An-Najah National University

Department of Computer Engineering

Faculty of Engineering & Information Technology

Software Graduation Project

PalWheel

Done By

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Fall 2023

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Acknowledgment

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First and foremost, we are thankful to God for providing us with the strength and endurance needed to see this project through.

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We also want to acknowledge the support of our families and friends, whose encouragement and guidance were instrumental in our success.

Lastly, we extend our thanks to everyone who contributed to the completion of this project. Your cooperation and efforts are greatly appreciated.

Disclaimer Statement

This report was written by students: Baraa Sawafta and Majed Kawa at the Computer Engineering Department, Faculty of Engineering, An-Najah National University. It has not been altered or corrected, other than editorial corrections, as a result of assessment and it may contain language as well as content errors. The views expressed in it together with any outcomes and recommendations are solely those of the students. An-Najah National University accepts no responsibility or liability for the consequences of this report being used for a purpose other than the purpose for which it was commissioned.

Abstract

We understand that there are numerous challenges when it comes to moving from one place to another. Issues like difficulty in finding a vehicle on time, road congestion, and traffic crises can lead to delays and inconvenience in reaching our destinations. These challenges prompted us to develop a solution aimed at saving users' time and ensuring a smooth travel experience.

Our goal with this app is to provide a hassle-free transportation solution. To use the app, the user will need to sign in initially. Once signed in, they can easily locate the nearest available vehicle based on their current location using the integrated map feature. Additionally, users can access driver reviews and ratings to make informed choices before making an appointment.

After reaching their destination, users have the flexibility to make payments to the driver either online or in cash, ensuring a convenient and user-friendly experience.

It's worth noting that while similar applications like Uber exist, they may not be available in Palestine. Our app, however, will be accessible in Palestine, providing a much-needed transportation solution tailored to the local environment. We are committed to making travel in Palestine more efficient and convenient for all users.

Chapter 1: Introduction

1.1 Statement of the problem:

We came up with this idea to provide hassle-free transportation and to solve the problem of the congestion of the transportation and the crowded people across the streets and to provide transportation to the remote areas that have no direct access to transportation therefore being late to their appointments.

1.2 Project Objective:

The main goal is to make people's lives easier by offering them the ability to book their ride at any time and anywhere, which enables them to reach their appointments on time and avoid traffic crises.

1.3 Project Significance:

We created this app to improve accessibility to the transportation services that offer a convenient solution. Users can easily choose their rides, reducing the waiting time. Also connect the drivers with the users in real-time.

Also implementing safety features within the app, such as driver identification, live tracking, and emergency services integration, enhances passenger safety.

1.4 Report Organization:

Chapter 1: Introduction to the problem, the objectives and significance.

Chapter 2 : Theoretical background and previous work.

Chapter 3 : Standards, constraints, tools and methods.

Chapter 4 : Results and analysis.

Chapter 5 : Discussion.

Chapter 6 : Conclusions and Recommendations.

Chapter 2: Theoretical Background and Previous Work

2.1 Theoretical Background:

This chapter achieves two goals: it first gives readers a solid understanding of the theoretical frameworks that guide the operation and design of our app, and it also sheds light on the state of the literature about earlier on-demand transport services.

2.1.1 On-Demand Service Model

To understand our application's theoretical foundations, we first investigate the idea of on-demand service models. This involves being aware of the fundamentals of dynamic resource allocation, real-time service delivery, and the role that technology plays in enabling smooth communications between users and service providers.

2.1.2 User Experience Design

The user interface and user experience are crucial to its success. In order to make sure that our application is clear and user-friendly, taking into account elements like usability.

2.2 Previous Work

We've checked out a few apps like Uber and Mashaweer, which operates specifically in Bethlehem. We used these apps to get some ideas on how they work and what features they offer. This helped us understand the functionality and user experience of such applications.

Chapter 3: Methodology

3.1 Standards:

MVC (model view controller):

- Model: which represents the data and the business login in the app and the model is independent from the user interface and does not directly communicate with the view.
- View: which represents the data to the user and displays the GUI to the user and it takes the information from the model and renders it in a way that the user can understand it.
- Controller: it lies between the model and the view it receives the data from the view and process it then updates the model accordingly.

3.2 Constraints

Creating Our app demands careful consideration of various constraints. Economically, the design must stay within budgetary limits and uphold fair pricing. Societal concerns involve prioritizing accessibility and user privacy. In politics, the app should champion equality and comply with regulations. Ethically, it must respect intellectual property and legal standards. Health and safety considerations include prioritizing user and driver well-being.

3.3 Tools, Methods and Programming Languages

3.3.1 Tools

- Visual Studio Code
- Android Studio
- Xampp
- Firebase

3.3.2 Programming Languages

- We used flutter as a Front-End language.
- And we used firebase for both notification and chatting.
- Also, we used php as a Back-End Language.

Chapter 4: Results

4.1 Database

We used phpMyAdmin to store the data in the tables and to handle it.

we used these tables on our app

Table	Action	Rows	Type	Collation	Size	Overhead
admin	Browse Structure Search Insert Empty Drop	2	InnoDB	utf8_general_ci	16.0 KiB	-
card	Browse Structure Search Insert Empty Drop	2	InnoDB	utf8_general_ci	32.0 KiB	-
carinfo	Browse Structure Search Insert Empty Drop	4	InnoDB	utf8_general_ci	32.0 KiB	-
comment	Browse Structure Search Insert Empty Drop	6	InnoDB	utf8_general_ci	48.0 KiB	-
drivers	Browse Structure Search Insert Empty Drop	9	InnoDB	utf8_general_ci	32.0 KiB	-
ride_history	Browse Structure Search Insert Empty Drop	28	InnoDB	utf8_general_ci	48.0 KiB	-
users	Browse Structure Search Insert Empty Drop	5	InnoDB	utf8_general_ci	48.0 KiB	-
7 tables	Sum	56	InnoDB	utf8_general_ci	256.0 KiB	0 B

And this is the structure for every table:

Admin Table:

	admin_id	admin_name	admin_pass	admin_email	admin_verify	admin_approve
Edit Copy Delete	17	admin2	40bd001563085fc35165329ea1ff5c5ecbdbbeef	s11923626@stu.najah.edu	63642	1
Edit Copy Delete	22	Admin	7c4a8d09ca3762af61e59520943dc26494f8941b	admin@gmail.com	80264	1

Cards Table:

	card_id	card_users_id	card_number	card_cvv	card_exp	card_holder
Edit Copy Delete	7	26	3222 2558 0547 8633	123	05/25	bara sawafta
Edit Copy Delete	8	29	9876 6454 4454 5455	123	05/24	Yousef

Car Informations Table:

	car_id	car_location	car_type	car_company	car_model	car_number	car_color	car_doc	car_driver_id
Edit Copy Delete	14	Nablus	Economy	Ford	2018	686767	Red	11700a86b3c9-bbe3-4ebd-b4ad-fa1a59e947a11816951816...	32
Edit Copy Delete	15	Ramallah	Economy	Kia	2019	123431431	Red	1095544aa2d4-23e1-4308-899d-efe31c89eba97031141560...	33
Edit Copy Delete	16	Nablus	Middle	Ford	2017	123123	Red	6573af9c3cac-e1a0-44da-b770-194d8242efa56588630121...	34
Edit Copy Delete	17	Nablus	Middle	VolksWages	2016	2147483647	Black	5310994da239-13e4-4f5e-aa8d-4b021efa3bac5960197731...	35

Comments Table:

	comment_id	comment_date	comment_user_id	comment_info	comment_rating	comment_driver_id
Edit Copy Delete	11	2023-12-31 17:08:44	5	why this is happenin	2	13
Edit Copy Delete	12	2024-01-01 14:54:14	6	abo Irshaid is here	3.5	13
Edit Copy Delete	14	2024-01-09 16:16:07	28	do not requst this driver	4.5	14
Edit Copy Delete	15	2024-01-25 17:39:12	26	hola	2	12
Edit Copy Delete	16	2024-01-25 17:39:19	26	ad	2	12
Edit Copy Delete	17	2024-01-25 17:39:27	26	aaa	2	12

Drivers Table:

+ Options

	drivers_id	drivers_email	driver_password	drivers_name	drivers_phone	drivers_photo	drivers_lat	drivers_long	drivers_availability	drivers_verfiyCode	drivers_verfiy	drivers_adminApprove
Edit Copy Delete	9	abc.a.aa	40bd001563085fc3	taha	+9702345678	36765dd89356-bbe3-4fcf-a895-c267a1224beb8724	37.41925	-122.07804	0	12345	1	1
Edit Copy Delete	10	123@d.d	40bd001563085fc3	Rashad Ahmad	+9701234567	9701ddd.jpg	37.41064	-122.07319	0	12345	0	1
Edit Copy Delete	12	aa@dd.con	40bd001563085fc3	kazkaz	+9702840494	4797f99977c8-4842-4854-9221-ef3a33efac9f766737	37.4230901	-122.0820162	0		1	1
Edit Copy Delete	13	ah@gmail.com	40bd001563085fc3	ahmed mohsen	+9702840499	17594477ae99-57fc-4257-b631-bbce2883c0b13617-	37.41925	-122.07804	1		1	1

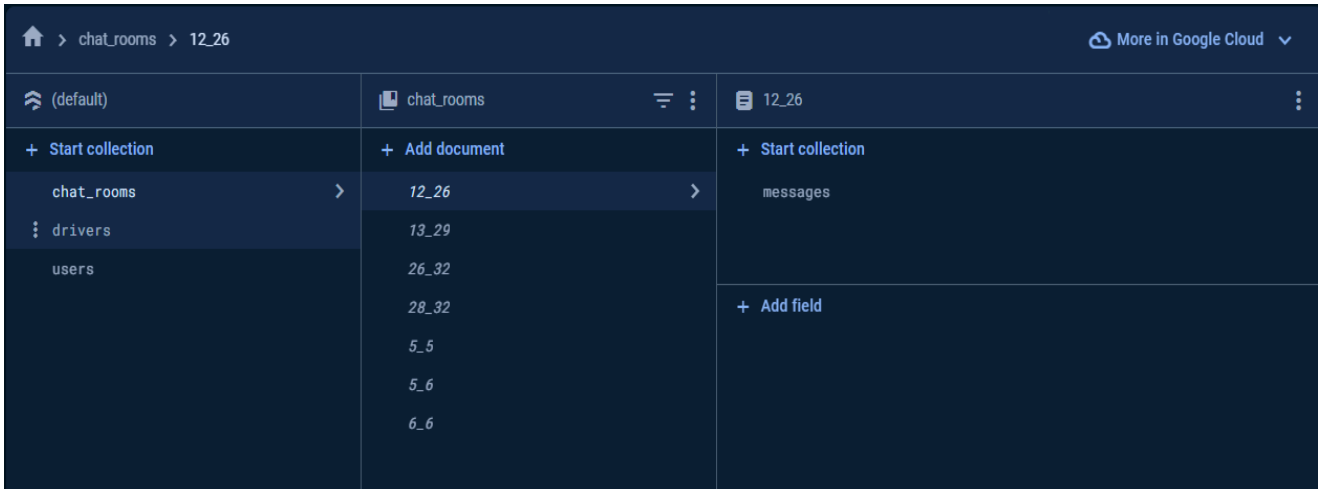
Ride History Table:

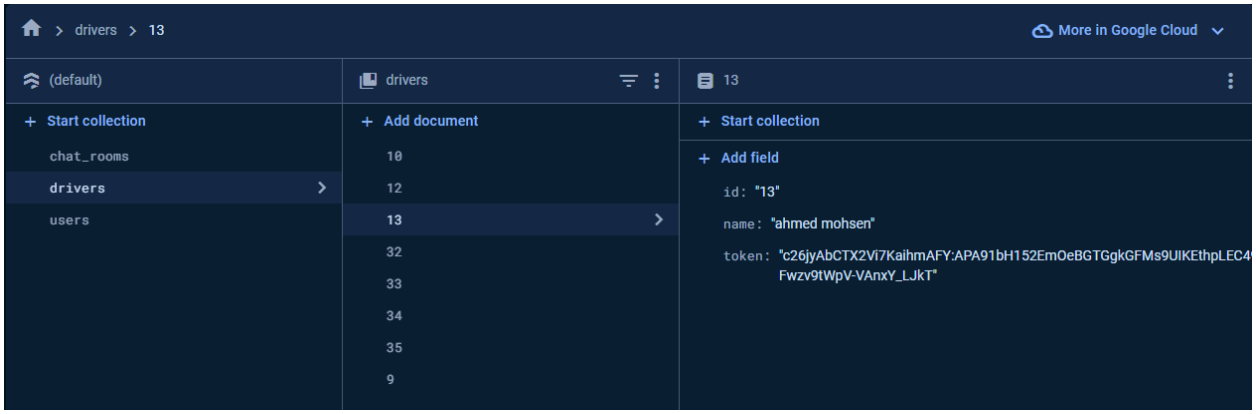
	ride_history_id	ride_history_uid	ride_history_src	ride_history_dst	ride_history_time	driver_id	driver_approved
Edit Copy Delete	13	26	Tubas	Nablus	2024-01-25 12:11:04	12	1
Edit Copy Delete	30	26	Tubas	Haifa, Israel	2024-01-25 07:24:28	13	1
Edit Copy Delete	31	26	Ramallah	Bethlehem	2024-01-25 07:13:53	12	1
Edit Copy Delete	32	26	Nablus	Jenin	2024-01-25 05:40:01	0	0
Edit Copy Delete	34	26	Nablus	Ramallah	2024-01-25 10:39:23	12	0
Edit Copy Delete	47	26	Ramallah	Nablus	2024-01-25 16:42:46	12	1
Edit Copy Delete	48	26	Haifa, Israel	Nablus	2024-01-25 14:55:54	12	0
Edit Copy Delete	49	26	Haifa, Israel	Nablus	2024-01-25 16:56:34	12	1
Edit Copy Delete	50	26	Nablus	Tubas	2024-01-25 19:08:24	12	1
Edit Copy Delete	51	26	Nablus	An-Najah National University, Nablus	2024-01-28 10:32:35	12	0

