

IT 320 Course Project
Semester-1, 1446H



Software Product Release

Arsedha أرصدھا

Prepared by

Raghad Alzkeri, 443201025
Mashael Aljaad, 443203034
Sarah Alsaleh, 443201066
Ghada Binoun, 443200646
Batool Alkhuraim, 443200604

Supervised by
I. Ghaida AlFayez

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1 Chapter 1: Introduction

Vehicle theft is a growing problem for car owners and communities, especially in busy cities where there are more cars. Traditional methods like using newspapers to report stolen vehicles aren't working well, which makes things tough for both victims and law enforcement, who are already overwhelmed with paperwork.

Recent statistics from the Ministry of Interior in Saudi Arabia show the urgency of this issue: 38 cars are stolen daily, and less than half are recovered, making vehicle theft one of the most common crimes in the country. Our app, "Arsedha أرصدها", helps turn individual efforts into community action, creating networks and promoting cooperation through improved communication.[\[1\]](#)

To tackle the problem of vehicle theft, we created "Arsedha أرصدها", a user-friendly mobile app that simplifies reporting stolen vehicles with just a few necessary details, making it easier for communities to keep an eye out and increase the chances of recovering stolen cars. By using "Arsedha أرصدها", users can search for and identify stolen vehicles, bridging the gap between traditional police methods and modern technology. This not only facilitates the recovery of stolen cars but also strengthens community bonds by uniting people in the fight against this crime.

In this report, we introduce "Arsedha أرصدها", an app developed to address the serious issue of vehicle theft. We'll discuss the growing problem in urban areas, our app as a solution that leverages technology for community response, and our vision to enhance vehicle recovery rates and reduce theft. The proposal outlines our product roadmap, project scope, and the roles of our agile Scrum team. "Arsedha أرصدها" aims to strengthen community cooperation and significantly reduce vehicle theft.

1.1 The Problem

Vehicle theft is a notorious problem in Riyadh, disrupting daily life and impacting the economy. Imagine a scenario where a car parked overnight in a residential area is stolen, leaving the owner without transportation and facing a long and uncertain recovery process.

Our application "Arsedha أرصدها" addresses this issue by enabling community-driven action. Users can register vehicles they suspect to be stolen by entering details like the license plate number, car location, etc... This proactive approach facilitates quick reporting and efficient locating of stolen vehicles, significantly improving recovery rates in Riyadh.

1.2 The Solution

We will be creating a mobile application [\[2\]](#) that helps us solve the problem by fighting vehicle theft in Riyadh by allowing users to report and search for suspected stolen vehicles. By entering details such as license plate number, car location, etc... users can quickly share and access information, speeding up the process of finding stolen vehicles, which is faster than relying on traditional methods.

Using "Arsedha أرصدها" increases the chances of recovering stolen vehicles, which reduces financial losses for car owners and insurance companies. The app also helps prevent theft by making it risky for thieves, since cars can be quickly identified and reported. This creates a safer environment and encourages community involvement in crime prevention.

1.3 The Product Vision

1.3.1 Product Vision

For car owners Who are concerned about vehicle theft and seek a reliable way to protect their assets, The "Arsedha أرصدها" application is a community-driven mobile platform That enables any users from the community to report suspected stolen vehicles and for users with stolen vehicles to search for their own cars in real-time.

Unlike similar apps like Najm where reporting is limited to the effected parties only also traditional reporting methods that can be slow and inefficient,

Our product encourages users to work together, helping to keep an eye on the community and making it easier to recover stolen vehicles.

1.3.2 Product Roadmap

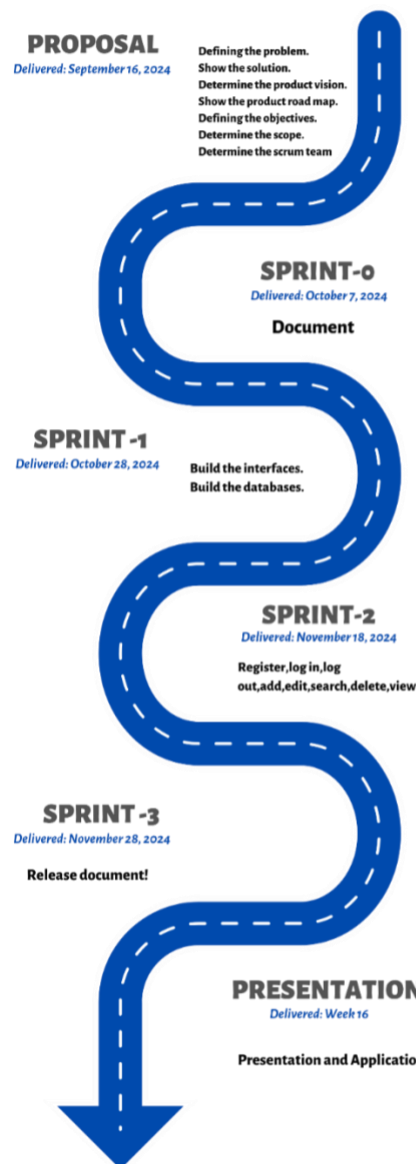


Figure 1.3.2: Product Roadmap

1.3.3 Objectives

- **Product (customer focus-value):**

1. Helps expedite and ease the process of finding stolen vehicles by offering the right method.
2. Aids owners of stolen vehicles who are seeking a reliable way to recover their cars and reclaim their property.
3. Users can Login and out of the application also register as a new user.
4. Users can view stolen vehicles details.
5. Allow users to manage stolen vehicles report (add, edit, or delete).
6. Save users time by offering an easy-to-use search system for matching reported vehicles.

- **Project (solution focus-plan):**

1. Work on Identifying user-requirements
2. Work on Developing and programing the mobile application and all the functions.
3. Design intuitive user interfaces, ensuring users can easily report and search for vehicles without technical difficulty.
4. Managing databases to securely store user and vehicle data.
5. Test the mobile application.

