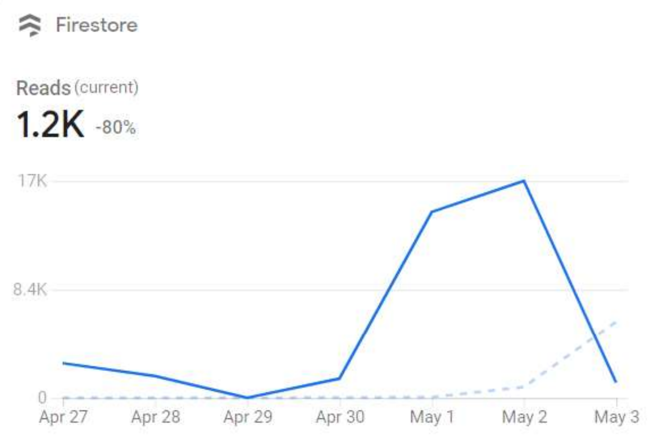


Fig 5.1 Reads per day underdeveloped.

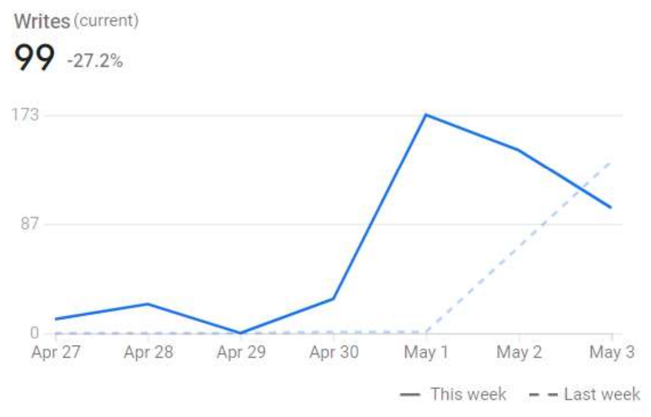
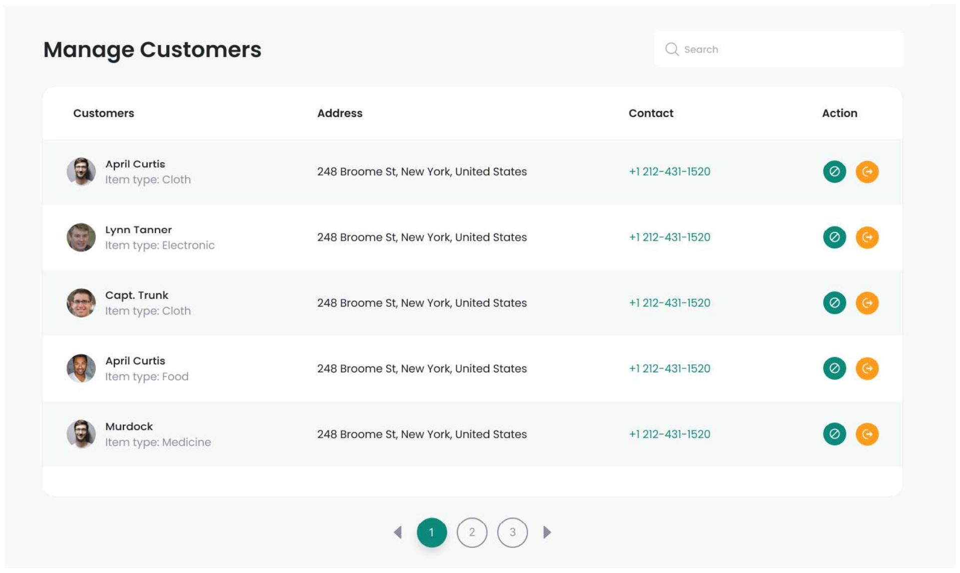


Fig 5.2 Writes per day underdeveloped

At the initial stage we started to work on the dummy data and in fig 5.3 that the user is getting stored at the backend and is handled very efficiently. The delivery partner is getting stored at the backend of the application along with all their details, how many orders they have ever got out of which how many of them were successfully delivered.



Manage Customers

Customers	Address	Contact	Action
April Curtis Item type: Cloth	248 Broome St, New York, United States	+1 212-431-1520	
Lynn Tanner Item type: Electronic	248 Broome St, New York, United States	+1 212-431-1520	
Capt. Trunk Item type: Cloth	248 Broome St, New York, United States	+1 212-431-1520	
April Curtis Item type: Food	248 Broome St, New York, United States	+1 212-431-1520	
Murdock Item type: Medicine	248 Broome St, New York, United States	+1 212-431-1520	

Fig 5.3 Dashboard of admin-side

5.2 Future Scope

This project can be made more complex, and we can give the programme more features. The following is a list of the functions that may be added to our application to improve its effectiveness and user experience:

- **More Payment Options :**I've just included card payment options (credit card and debit card) thus far in my application. But in addition, there are additional UPI payment methods like Google Play, Paytm, and others.

- **Chatbot support :** A chatbot function may be used to respond to client questions and offer prompt solutions. Wait times might be cut in half and customer service could improve.

- **More login options :** The user of the application can only sign-in only using a phone number, but in future we will integrate email login with phone number, so that the user can have more options to sign-in.

- **More transport options :** Depending on the type of product we want to transport, we may add more vehicle alternatives. For heavier things and commodities, the customer will be able to hire a bike or a mini-truck.

- **Multilingual support :** To reach a larger audience, think about providing support for multiple languages to your software.

- **Real-time tracking :** Real-time tracking is something you might want to incorporate into your delivery app. Customers will be able to track their orders in real-time and receive precise delivery predictions as a result.

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