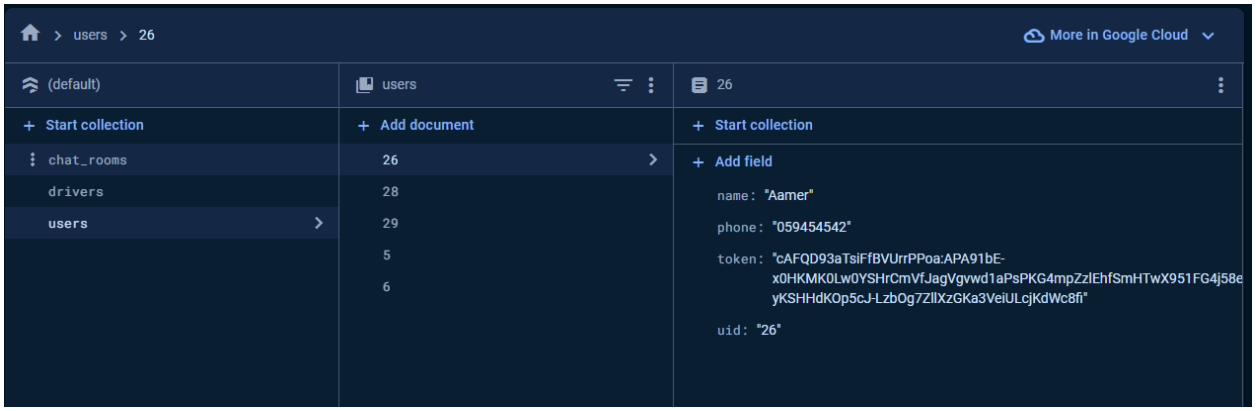
Users Table:

	users_id	users_name	users_password	users_email	users_phone	users_verifycode	users_approve	users_create	users_photo	users_lat	users_long
Edit Copy Delete	5	mahmoud kazlak	40bd001563085fc351f	a@a.aaa	0539856478	15303	0	2023-12-28 20:21:42	6195sand-crain-8jk64drEMcw-unsplash.jpg	0	0
Edit Copy Delete	6	Mostafa	601f1889667efaebb33	jj@jj.com	0599318274	0	0	2024-01-01 16:38:37		0	0
Edit Copy Delete	26	Aamer	eb7a31664085f95f617	barasawafta2012@gmail.com	059454542	46295	1	2024-01-05 17:14:06	2000189ce8a9-002a-4502-9e47-413a109df50059	null	null
Edit Copy Delete	28	Ahmad	601f1889667efaebb33	yaserkharouf4@gmail.com	059454545	52659	1	2024-01-05 17:38:29		37.41568	-122.07817
Edit Copy Delete	29	Yousef	601f1889667efaebb33	yousef@ymail.com	059897654	28364	1	2024-01-29 13:08:24		null	null

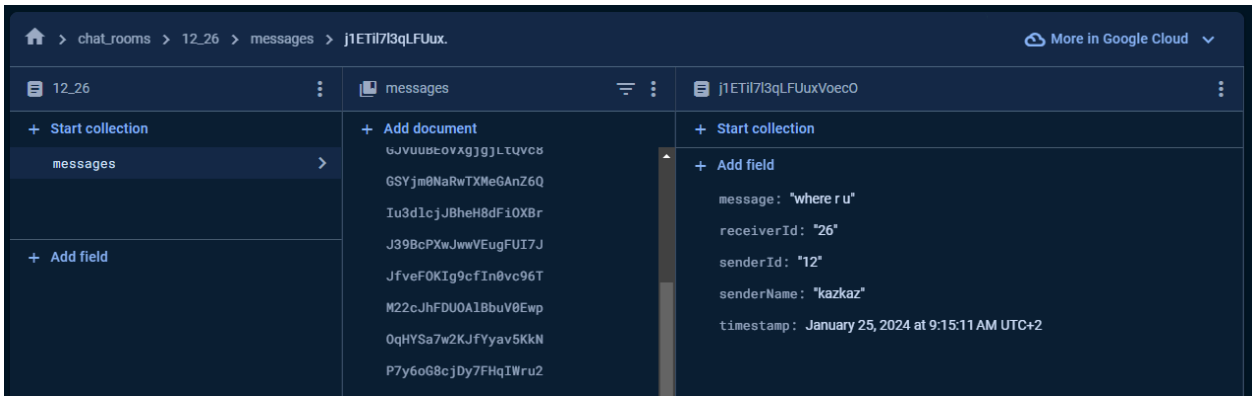
And this is the firestore database that we used for real time chatting and notification :







This is example of storing the chat messages in the firestore



4.2 Admin Dashboard and Mobile Application

4.2.1 Admin Dashboard

The following figures represents the admin site first the admin should create a new account if he doesn't have one and then he will receive a verification code using his email to verify himself and then he should enter the verification code in the verification screen, and the admin can handle users and drivers data, the admin receives approvement requests from drivers and can approve them, there is a broadcast message feature that allows the admin to send a message to all drivers, also the admin can check some statistics about most visited destinations and sources.