- **Learning (student focus):**

1. Learn to use FlutterFlow for app development
2. Use tools and IDEs like Visual Studio
3. Gain experience in designing and managing databases to store user and vehicle data.
4. Develop a project enhancing problem-solving and critical thinking skills.
5. Practice Agile development, working in a structured team environment.
6. Learn how to design a user interface that provides a seamless experience.
7. Learn to use Jira for task management and tracking project progress.

1.3.4 Scope

"أرصدھا" is designed to help manage vehicle theft effectively within Riyadh. Users can view details of stolen cars, such as license number, car type, and when and where the car was found. The app lets users create an account, log in and out, and manage stolen car reports by adding, deleting, or updating them. Users can also search for stolen cars and talk directly with the person who reported a stolen car or the owner of the stolen vehicle through a private chat. There's a 'Found' button to press when a car is located. "أرصدھا" works only on Android phones and only in English. It uses GPS to show where the car was last seen but doesn't track the car in real time. Users get instant alerts for new stolen car reports and messages in the chat.

The app won't include features that could complicate its use. It won't connect directly with Riyadh's police or offer multiple languages. There's no real-time tracking of cars, and it doesn't use extra security steps like multi-factor authentication to keep things simple. However, we will consider adding these features in the future as we evaluate user feedback and technological advancements.

1.4 Scrum Team

Scrum Team	
Product Owner:	Sarah Alsaleh
Developers:	Sarah Alsaleh Raghad Alzkeri Ghada Binoun Batool Alkhuraim Mashael Aljaad
Scrum Master (SM):	I. Ghaida Alfayez
Stakeholders:	I. Ghaida Alfayez

1.4.1: Scrum Team

2 Chapter 2: Domain Analysis

In this section, we will introduce the domain in which our customers are expected to use the software. We will conduct domain analysis to better understand our software and its requirements. Our domain is vehicle theft prevention, which focuses on providing tools and systems to help users report and recover stolen vehicles efficiently. This domain is essential for car owners, law enforcement, and communities, especially in large cities where vehicle theft is a common issue.

The vehicle theft prevention domain involves various activities such as reporting stolen vehicles, sharing information with the public and authorities, and using technology like GPS to view the last location of the vehicle. Our motivation is to develop a more effective, community-driven solution.

In our application, "Arsedha", أرسدها we specifically focus on vehicle theft within Riyadh. This app is designed to enable community participation in reporting stolen vehicles and to streamline the process of sharing important details, such as license plate numbers and vehicle descriptions. By using the app, users can interact with each other and increase the chances of vehicle recovery.

In our software engineering process, we gathered information from multiple sources, including government reports on vehicle theft statistics, existing apps like "Absher", "Najm," and "Haraj". This research helped us design a system that not only improves the reporting process but also enhances the user experience by making it more accessible and community-driven.

2.1 Terminology

In this section we will introduce some terminology that we will be using in our application or in the documentation process that may be unclear or not part of our everyday language.

Vehicle: A thing used for transportation in our app specifically a car. [3]

Search: Allows users to look up reported stolen vehicles based on specific criteria (e.g., license plate number, vehicle make/model).

Stolen Vehicle Report: A Report submitted by users to inform other users about suspected stolen vehicles, including relevant information (e.g., license plate number, vehicle make/model).

Reported date: The date when the vehicle was first reported.

Vehicle Location: Using GPS to show where vehicles were last seen.

Vehicle make: The vehicle manufacturer (e.g., Toyota, Ford).

Vehicle model: The specific name given to a vehicle by its manufacturer (e.g., Camry, Mustang).

License plate number: A metal plate on a vehicle that shows a series of numbers and letters used to identify the vehicle.[4]

Vehicle Color: The exterior paint color of the vehicle.

Description: Any other relevant details that could help in locating the vehicle (e.g., stickers, dents, or special characteristics)

Found Status: An update users can indicate when a stolen vehicle has been successfully found/dealt with.

Vehicle Database: A collection of information on reported stolen vehicles.

Backlog: A prioritized list of tasks or features that must be completed in future sprints.

User Story: an informal, general explanation of a software feature written from the end user's perspective. Its purpose is to articulate how a software feature will provide value to the customer.[5]

Acceptance Criteria: Conditions must be met for a user story to be considered complete.

Features: Specific functionalities available in the app.

Use case diagram: illustrates a set of use cases for a system.[6]

2.2 General Domain Knowledge

In this section, we'll go over the key facts and guidelines in our field that experts typically follow and understand.

Reporting Processes: The knowledge of how to report a stolen vehicle, including gathering key details like the license plate number and the last known location.

Community Involvement: The knowledge of how community support can enhance recovery efforts by sharing information quickly and efficiently.

User Experience (UX) Design: The knowledge of designing a user-friendly app that simplifies the reporting process and makes it easy for users to navigate.

Alerts and Notifications: The knowledge of implementing real-time notifications to keep users updated on sightings or changes related to their stolen vehicles.

Incident Tracking: The knowledge of maintaining accurate records of stolen vehicles and their recovery updates, to ensure transparency and accountability.

2.3 Customers and Users

In this section, we will describe the main domain of **Arsedha**, which revolves around vehicle theft reporting and recovery. The **Arsedha** app targets individuals in the community who come across suspicious vehicles and suspect they may be stolen. These users can report such vehicles through the app, providing a quick and effective way to assist car owners and relevant authorities in locating stolen vehicles.

Anyone in the community who encounters a suspicious vehicle can use the platform to report it, helping to increase the chances of recovering the vehicle to its owner. Insurance companies looking to reduce fraud and improve vehicle recovery rates can also integrate the app to streamline recovery

processes and ensure accurate claim assessments. Additionally, law enforcement agencies can leverage community reports to support their ongoing efforts in combating vehicle theft.

Our platform is also valuable to automotive companies and community organizations aiming to enhance security and reduce the risk of vehicle theft.

2.4 The Environment

In this section, we will outline the development of **Arsedha** as a mobile application using the Flutter Flow environment. It will be available exclusively for Android platforms, and users will be able to download it from the Google Play Store. The application is specifically designed for individuals who wish to report suspicious vehicles, offering a user-friendly interface to submit and manage reports of potentially stolen vehicles.