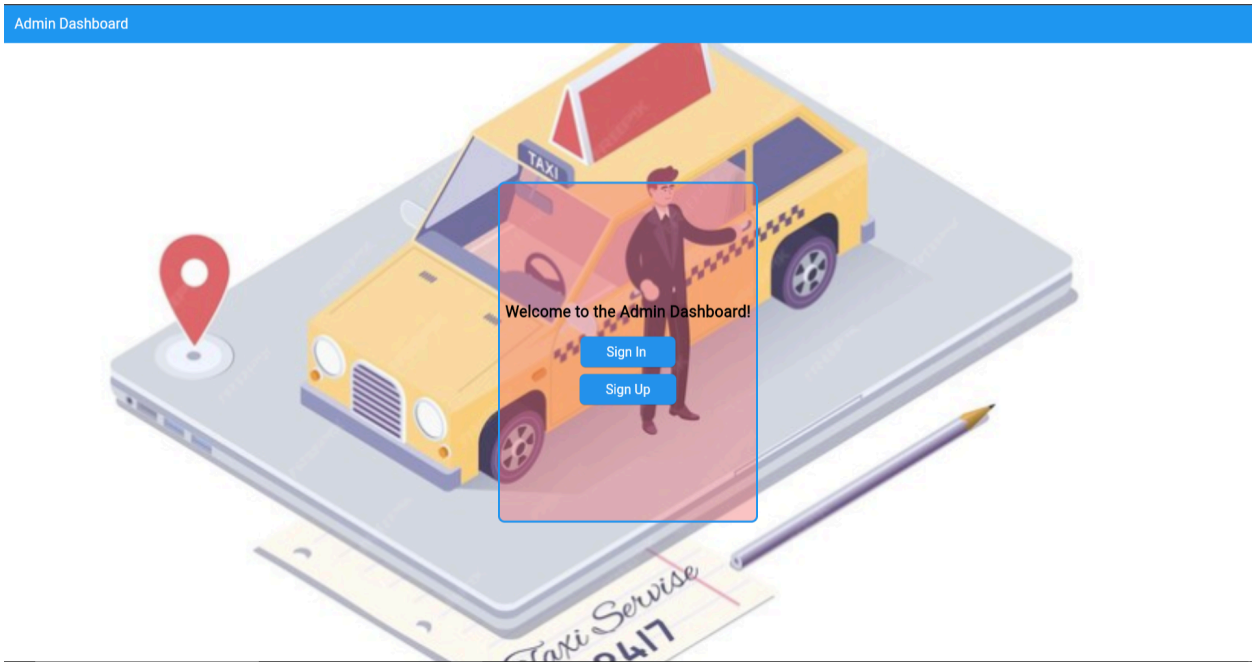


Figure1: Admin Dashboard

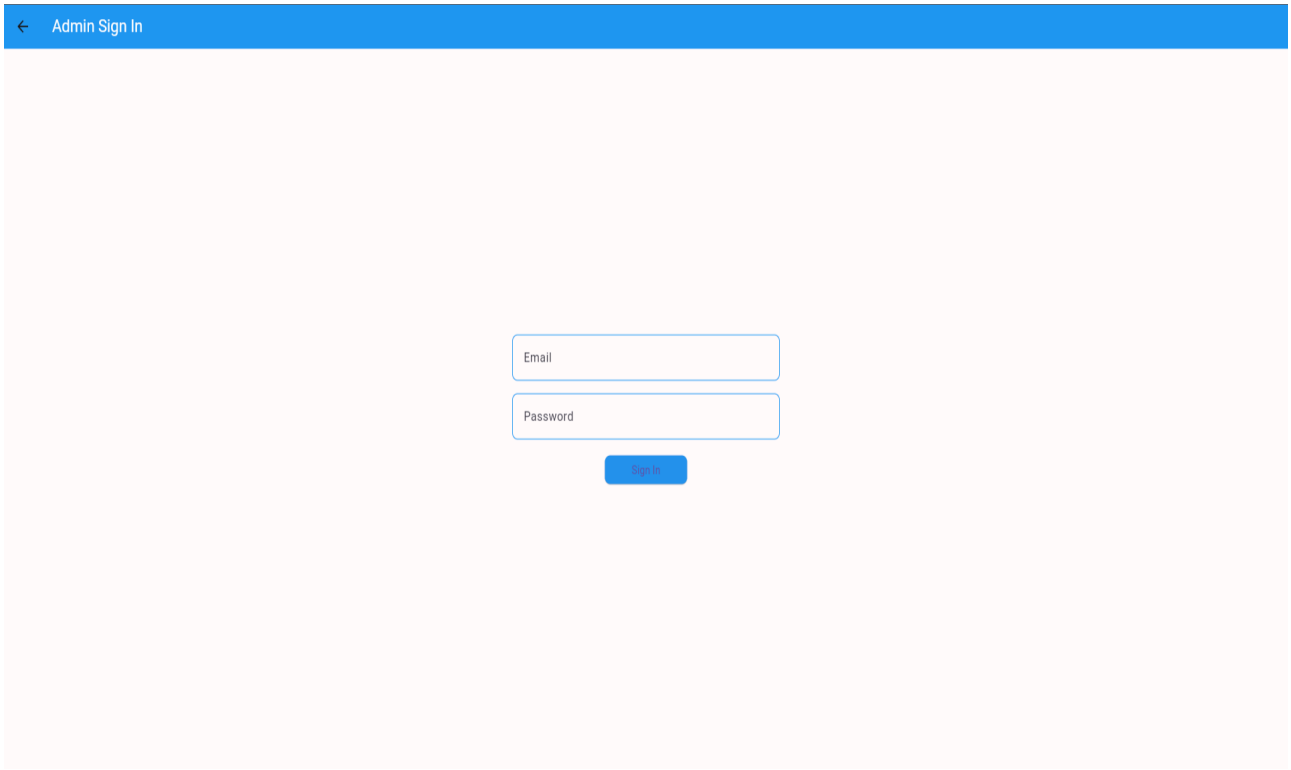


Figure2: Admin Sign In

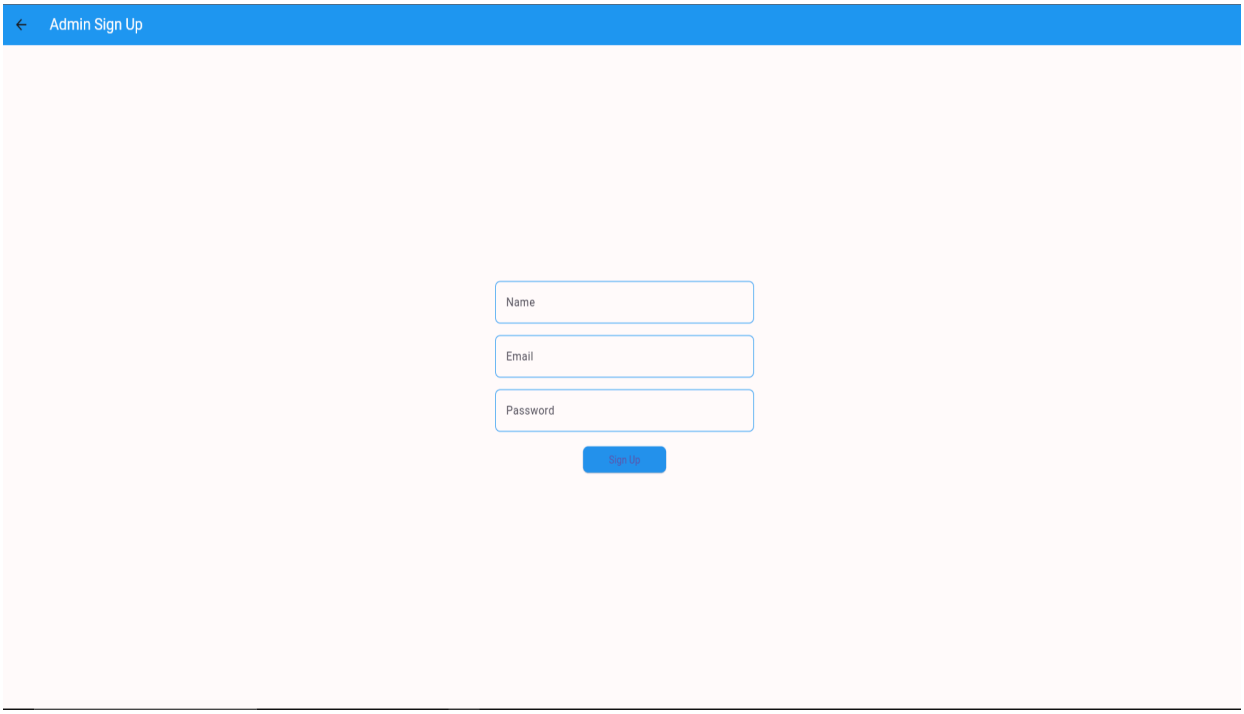


Figure 3: Sign-up

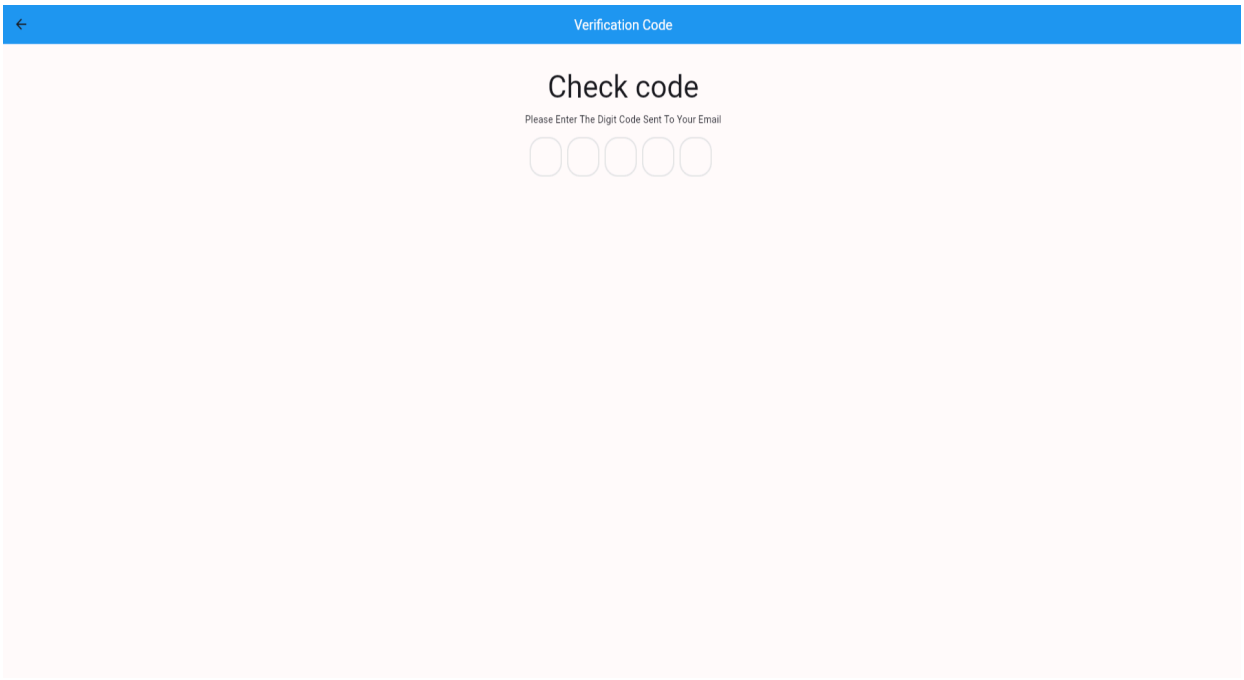


Figure 4: Verification code

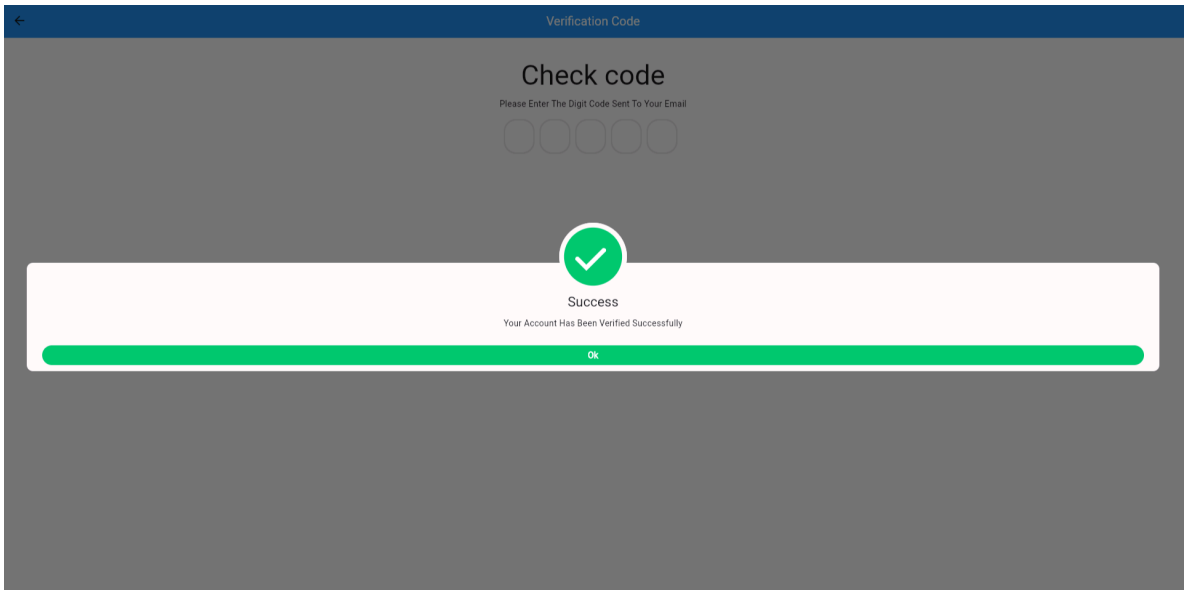


Figure 5: Verification code success

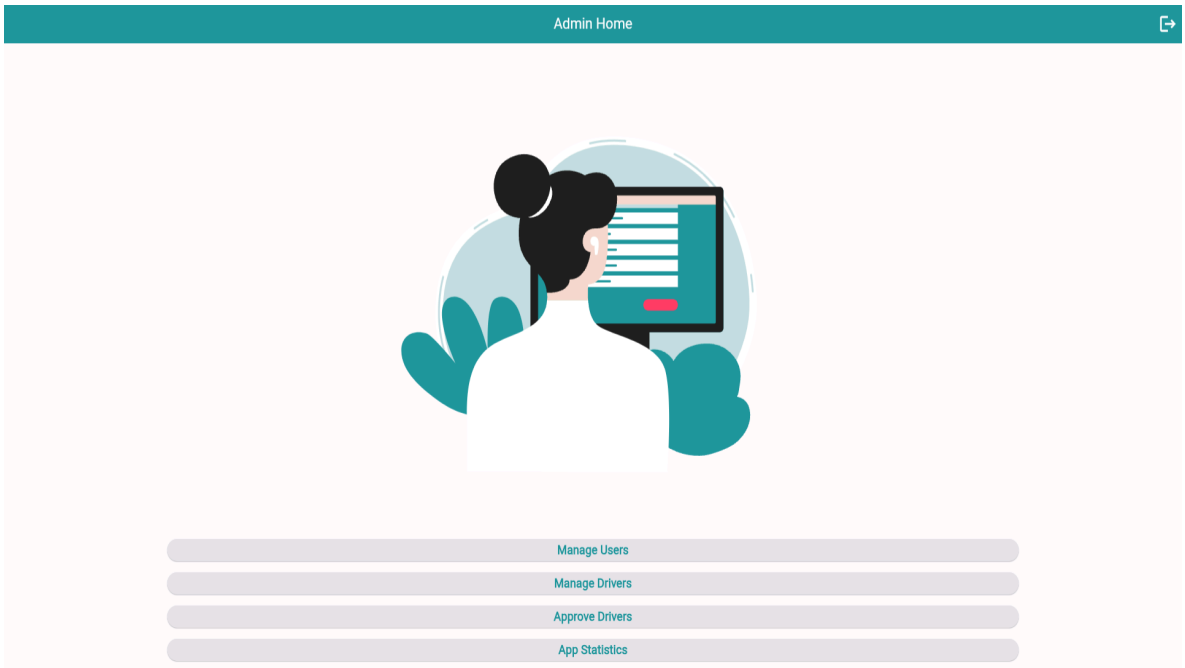


Figure 6: Admin Homepage

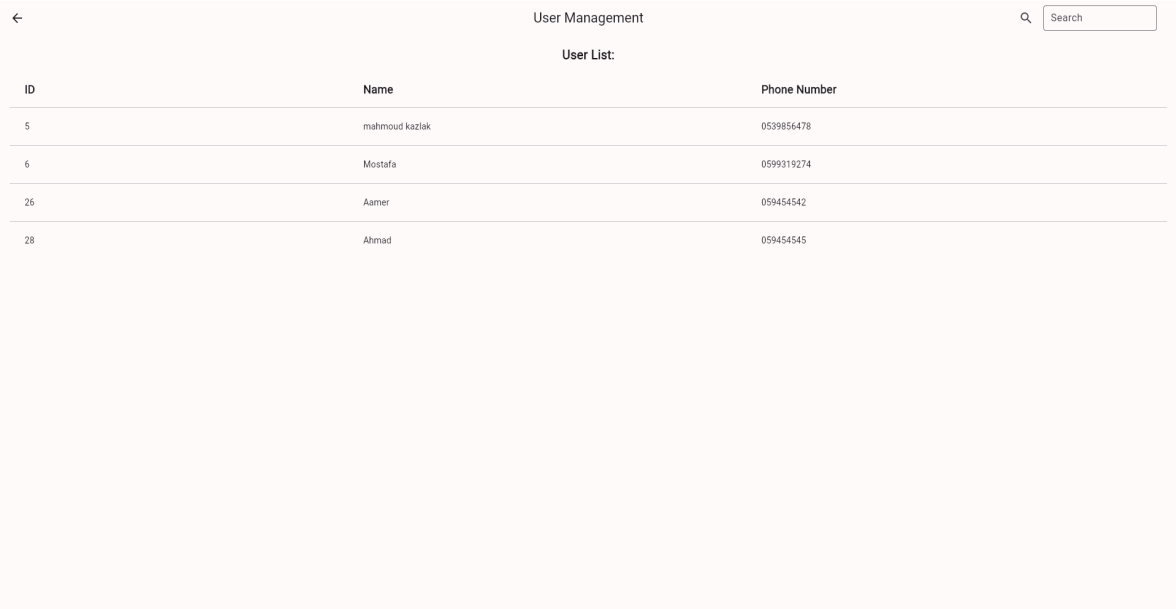


Figure 7: User Management

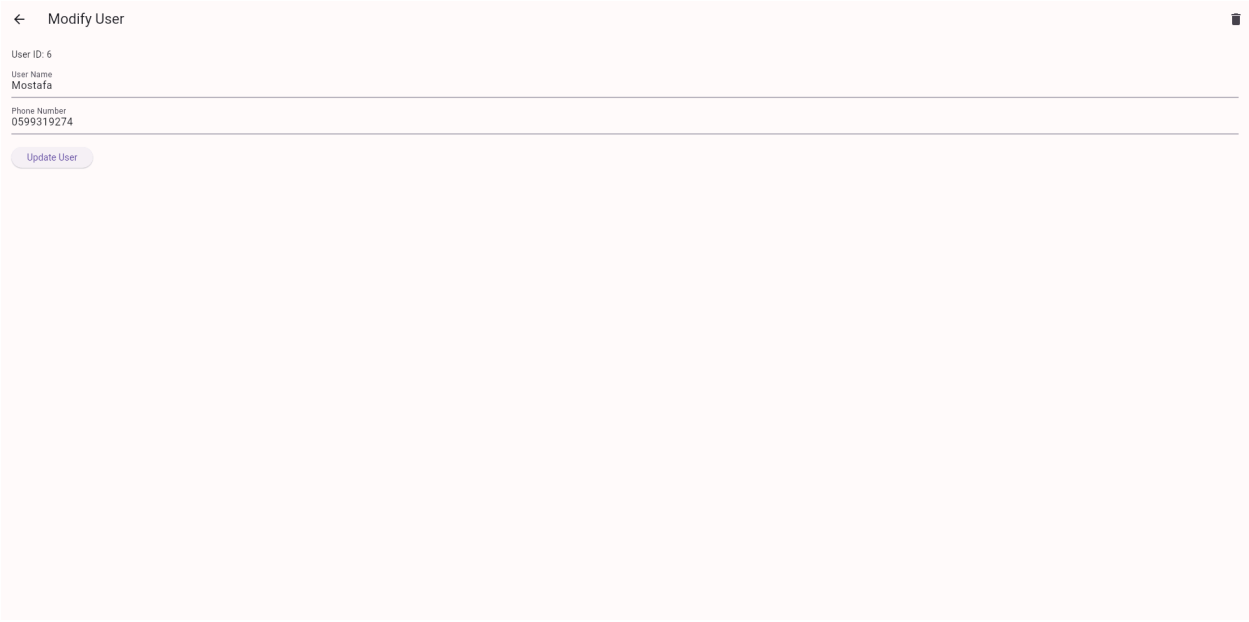


Figure 8: Modify User

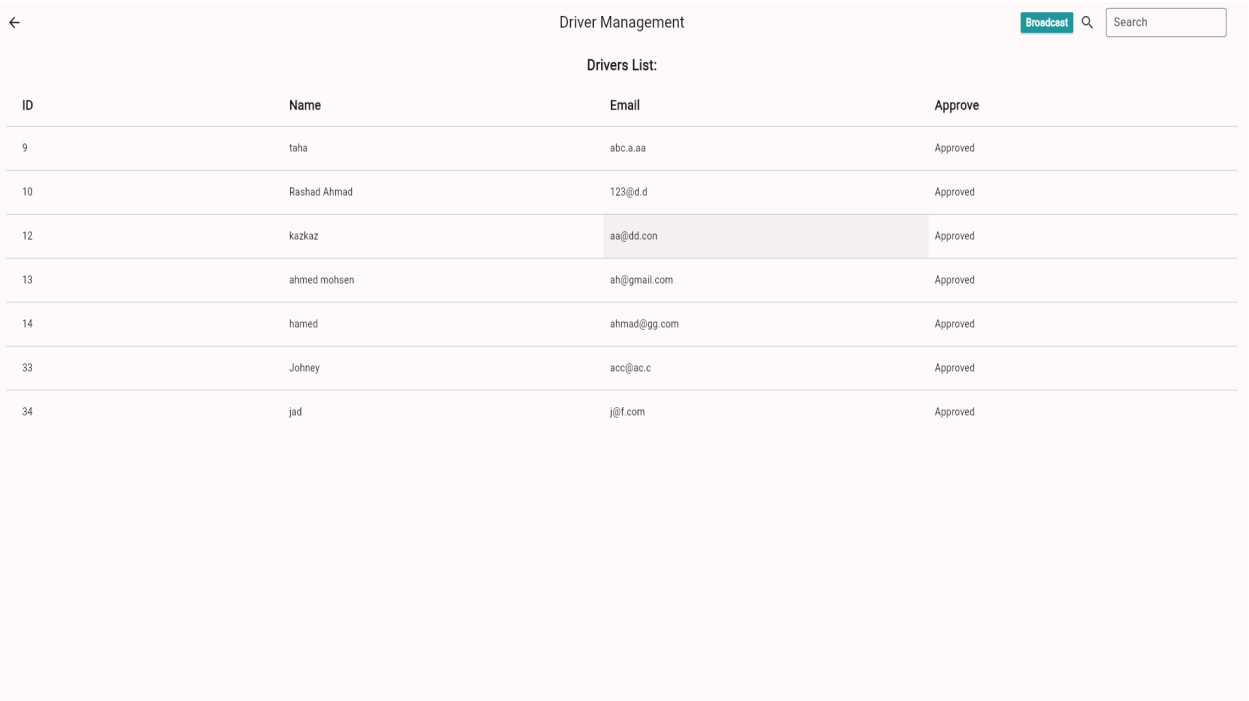


Figure 9: Approved Drivers Management

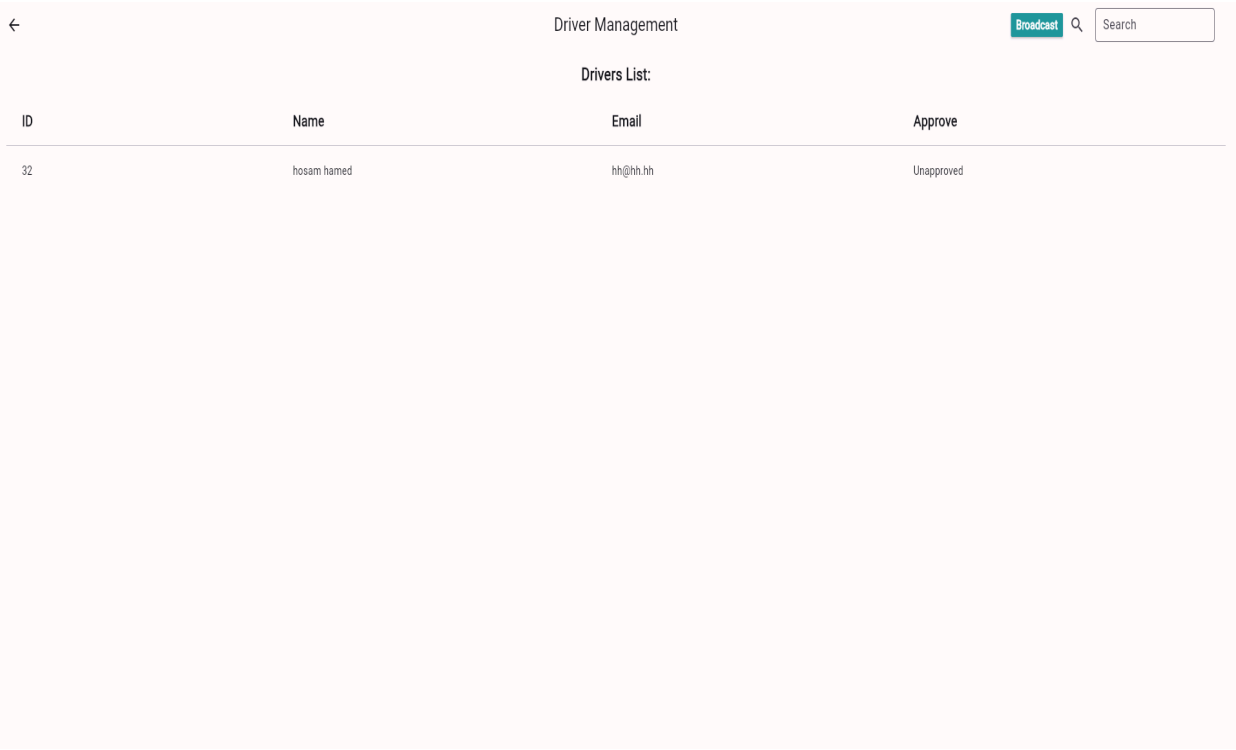


Figure 10: Unapproved Drivers Management

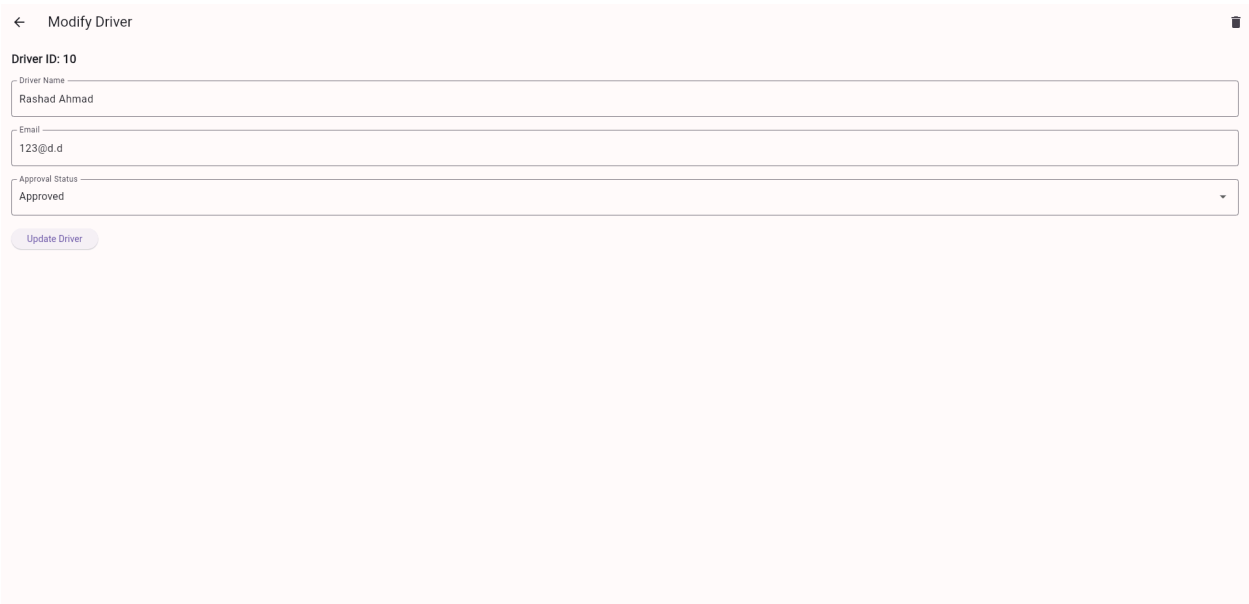


Figure 11: Modify Driver

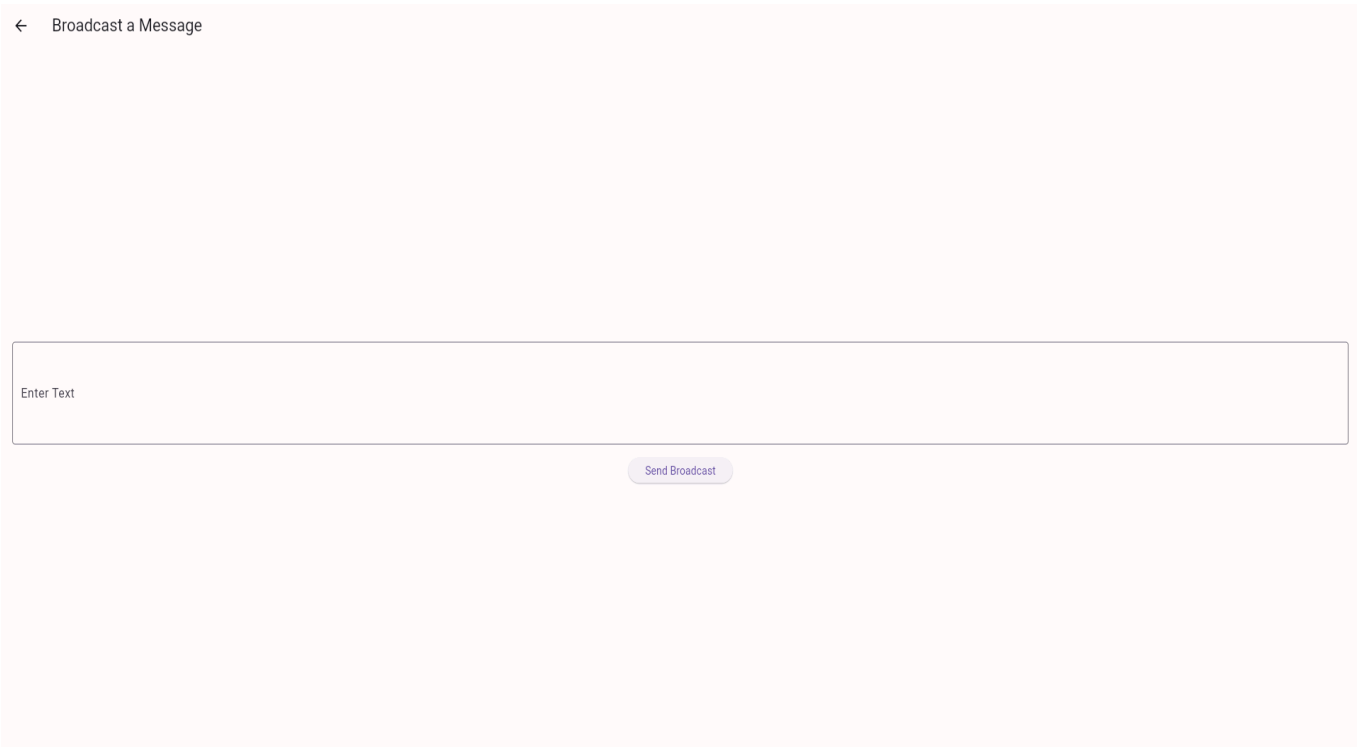


Figure 12: Broadcast a Message to the drivers

Figure 13: Location Statistics

4.2.2 Mobile Application

4.2.2.1 Mobile Application From The User Side

Now we will present the mobile application:

Figure 14 talks about the languages where the user have the ability to choose his preferred language:

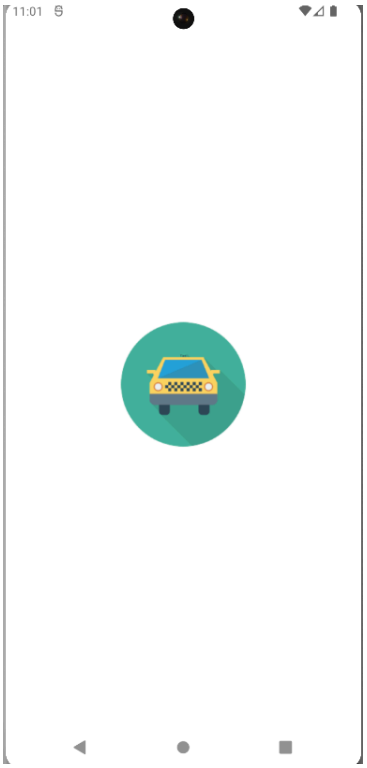


Figure 14 :application logo

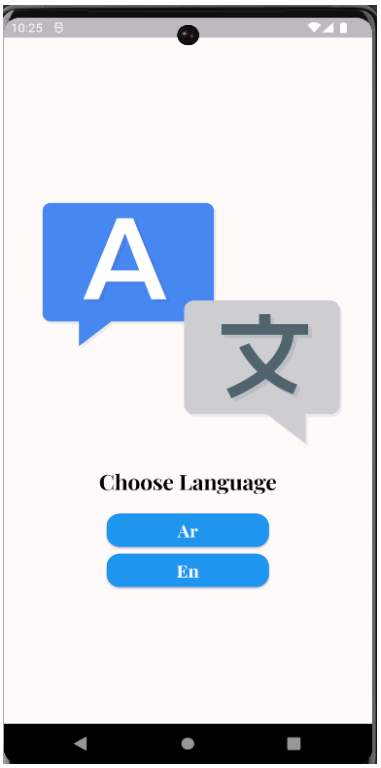


Figure 15: Language Screen

Figures 16,17,18 talks about the onboarding screens that gives a hint about the app and what both the user and the driver will gain from using it.