2.5 Tasks and Procedures

In this section, we will explain what people currently do with the existing methods of reporting car theft and their methods of working through this process.

Users may follow various routes to report and recover stolen vehicles. Below, we outline the processes for reporting through traditional methods, such as contacting the police, and through platforms like Haraj.

Traditional Police Reporting:

People visit the nearest police station to file a report about their stolen vehicle. They are required to provide detailed information, including the license plate number, vehicle description, and the location of the theft.

Or, Haraj Platform:

People open the **Haraj** app or website, which is commonly used for buying and selling vehicles, and post about their stolen vehicle in hopes that someone might see or come across it. Users include pictures, license plate numbers, and any identifying features of the vehicle.

View Reports and Alerts:

After filing a police report, people may check for updates on the status of the investigation.

Or, On Haraj, users hope someone will spot their vehicle listed for sale or identify it through a search.

Coordinate with the Community:

In traditional methods, people may contact the police periodically for updates on their stolen vehicle case. **Or, On Haraj**, users can communicate with potential helpers via private messages, comments, or through buyer-seller chats, which might provide leads but lacks a structured recovery process.

Confirm or Finalize Reports:

Once the vehicle is found, people may need to visit the police station again to close the case and retrieve their vehicle, which adds more time to the process.

Or, On Haraj, users can mark their vehicle as found or delete their post.

As shown, the process can be long, tedious, and inefficient, especially when relying on traditional reporting methods or platforms like **Haraj**. Thus, we aim to streamline this experience through the development and deployment of the **Arsedha** app, allowing for faster and more community-driven vehicle recovery.

2.6 Competing Software

The table below presents a **competitive product analysis** comparing four systems: **Absher**, **Haraj**, **Najm**, and **Arsedha**. This comparison highlights the key features that distinguish "Arsedha" from its competitors in the market. By evaluating the functionalities offered by each system, we can identify the strengths and weaknesses of "Arsedha" and ensure it addresses unmet user needs effectively. The features analyzed include community-driven reporting, private chat, GPS with last location display, and language support.

	Absher	Haraj	Najm	Arsedha
Community-Driven Reporting	×	✓	×	✓
Private Chat	×	✓	×	✓
GPS with Last Location Display	×	×	×	✓
Support Arabic language	✓	✓	✓	×

2.6.1: Competing Software

2.7 Similarities Across Domains and Organizations

In this section, we will look at what makes the vehicle theft prevention field different from other areas and also what it has in common with similar fields.

The vehicle theft prevention field is unique because it focuses on helping people protect their cars and recover them if they are stolen. This makes it different from broader areas like general crime reporting, which cover many types of crimes. Vehicle theft, in particular, is a serious problem because it causes both emotional and financial stress, so the solutions need to be fast, efficient, and specifically designed for finding stolen vehicles.

In this domain, the app "Arsedha أرصدها" stands out even more. The app is specifically made to help tackle vehicle theft in Riyadh. It lets users report stolen cars, share important details like license plate numbers, and communicate with others in the community. By focusing on car theft, "Arsedha أرصدها" provides a targeted solution that helps users work together and improve the chances of recovering their stolen vehicles.

Although this field is quite unique, it also has some things in common with other areas. For example, "Haraj" uses real-time alerts and sharing information, some important fields like general crime prevention or emergency response as an example apps like "Absher" and "Najm" also allow users to

report incidents and use location services, but they deal with a variety of issues, not just vehicle theft. On the other hand, "Arsedha أرصدها" focuses only on vehicle theft, which makes it more specialized.

In conclusion, the vehicle theft prevention field is different because it focuses on a specific problem—recovering stolen cars—and helps people take action together. "Arsedha " أرصدها fits well into this field, providing a tool that helps people in Riyadh protect their cars. At the same time, the app shares some features, like real-time alerts and reporting, with other similar fields, making it adaptable for future use.

3 Chapter 3: Requirements Engineering

In this section, we'll explore the key phases of the requirements engineering process. We began by gathering and documenting requirements through user interviews and questionnaires. We also took a closer look at the characteristics of our users and created a Use Case Diagram to illustrate the app's functionality. Additionally, our report features a Product Backlog filled with essential items, and we used User Stories to clearly express the desired features and functionalities.

As part of our requirements engineering process for the *Arsedha* app, we started by gathering essential requirements. To fully understand user needs, we explored various methods such as observations, workshops, focus groups, use cases, and prototypes. Ultimately, we decided on two main approaches: user interviews and questionnaires, which aligned well with our objectives and helped avoid conflicting requirements. In our user interviews (**See Appendix A: Interview**), we spoke with two stakeholders and asked five targeted questions regarding the effectiveness, obstacles, community support, management features, and user motivation. This allowed us to collect valuable insights, which we documented in detailed interview transcriptions that included names, locations, time, date, objectives, agenda, and notes on topics not covered. This comprehensive data collection helps us shape the app effectively. Additionally, we distributed questionnaires (**See Appendix B: Questionnaires**) featuring nine carefully designed questions to a wider audience, resulting in a total of 23 responses. The questionnaire looked at several important aspects, like how easily users can access information, their preferred ways to report a stolen vehicle, and what features they think *Arsedha* should have. By analyzing the responses and showing the data in pie charts, we gained a clearer picture of what users really need and the challenges they face. This insight helps us tailor the development of the app to better meet their expectations and make it more effective.

The interviews and questionnaires conducted provided valuable insights into the preferences and challenges people face when it comes to reporting stolen vehicles and recovering them through community efforts.

From the first interview, it became clear that the fastest and most effective way to report a stolen vehicle is through a mobile app that allows users to quickly input key details like the license plate number and the last known location. The interviewee emphasized that simplicity and speed are essential for reducing the time spent on the reporting process. However, the interviewee also expressed frustration with the lack of timely updates from authorities, feeling that their report wasn't prioritized. Community involvement was seen as crucial, as quick information sharing and collective efforts were thought to significantly increase the chances of recovering stolen vehicles. Additionally, the interviewee suggested that the app should provide user-friendly management tools, such as the ability to update or delete reports and communicate with others. Incentives for reporting sightings, such as rewards, were also highlighted as a way to boost community participation.

The second interview echoed many of these points, with the interviewee stressing the power of community connections in recovering stolen vehicles. They suggested that contacting community groups or forums directly could help spread the word quickly, making it easier for authorities to act. However, the interviewee also pointed out that confusion around the reporting process is a significant issue, as many individuals don't know where to start or what information to provide. Like the first interviewee, they emphasized the need for an easy-to-use app that allows users to manage their reports efficiently and communicate with others. Rewards for reporting stolen vehicles were again mentioned as a way to encourage more people to use the app.

As for the questionnaire, the findings reflected similar concerns. A large portion of respondents (43.5%) indicated that accessing information about stolen vehicles is difficult, with 26.1% finding it very difficult (as shown in

Figure 5). A majority of respondents (60.9%) preferred using a mobile app for reporting stolen vehicles, emphasizing the importance of a centralized platform where users can view detailed reports (as shown in

Figure 6, 7). In fact, 78.3% of respondents said it was extremely important to have such a platform, with 69.6% valuing features like the ability to view vehicle details, and 65.2% highlighting the need for instant alerts (as shown in

Figure 8).

When it came to challenges, 34.8% of respondents pointed to the lack of timely updates as the biggest issue, while 30.4% found it difficult to identify the correct reporting channels. Limited community support was also noted by 26.1% of respondents (as shown in

Figure 9). In terms of likelihood to use an app like *Arsedha*, 69.6% said they were very likely to use it (as shown in

Figure 10), with 56.5% saying community involvement and support would motivate them the most.

A user-friendly design was also important to 26.1% of respondents, while 13% cited trust in the app's effectiveness as a key factor. (As shown in

Figure 11).

Regarding notifications, 56.5% of respondents preferred receiving push notifications through the app, while 39.1% favored SMS notifications (as shown in

Figure 13). Overall, the results indicate that ease of use, real-time updates, and community involvement are crucial to the success of a stolen vehicle reporting app like *Arsedha*.

In summary, during the requirements engineering process, we initially focused on gathering and documenting requirements by using methods like interviews and questionnaires to collect specific app needs. Additionally, the **System's Users** section outlined our users' main characteristics, such as their education, experience, and technical skills, which helped us customize the app to suit their needs. We also created a **Use Case Diagram** to visually show the app's functionality from the user's point of view. This diagram highlighted the different interactions and use cases the app supports. Furthermore, we developed a **Product Backlog** that included backlog items (PBIs) representing features and functionalities designed to deliver real value to users. Lastly, we crafted **user stories** to clearly describe the functionalities we aimed to include in the app.

3.1 System Users

- **Language Requirement:** The Arsedha app is available only in English. Therefore, users must have a basic understanding of English for navigating the app and submitting reports.
- **Educational Background:** While users come from various educational backgrounds, the platform does not impose any specific educational qualifications. What matters is their responsibility and ability to contribute to vehicle theft prevention.
- **Demographics:** The app is intended for adults aged 18 years and above who want to actively participate in addressing local issues related to car theft. It accommodates users of both genders.
- **Technical expertise:** Users should have a foundational familiarity with mobile devices, as the app relies on simple navigation and reporting mechanisms. Prior experience with similar community or reporting apps is beneficial but not required.
- **Experience:** They believe in the power of community efforts to reduce crime and rely on Arsedha to keep them informed and engaged.