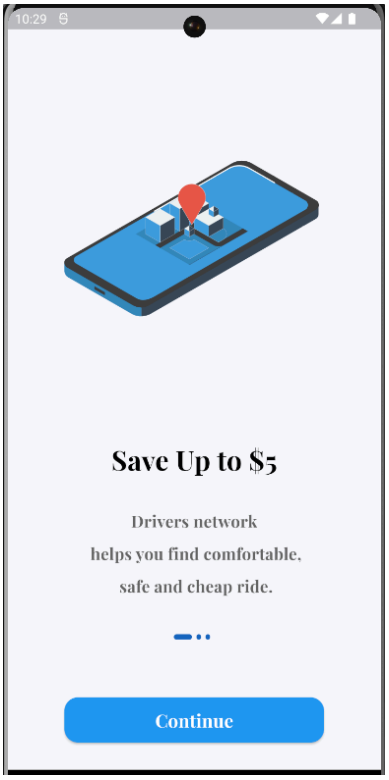


Figure 16:Onboarding screens

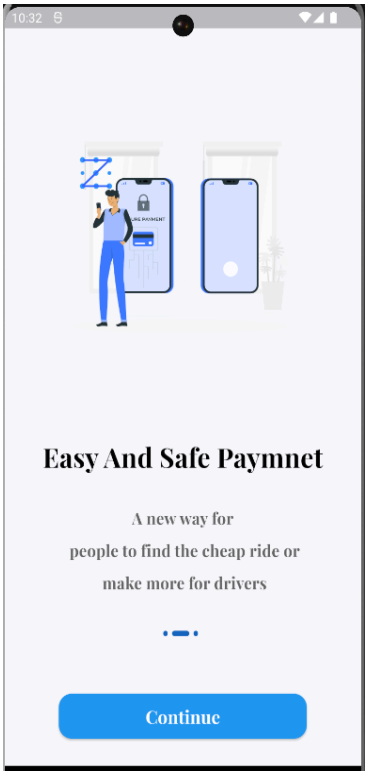


Figure 17:Onboarding screens

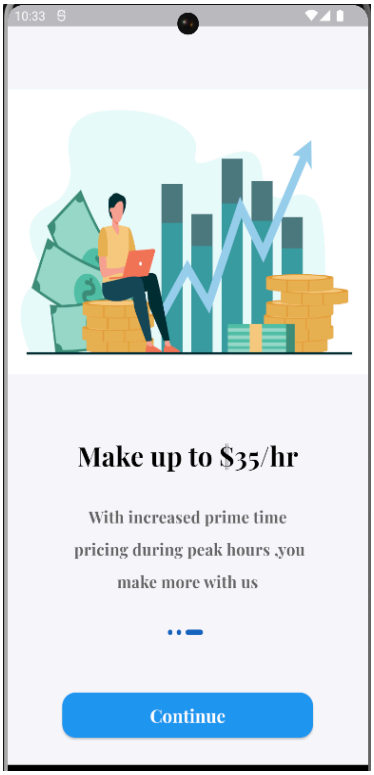


Figure 18: Onboarding Screens

Figure 19 : Decision screen

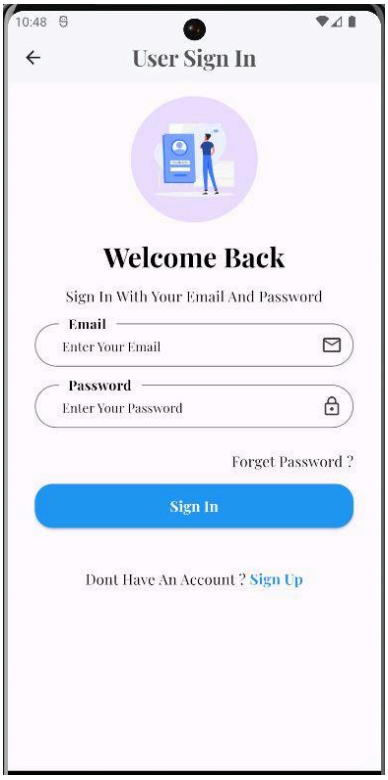


Figure 20 : User SignIn

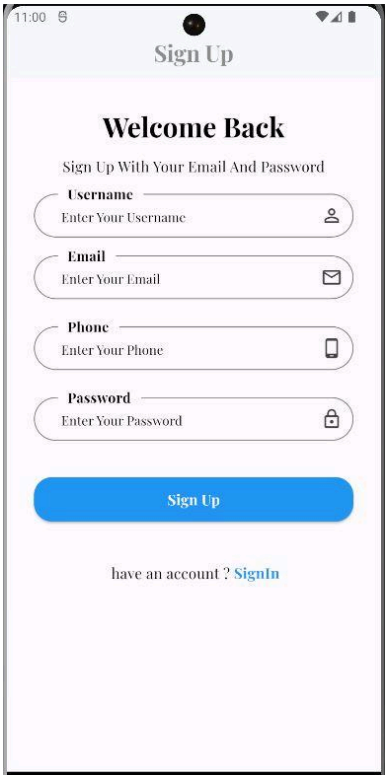


Figure 21: User SignUp

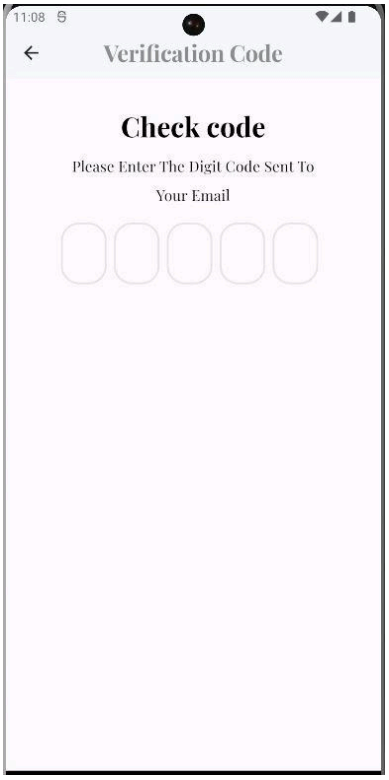


Figure 22: OTP verification

Figure 23: Success Verification

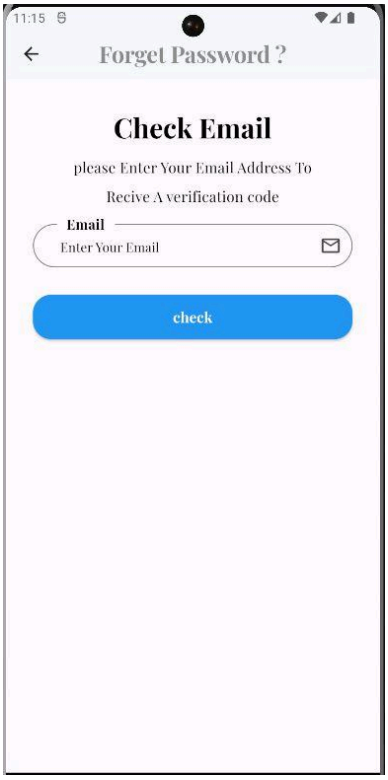
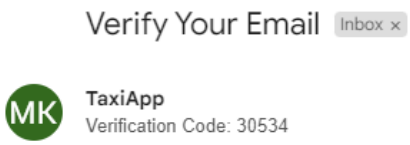


Figure 24: Forget Password

The user will receive his verification code through the email like this:



In figure 24 the user should enter his email and then he will receive a verification code through his email and then he will enter it and if it is true he will go to the reset password screen where he will enter the new password.

Figure 25 shows the user home screen where the user can choose the source address and the destination address.
Figure 26 appears when the user wants to choose his source address where the user chooses the pick up address his current location or he will search for another address.

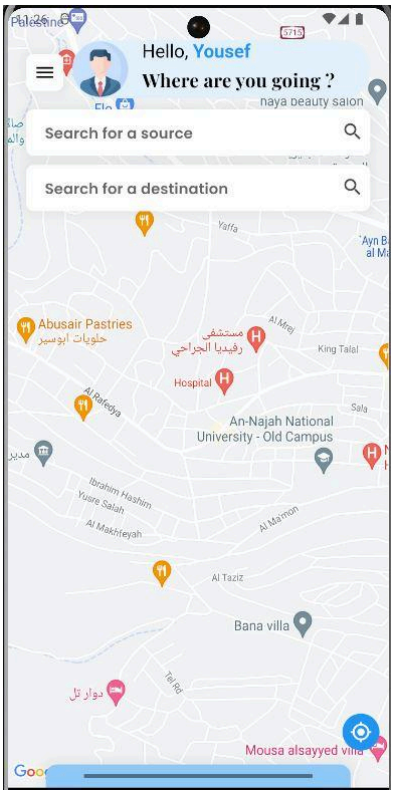


Figure 25: User Home Screen

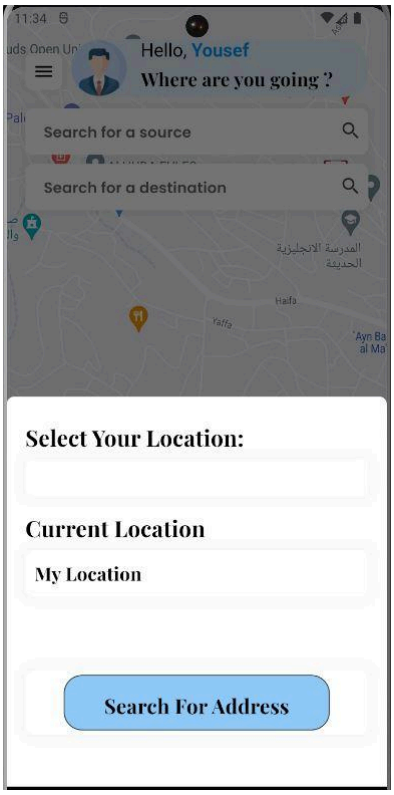


Figure 26:choosing source address

Figure 27 : after the user selects both source and destination addresses this screen appears which have the available drivers, and there are two buttons the first one is the check button and if the user clicks on it then he can see the comments and the rating for the driver as shown in figure 28.

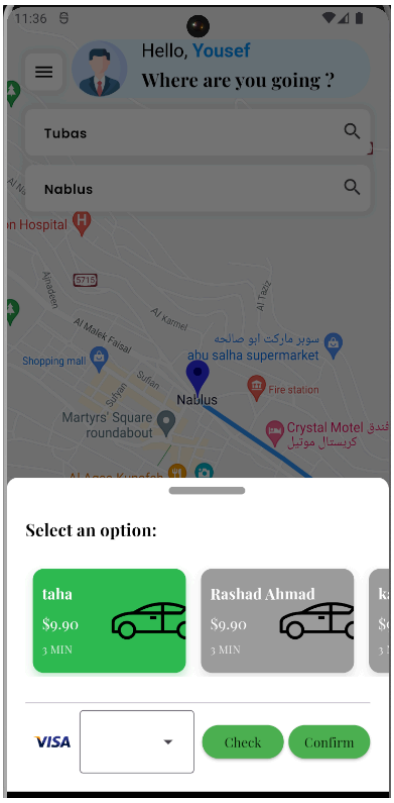


Figure 27:Available drivers

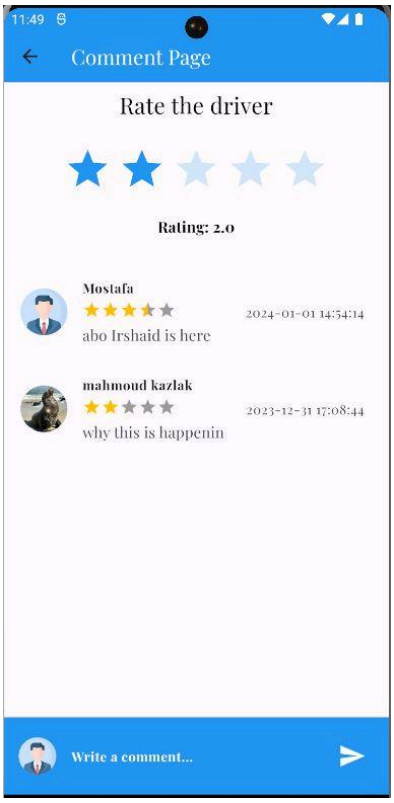


Figure 28:Comments and ratings

And if the user clicks on the confirm button then a notification will goes to the driver that the user chose to inform him that there is someone waiting for your response as shown in figure 29.