3.2 Use Case Diagram

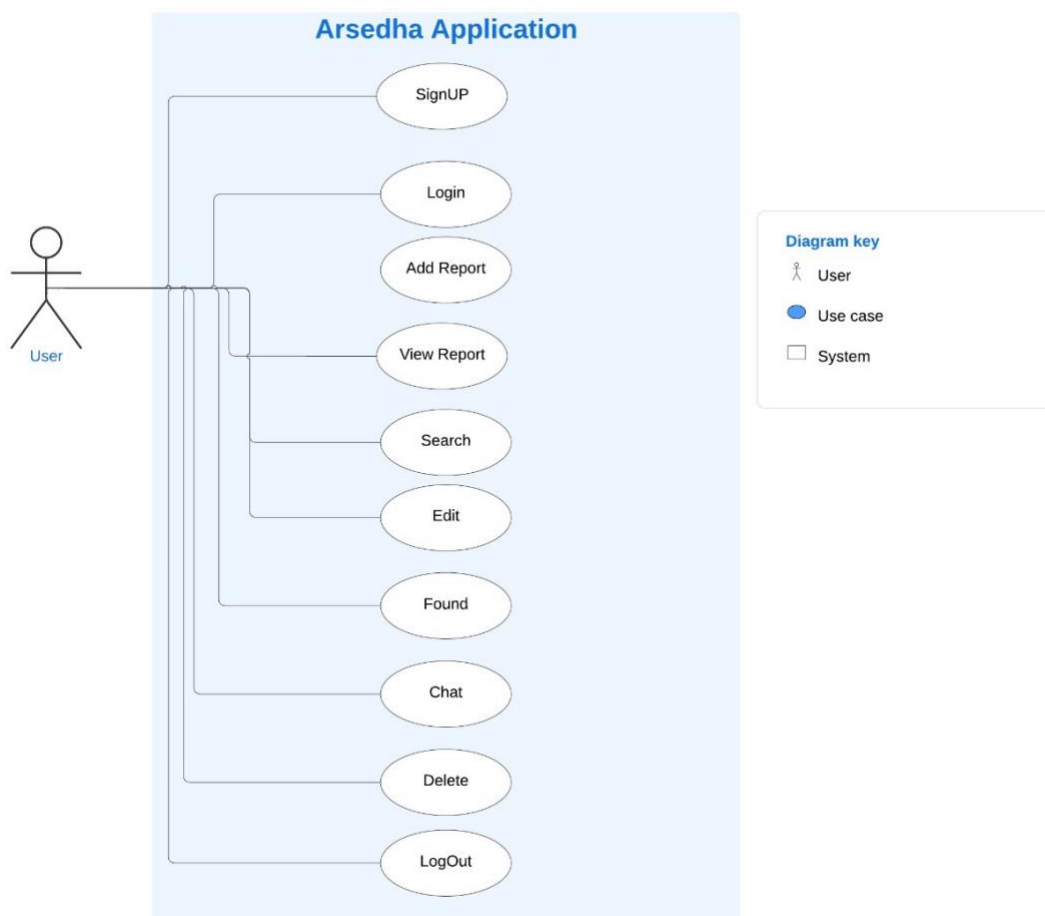


Figure 3.2.1: Use Case Diagram

3.3 Product Backlog

In this section, we will present the product backlog. The product backlog consists of Product Backlog Items (PBIs), typically organized in a table with four columns: PBI, size, type, and acceptance criteria. The PBIs are arranged by priority, starting from the highest down to the lowest. The foundation of the product backlog is user stories, the product backlog is made up of PBIs, which are features or functionalities that provide measurable value to the user or customer. This product backlog will also be documented in Jira for tracking and management.

3.4 Definition of Done

Example Definition of Ready	
√	Business value is clearly articulated
√	Details are sufficiently understood
√	Dependencies are identified; no blocking dependencies exist
√	Team is appropriately staffed relative to the PBI
√	Estimated and small enough to be completed during sprint
√	Acceptance criteria are clear and testable
√	Performance criteria, if any, are defined and testable
√	Team understands how to demo the completed PBI

3.4.1: Definition of Done

3.4.2: User Stories

PBI (user story)	Size (Story points)	Type (Feature, defect, technical work, knowledge acquisition)	Acceptance Criteria The conditions of satisfaction that must be met for that item to be accepted.
As a user, I want to sign up and create an account so that I can access the app and take advantage of its features.	3	Feature	<ul style="list-style-type: none"> When I go to the sign-up page and enter my details—like my name, age, email, password (at least 8 characters long), and phone number—and click "Sign Up," the system should check if I'm already registered. If I'm a new user, I should see a confirmation message and be taken to the login page so I can start using the app. If I've already signed up, the system should show a message asking me to log in instead. if I forget to fill in any required fields, the system should let me know what's missing and prompt me to complete the form before proceeding.
As a user, I want to log in using my username and password so that the system can verify my identity, allowing me to access my account and personal information.	2	Feature	<ul style="list-style-type: none"> If I navigate to the login page and input my username and password correctly, then after clicking the "Log in" button, I should be directed to the home page and view my data. If I enter an incorrect username or password and click "Log in," the system should display an error message indicating that the credentials are incorrect. If I correctly enter my username and password and press "Log in," the system should load my account and personal data within five seconds.

As a user, I want to be able to log out of my account so that I can protect my personal information and ensure my account's security	2	Feature	<ul style="list-style-type: none"> As a logged-in user, when I click the "Logout" button in the app, I should be successfully signed out of my account. After logging out, if I attempt to access any restricted pages or features, I should be redirected to the login page, showing that I no longer have access until I sign in again.
As a registered user, I want to add a report for a stolen vehicle so that I can aid in recovering stolen vehicles	3	Feature	<ul style="list-style-type: none"> The user can access the "Add Report" feature from the main menu. The user must log in to their account to access the reporting feature. The report form includes fields for: <ul style="list-style-type: none"> Vehicle make Vehicle Model Year of manufacture Color License plate number Date and time of the incident Location where the vehicle was stolen Additional details or description (optional) The user can submit the report after filling in the required fields. Upon submission, the user receives a confirmation message indicating the report has been successfully submitted. The report is stored in the user's account and can be accessed later. The report is visible to the community, allowing other users to see and potentially assist in the recovery of the stolen vehicle.
As a registered user, I want to view stolen vehicle reports so that I can identify details of stolen vehicles and privately chat with the user who added the report.	2	Feature	<ul style="list-style-type: none"> The user can access the "View Reports" feature from the home page All registered users can see a list of all reports submitted by others, displaying basic information such as: <ul style="list-style-type: none"> Vehicle make Vehicle Model Year of manufacture Color License plate number Date and time of the incident Location where the vehicle was stolen

			<ul style="list-style-type: none"> ○ Additional details or description provided by the reporting user. • When a user taps on a report, they can view detailed information • Users have the option to initiate a private chat with the user who submitted the report. • Users can filter or search reports based on criteria such as date, vehicle make, or location. • Reports are updated in real-time as new reports are added or existing reports are resolved.
As a registered user, I want to search for specific vehicles by their license plate number, so that I can quickly find and track reports on stolen vehicles.	2	Feature	<ul style="list-style-type: none"> • When a user accesses the vehicle search section, a search field should be displayed, allowing the input of a vehicle's license plate number. • Upon submitting a search query, the system should process the request and display a list of vehicles that match or are closely related to the entered license plate number. • The search results should prioritize exact matches or similar license numbers, ensuring that the relevant vehicle information is prominently displayed. • If no vehicles match the search criteria, the system should notify the user that no results were found.

<p>As a registered user, I want to edit my existing suspicious vehicle report if I realize the information (e.g., location, description, or license plate) is incorrect, so that I can provide accurate and updated details for the community.</p>	<p>2</p>	<p>Feature</p>	<ul style="list-style-type: none"> • When a user accesses the "My Reports" section, the system should display a list of their submitted reports, with an option to edit each report. • Upon selecting the edit option for a specific report, the system should display the current details of the report, including fields for the license plate number, vehicle description, location, and other. • The system should allow the user to modify any of the displayed fields (e.g., updating the location or correcting the license plate number). • After submitting the changes, the system should validate the input and update the report details if the modified information is valid. • If the report is successfully updated, the system should display a confirmation message indicating that the changes have been saved.
---	----------	----------------	--

As a registered user, I want to delete my submitted report if I realize there is incorrect information about the vehicle or if the vehicle is not actually stolen, so that the system only contains accurate and relevant reports.	2	Feature	<ul style="list-style-type: none"> When a user accesses the "My Reports" page, the system should display a list of their submitted reports with an option to delete each report. If the user realizes that the information in a report is incorrect or that the vehicle is not stolen, they should be able to select the delete option for that report. Upon selecting the delete option, the system should prompt the user to confirm the deletion. If the user confirms the deletion, the system should remove the report from the system and display a confirmation message indicating that the report has been successfully deleted. If the user cancels the deletion, the system should retain the report without any changes.
As a registered user, who issued the report I should be able to change the stolen vehicle status to found after conforming that it was recovered, so the system updates the status and removes it from the list of active stolen vehicles.	2	Feature	<ul style="list-style-type: none"> When the original user who reported the stolen vehicle views their report, they should see a "Found" button on the report page. Clicking the "Found" button should update the vehicle's status to "Found" in the system. The system should notify all relevant users (including the original reporter) that the vehicle has been marked as "Found." After the vehicle is marked as "Found," it should be automatically removed from the list of active stolen vehicles. If the user is not logged in, the system should prompt them to log in before allowing them to mark the vehicle as "Found."

As a registered user, I want to engage in a private chat with others who have reported or found a stolen vehicle, so I can directly communicate and exchange information about the case.	3	Feature	<ul style="list-style-type: none"> When users click on a reported vehicle, they should have the option to initiate a private chat with the person who reported or found the car. The chat interface should be simple, displaying the conversation history, with a text input field for sending messages. Users should be able to send and receive messages in real time. If a user receives a new message while the app is closed, they should be notified via a notification. If no chat history exists, the system should allow starting a new conversation without displaying previous messages.
As a user, I want the app to load stolen vehicle reports quickly so that I don't have to wait for the details to show up.	3	Feature	When I view a stolen vehicle report, the details should load in less than 40 seconds.
As a user, I want the app to be available almost all the time so that I can report or search for stolen vehicles whenever I need to.	2	Feature	The app should be accessible 99% of the time over a 24-hour period to ensure its reliable and always ready when needed.

4 Chapter 4: System Design

4.1 System Architecture

A suitable architecture for the **Arsedha** app is the client-server architecture. This design divides the system into two main components: the client, which represents the user interface on mobile devices, and the server, which handles data processing and business logic. The client interacts with the server to perform various operations such as registering, logging in, adding, deleting, and editing vehicle reports, as well as viewing submitted reports.

The client-side focuses on user-facing functionalities, providing an intuitive interface for seamless interaction. It allows users to navigate through the app, manage reports, and perform their tasks efficiently. On the server side, a centralized database securely stores user data and vehicle reports. The server is responsible for processing client requests, retrieving and updating data, and ensuring consistent functionality across the system. The business logic is implemented using modern frameworks to optimize performance and reliability.

This architecture is ideal for **Arsedha** due to its scalability and separation of concerns between the client and server components. This separation allows the app to be easily updated and maintained without affecting the overall system. In contrast, a Peer-to-Peer architecture would complicate data management and consistency, while monolithic designs lack flexibility for future growth. The centralized client-server approach ensures efficient data handling and provides a reliable foundation for the app's functionalities.

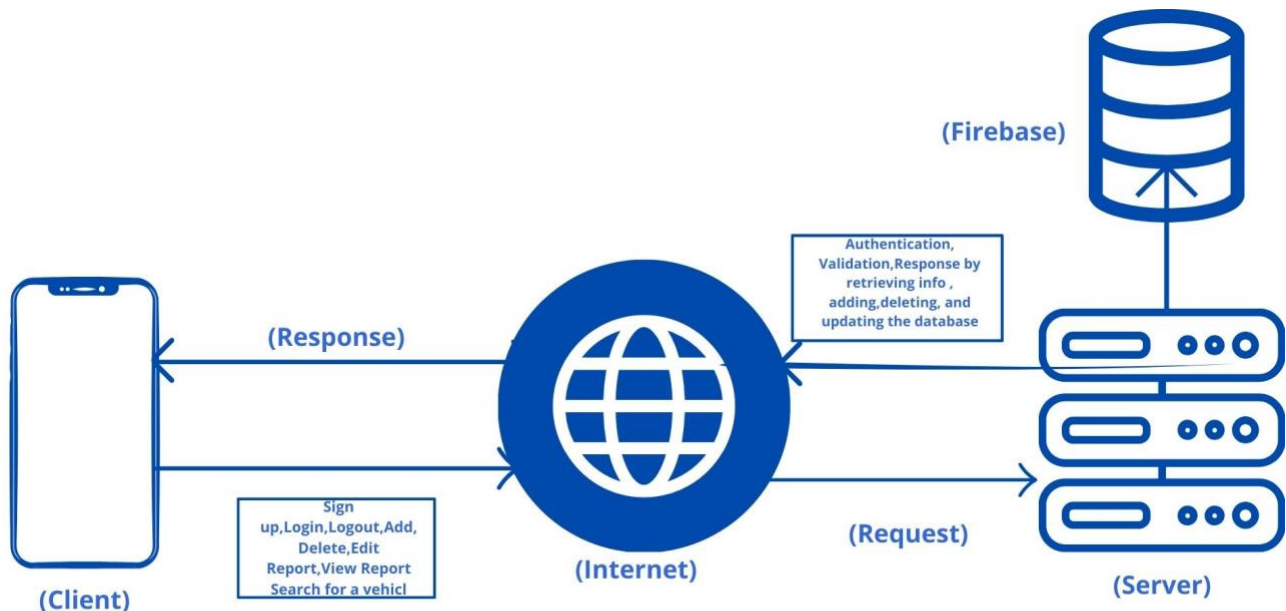


Figure 4.1.1: System Architecture.