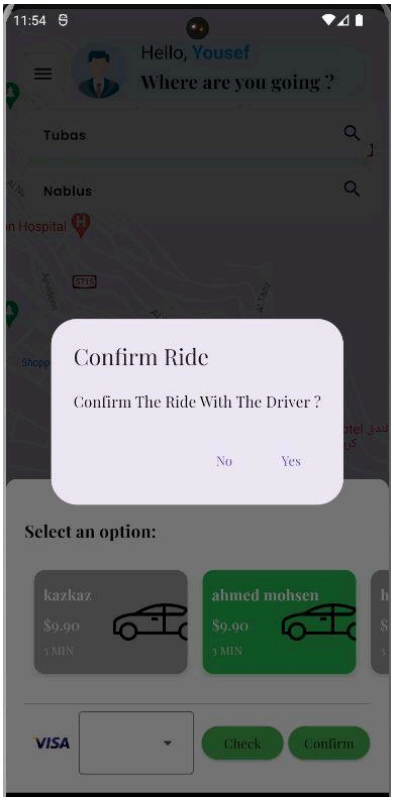


Figure 29: Confirm Ride

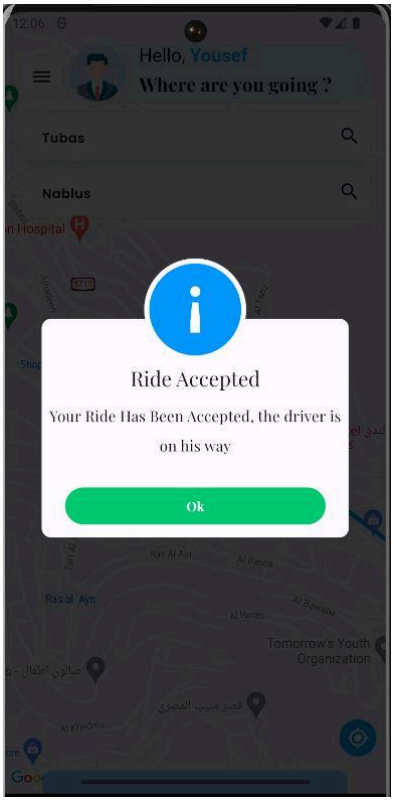


Figure 30:Ride Accepted

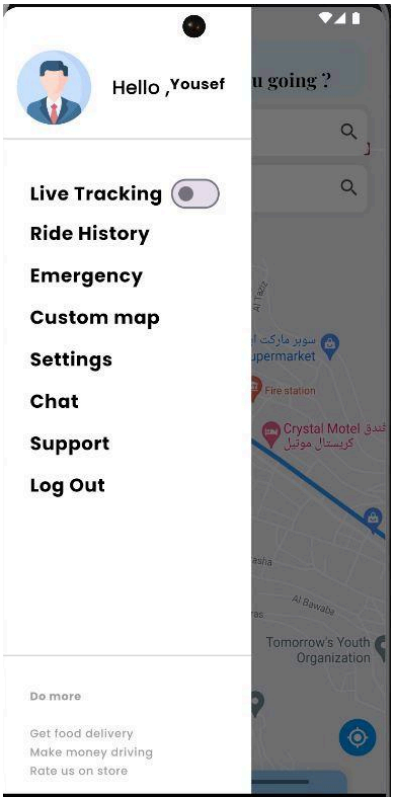


Figure 31: User Drawer

Figure 30 shows what appears to the user if the driver accepts his request.

Figure 31 is the user drawer where the user has some customizations as shown.

Figure 32 shows the ride history for the user from the latest ride to the oldest, also every ride history has a button in it where the user rates and adds a comment for the driver that he chose during that ride.

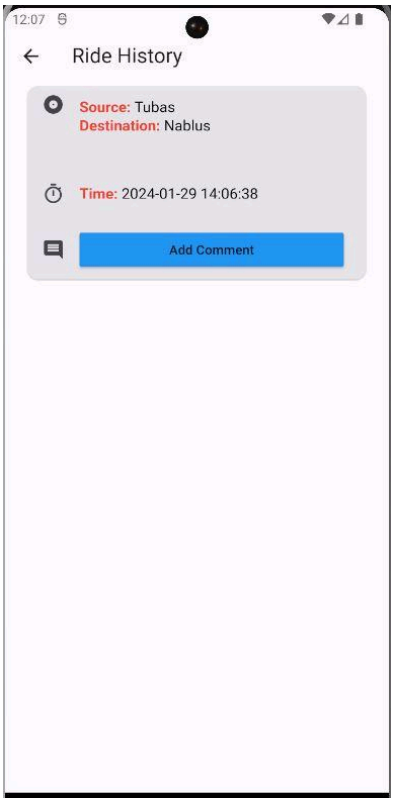


Figure 32:Ride History

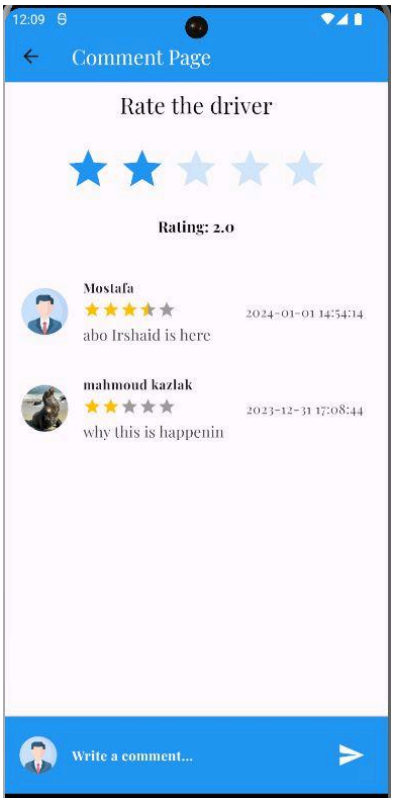


figure 33:Comment From Ride History

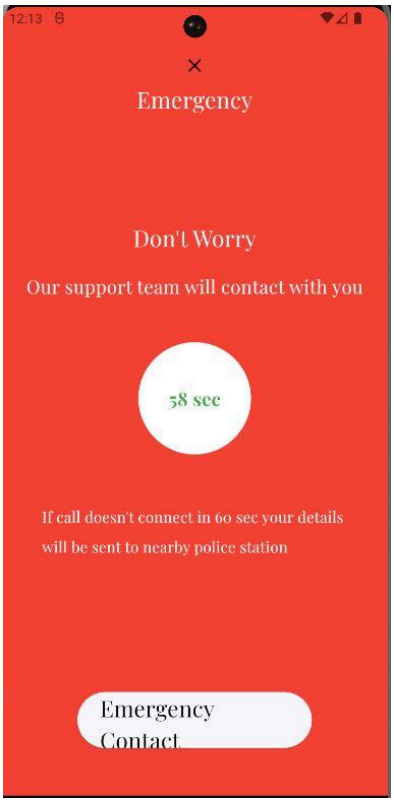


figure 34:Emergency Screen.

Figure 35: Custom map

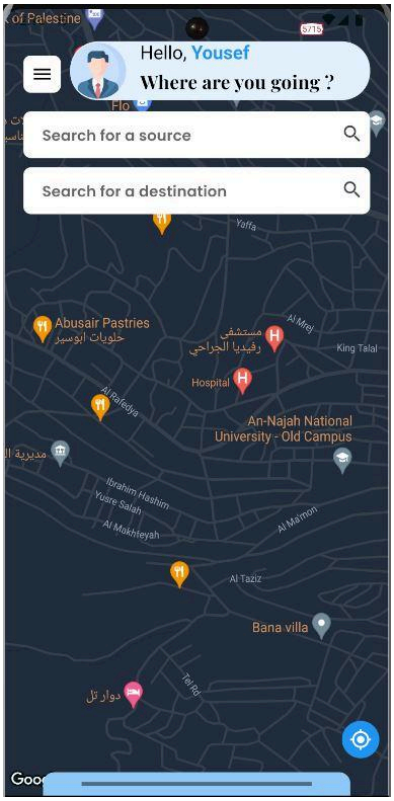
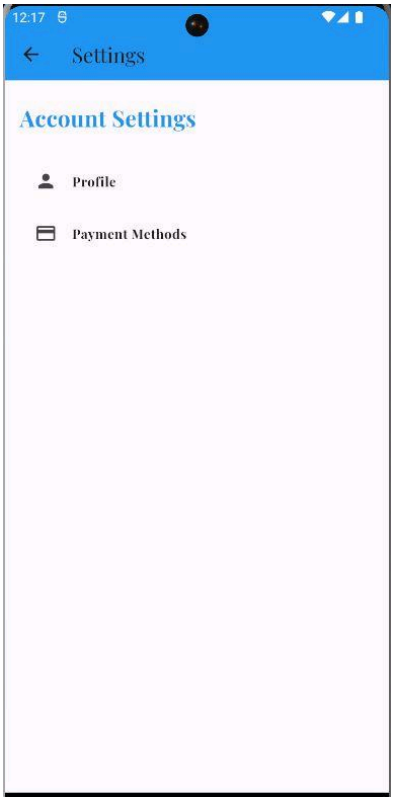
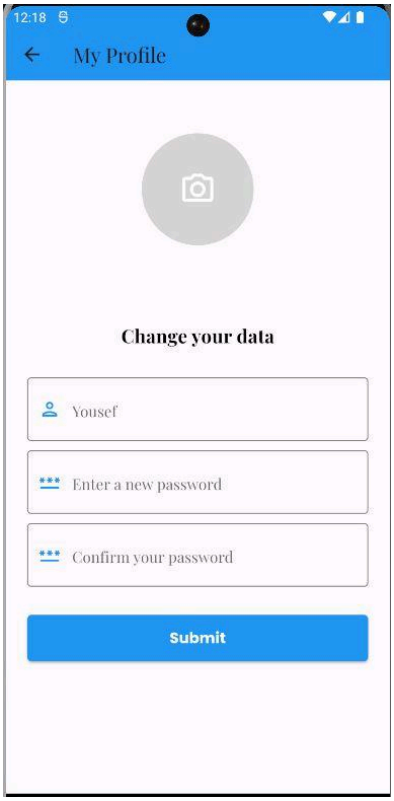


Figure 36: Night theme

In figure 35: the user can choose his preferred map theme like here he choose night theme as shown in figure 36.





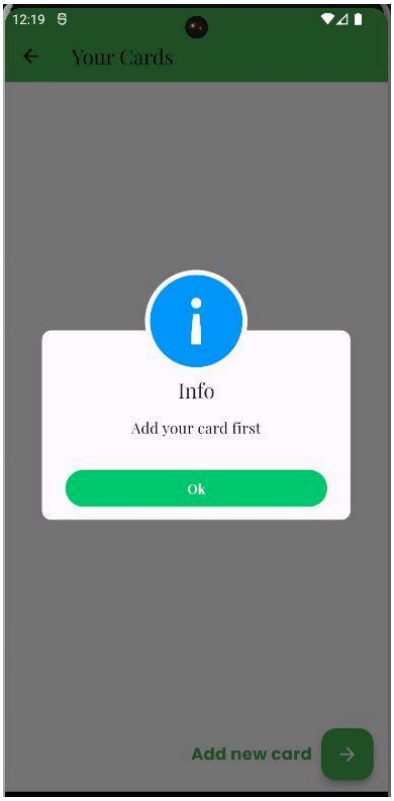


Figure 37 : Settings Page

Figure 38: Profile Settings

Figure 39:Payment method

Figure 37 shows the settings page where the user can update his profile as shown in figure 38 or the user can go to the payment screen where he can add his visa as shown in figure 39.