4.2 Class Diagram

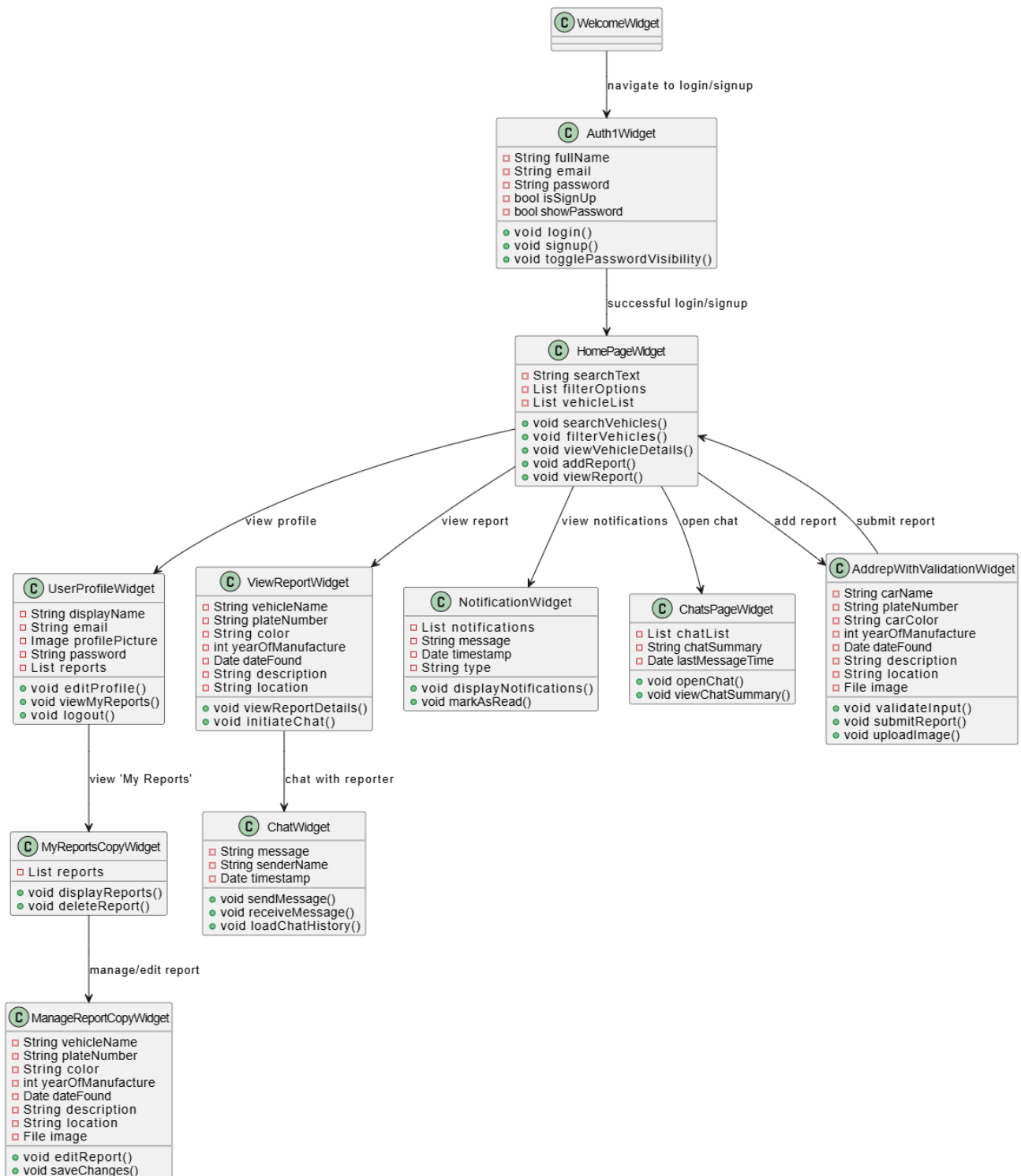


Figure 4.2.1: Class Diagram

Link of the class diagram: <https://drive.google.com/file/d/1Kml7HglsI--ifCutqg5BPorA7PoOEXj6/view?usp=sharing>

4.3 Data Design

This section outlines the database design, including the ER diagram for visualizing entities and relationships, the relational schema detailing tables and attributes, and the data dictionary describing entities, attributes, and relationships. These components ensure a clear and organized structure supporting the application's functionality.

- **ERD**

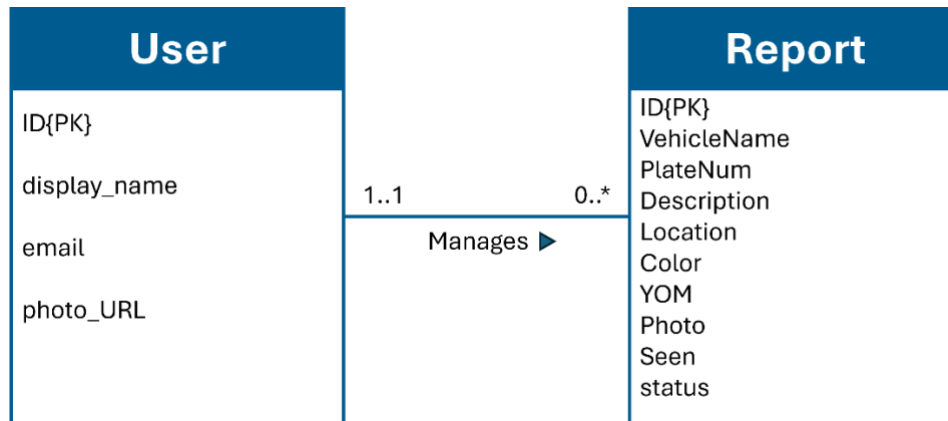


Figure 4.3.1: ERD

- **Schema:**

User (ID, display_name, email, photo_URL)

Primary Key: ID

Report (ID, VehicleName, PlateNum, Description, Location, Color, YOM, Photo, Seen, status, UserID)

Primary Key: ID

Foreign Key: UserID References User(ID)

- **Data Dictionary:**

1. Data Dictionary of all entities.

Entity Name	Description	Aliases	Occurrence
User	A user represents anyone using the app, whether they are searching for their stolen vehicle or submitting a report for a stolen vehicle.	---	One record per user.
Report	Refers to a detailed report about stolen vehicles, submitted by users, including vehicle details, location, and current status.	Vehicle Report	Multiple reports per user.