Figure 40:Cards Screen

Figure 41: Adding a Card

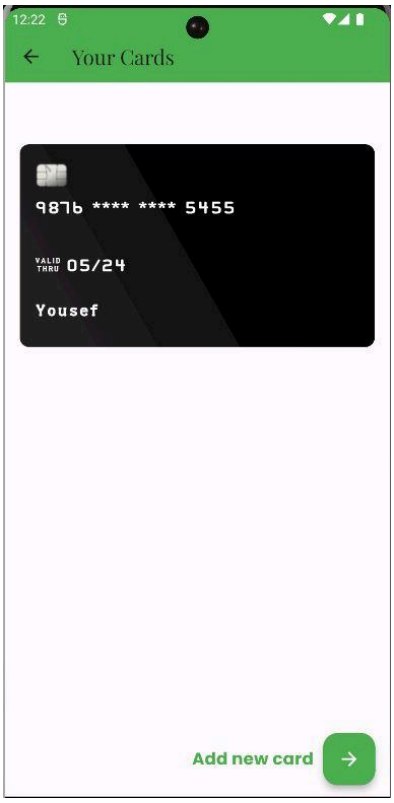


Figure 42 :Card added Successfully

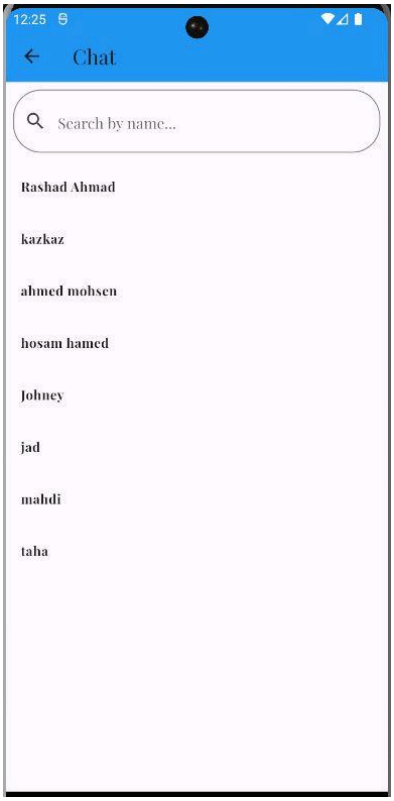


Figure 43 : chat Screen

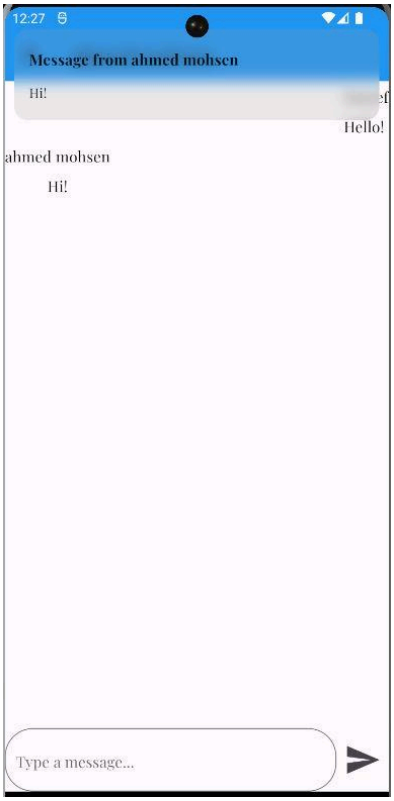


Figure 44 : User chat Screen

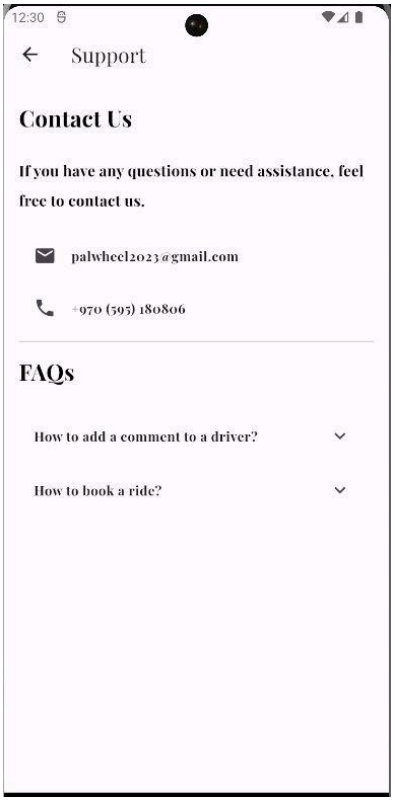


Figure 45 : Support Screen

4.2.2.2 Mobile Application From The Driver Side

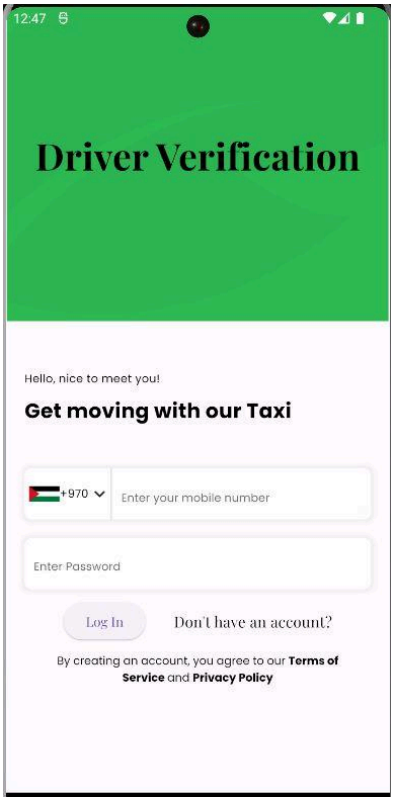


Figure 46 : Driver SignIn

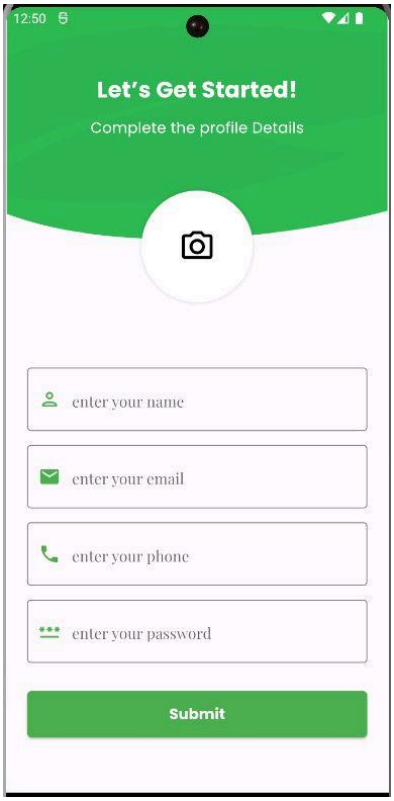


Figure 47 : Driver SignUp

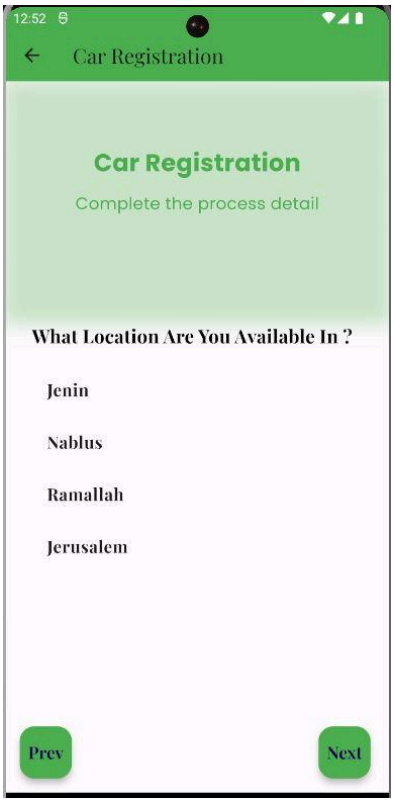


Figure 48 : Car Registration 1

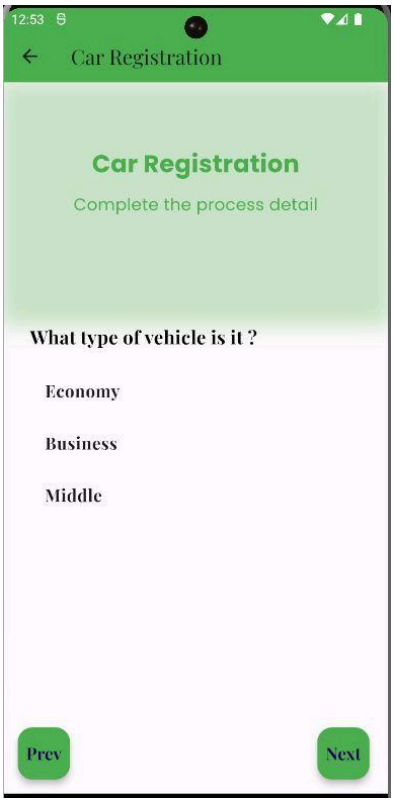


Figure 49 : Car Registration 2

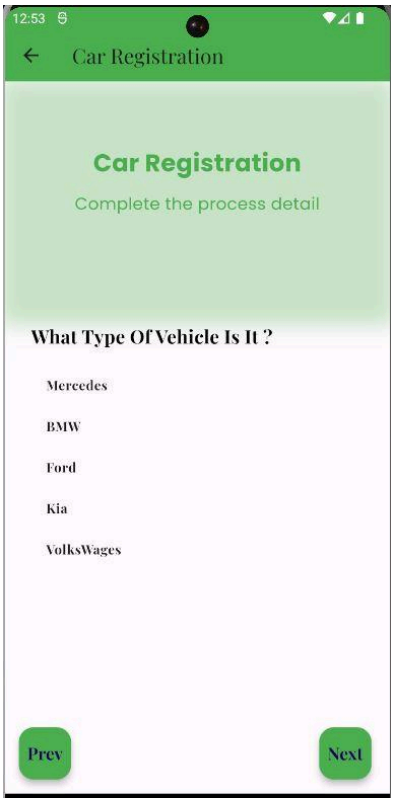


Figure 50: Car Registration 3

Figure 51 : Car Registration 4

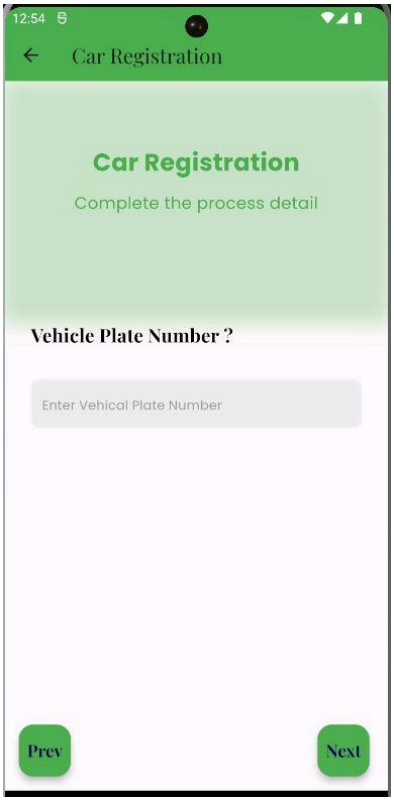


Figure 52 : Car Registration 5

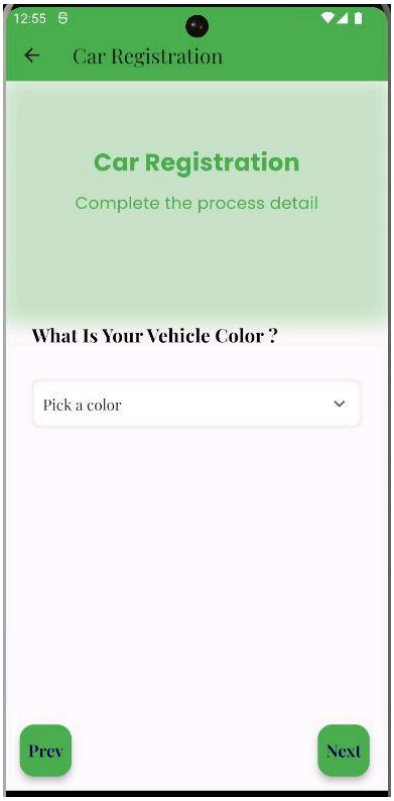


Figure 53 : Car Registration 6

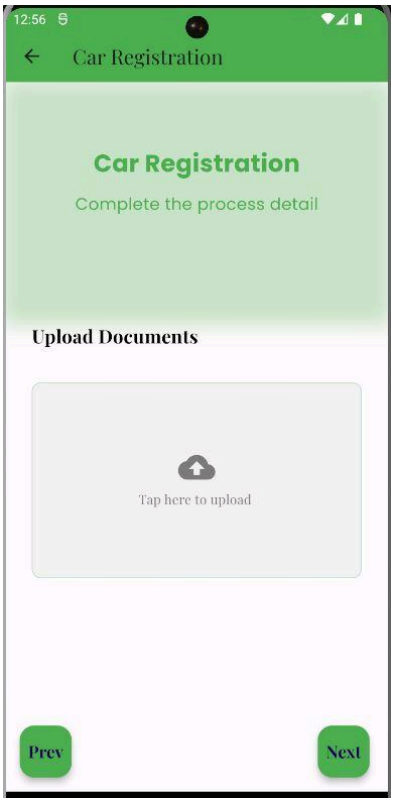


Figure 54 : Car Registration 7

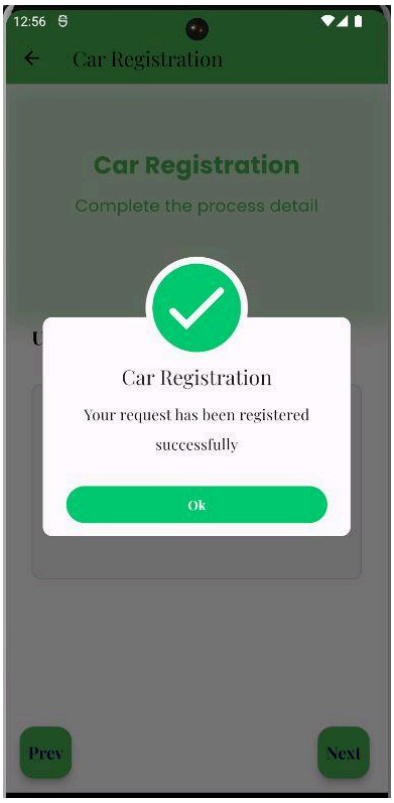


Figure 55 : Register Car Successfully

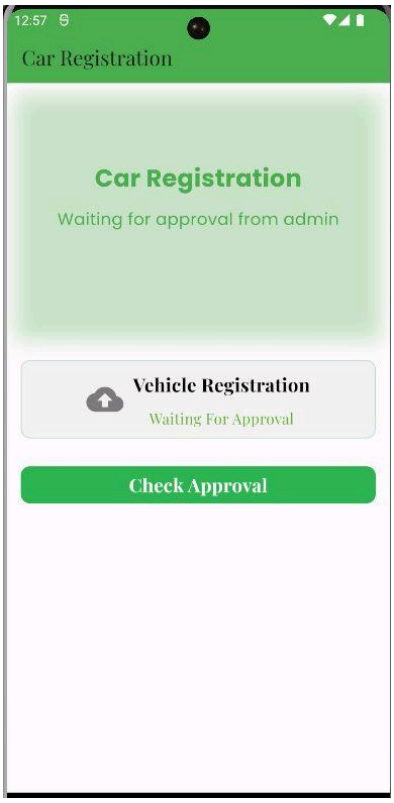


Figure 56 : Driver Waiting For Approval

Once the driver completes the car registration steps (as seen in figures 48-55), they move to a waiting screen (shown in figure 56). Here, the driver has to wait for approval from the admin. Each time the driver opens the app, they'll start at this waiting screen until the admin gives the green light. After approval, the driver can access their home screen. This process ensures that drivers undergo a confirmation step before fully accessing the app's features.

Figure 57 :Driver Home Screen

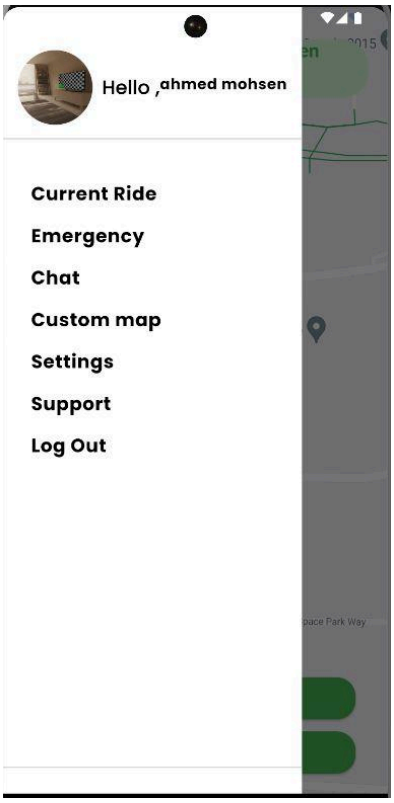


Figure 58 :Driver Drawer

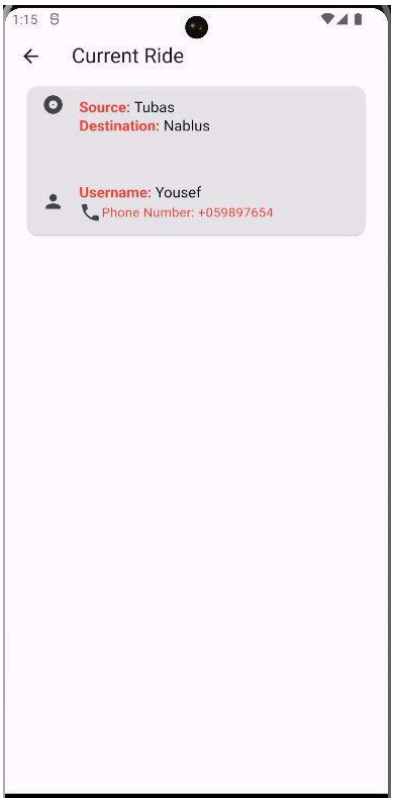


Figure 59: Current Ride

In figure 57, you can see the driver's home screen, featuring a map and two buttons. The first button allows the driver to make themselves available to users. When selected, users can then choose this driver to start a ride. The second button displays the driver's current location on the map, making it visible to users so they can track the driver. This layout enhances the driver's accessibility to potential riders and ensures a smoother user experience.

Figure 59 displays the screen where the driver can review the details of the last ride they accepted. This screen provides key information about the user and the trip, offering a quick overview of the recent ride. This feature allows the driver to stay informed about their recent activities.

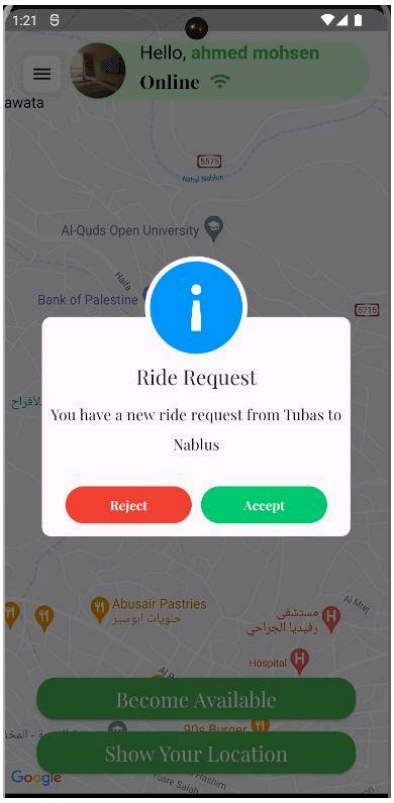


Figure 60 : ride request

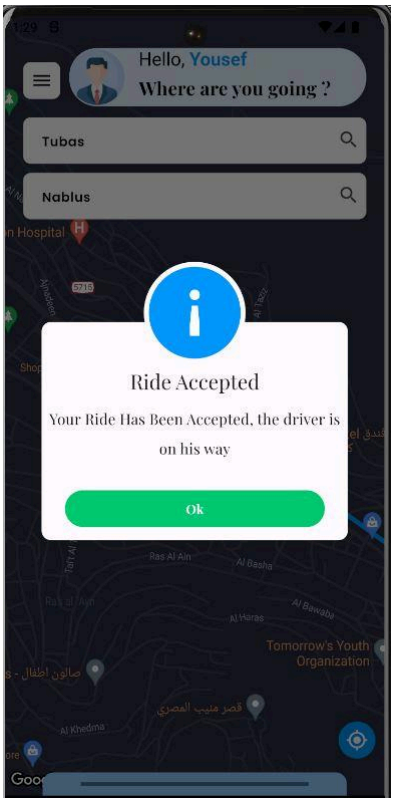


Figure 61: Ride Accept

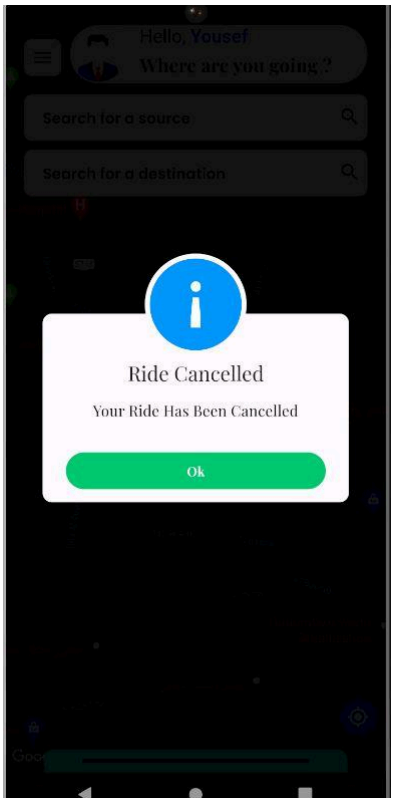


Figure 62 :Ride Rejected

In Figure 60, the illustration demonstrates the process when a user initiates a ride and selects a specific driver. A notification promptly appears on the driver's screen, signaling that a user is requesting to start a ride with them. The driver then has the option to either accept or reject the ride. Regardless of the driver's choice, a notification is sent to the user, ensuring they are promptly informed of whether the driver has accepted or declined the ride as shown in figures 61-62.

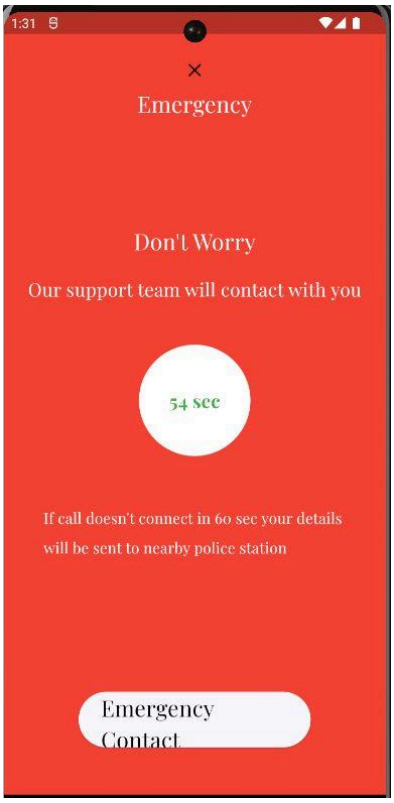


Figure 63 : Emergency Screen

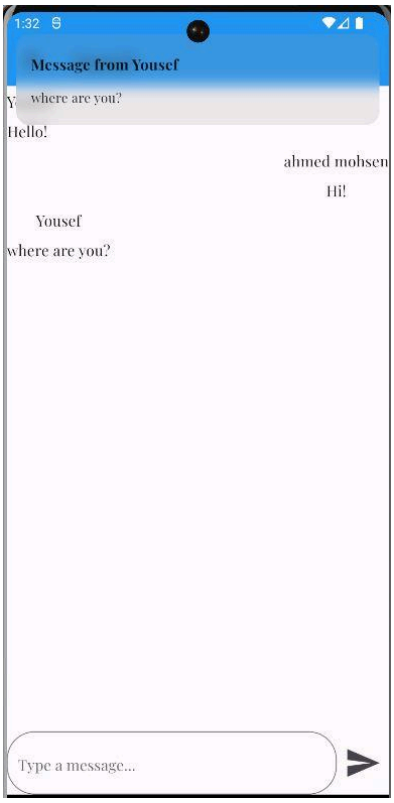


Figure 64 : Chat Screen

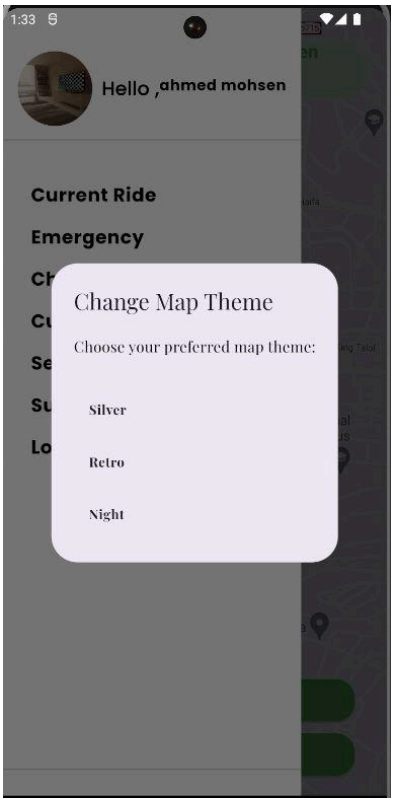


Figure 65 : Custom Map

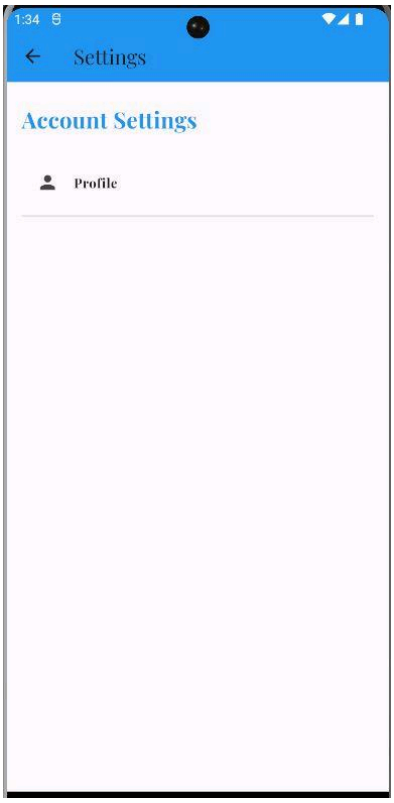


Figure 66 :Settings page

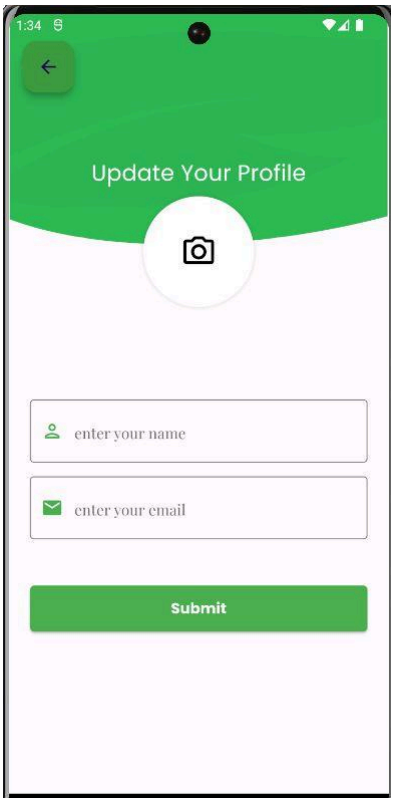


Figure 67 : Profile Settings

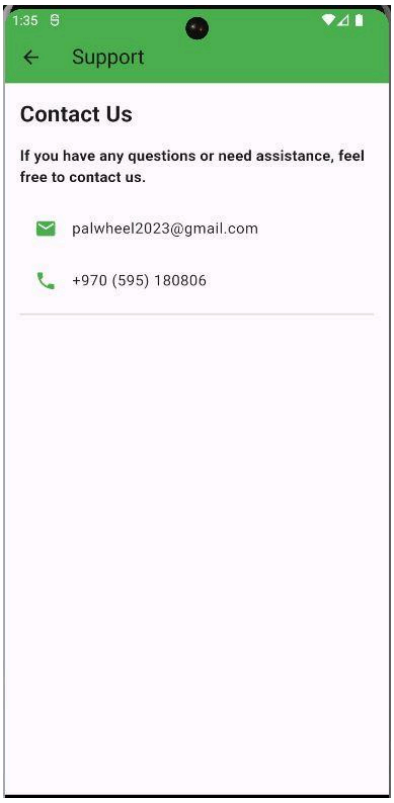


Figure 68 : Support Screen

Chapter 5: Discussion

PalWheel, a dynamic mobile app, serves as a user-friendly platform for booking rides, offering not only convenient transportation solutions but also fostering new job opportunities. By streamlining the booking process, PalWheel significantly reduces waiting times for customers, enhancing their overall experience.

Chapter 6 : Conclusions and Recommendations

Conclusions:

We have learned a new language (dart) and framework (flutter), we gained experience in building mobile apps, learned about state management, and shared preferences (caching in android), and also worked with a real-time database (Cloud firestore) in order to have real-time chatting and notification.

Future Work:

- **Custom Routing Api:**
  Considering potential road closures or constructions, future iterations of the app could involve developing a proprietary routing API. This would allow for dynamic route adjustments, providing users with alternative paths in real-time, ensuring a seamless navigation experience even in the face of unexpected obstacles.

- **Enhanced Navigation Features:**

  Integrating additional navigation features, such as estimated time of arrival (ETA) for users, will be a valuable enhancement. Providing users with real-time updates on their journey's duration enhances transparency and allows for better trip planning.

- **Advanced Driver Filtering:**

  Implementing an advanced driver filtering system could further enhance user experience. This could involve developing algorithms to filter and present the top three drivers closest to the user's location based on various factors like proximity, ratings, and availability. This ensures users have a more personalized and efficient driver selection process.

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