4.3.1: Data Dictionary of all entities

2. Data Dictionary of all attributes

Entity Name	Attribute	Description	Data type	Length	Nulls	Multi-valued	Default-value	Range	PK
User	ID	User's ID	String	36	No	No	Auto-generated	N/A	Yes
	display_name	User's Full Name	String	255	No	No	N/A	N/A	No
	email	User's Email	String	320	No	No	N/A	N/A	No
	password	User's Password	String	100	No	No	N/A	N/A	No
	photo_URL	User's Profile Picture	Image path	500	Yes	No	Default Profile Picture	N/A	No
Report	ID	Report's ID	String	36	No	No	Auto-generated	N/A	Yes
	VehicleName	Vehicle's Make and Model	String	255	No	No	N/A	N/A	No
	PlateNum	License plate number of the vehicle	String	8	No	No	N/A	N/A	No
	Description	Additional details or comments about the report	String	500	Yes	No	N/A	N/A	No
	Location	Geographic location of the vehicle (latitude and longitude)	Lat Lng	N/A	Yes	No	N/A	N/A	No

	Color	Color of the reported vehicle	String	50	No	No	N/A	N/A	No
	YOM	Year of manufacture of the vehicle	Integer	4	No	No	N/A	N/A	No
	Photo	URL/path to an image of the reported vehicle	Image path	500	Yes	No	N/A	N/A	No
	Seen	Date and time when the vehicle was last seen	Date/Time	N/A	Yes	No	NULL	N/A	No
	status	Status of the report (Found or Not).	Boolean	N/A	No	No	False	True/False	No

4.3.2: Data Dictionary Of all attributes

3. Data Dictionary of all relationships

Entity Name	Multiplicity	Relationship	Entity Name	Multiplicity
User	1	Manages	Report	0..*

4.3.3: Data Dictionary Of all relationships

4.4 Component Design

This section focuses on the design of our system's key components, specifically how users can add, edit, and delete reports. We'll provide clear design details and step-by-step pseudocode for each user story to explain how these features will work. Additionally, we'll include time and effort estimates for implementing them. The goal is to give a simple yet complete understanding of how these features will be developed, supported by detailed workflows and logic.

Table 4.4.1 :Component Design.

Sprint number	PBI (user story)	User story tasks with effort estimates in hours				Sum of effort
2	As a registered user, I want to add a report for a stolen vehicle so that I can aid in recovering stolen vehicles	Create a Firestore collection to store report information and create fields to store the report details (such as VehicleName, PlateNum, color, Location, etc.).	Design the "Add Report" interface, including a form for report details and a button to submit the form.	Create a form in the "Add Report" page to input details required for adding a report.	Handle and validate the inputs, and if successful, save the data to the Tasks table. Show a confirmation message and display the report details on the "My Reports" page and the Home page.	11
		Hours: 2	Hours: 3	Hours: 2	Hours: 4	
2	As a registered user, I want to edit my existing suspicious vehicle report if I realize the information (e.g., location, description, or license plate) is incorrect, so that I can provide accurate and updated details for the community.	Create a form to view and modify existing reports, and add an "Edit" button on the "My Reports" page next to each report.	Fetch and display the current report details in the form for editing.	Update report details in the database upon submission.	Generate a confirmation message upon success, edit the location, description, and license plate in the report, and reflect the changes in both the "My Reports" and "Home Page" interfaces.	11
		Hours: 4	Hours: 2	Hours: 3	Hours: 2	
2	As a registered user, I want to delete my submitted report if I realize there is incorrect information about the vehicle or if the vehicle is not actually stolen, so that the system only contains accurate and relevant reports.	Add "Delete" button in "My Report" page next to each report, displaying a confirmation message when its clicked.	Checking deletion of the report from the database			3
		Hours: 2	Hours: 1			

- **Add Report:**

Classification: Function

Definition:

The user should be able to add a new report by providing all necessary information.

Construction:

Inputs: vehicle Name, Plate Number, Vehicle Color, Year, Date, Description, Location, Image.

Precondition: User must be signed in.

Postcondition: The Report is added to the database and displayed in "My Reports" & "Home Page".

Pseudocode:

BEGIN

IF user clicks the "Add" button in the navigation bar:

DISPLAY "Add Report" page

DISPLAY fields for Vehicle Name, Plate Number, Vehicle Color, Year, Date, Description, Location, Image

WHILE any field is empty:

DISPLAY message: "Please fill all required fields."

IF all fields are filled:

ADD report information (Vehicle Name, Plate Number, Vehicle Color, Year, Date, Description, Location, Image) to the database

DISPLAY message: "Report added successfully."

DISPLAY the new report in "My Reports" page

DISPLAY the new report in "Home Page"

ENDIF

ENDIF

END

- **Edit Report:**

Classification: Function

Definition: The user should be able to modify existing reports.

Construction:

Inputs: Vehicle Name, Plate Number, Vehicle Color, Year, Date, Description, Location, Image.

Precondition: User must be signed in, and the report must already exist.

Postcondition: The report is updated in the database, and the changes are shown on the "My Reports" and home pages.

Pseudocode:

BEGIN

IF user clicks on the "Edit" button in the "My Reports" page:

DISPLAY the "Edit Report" page with existing report details pre-filled

DISPLAY "Done" button

```

IF user clicks on "Done" button:
    UPDATE report information (Vehicle Name, Plate Number, Vehicle Color, Year, Date,
Description, Location, Image) in the database
    DISPLAY message: "The report has been successfully updated."
    DISPLAY the updated report in "My Reports" page
    DISPLAY the updated report in "Home Page"
ENDIF
ENDIF
END

```

- Delete Report:

Classification: Function

Definition: The user should be able to delete their report.

Construction:

Precondition: The user must be signed in and the report must already be added.

Postcondition: The report is deleted from the database and removed from "My Reports".

Pseudocode:

```

BEGIN
IF the user clicks the "Delete" button:
    DISPLAY a message to the user asking to confirm the deletion
    IF the user confirms the deletion:
        DELETE the report from the database
        DELETE the report from the "My Reports" page and home pages
    ELSE
        Do nothing
    END IF
END IF
END

```

4.5 Interface Design

- User Navigation Hierarchy

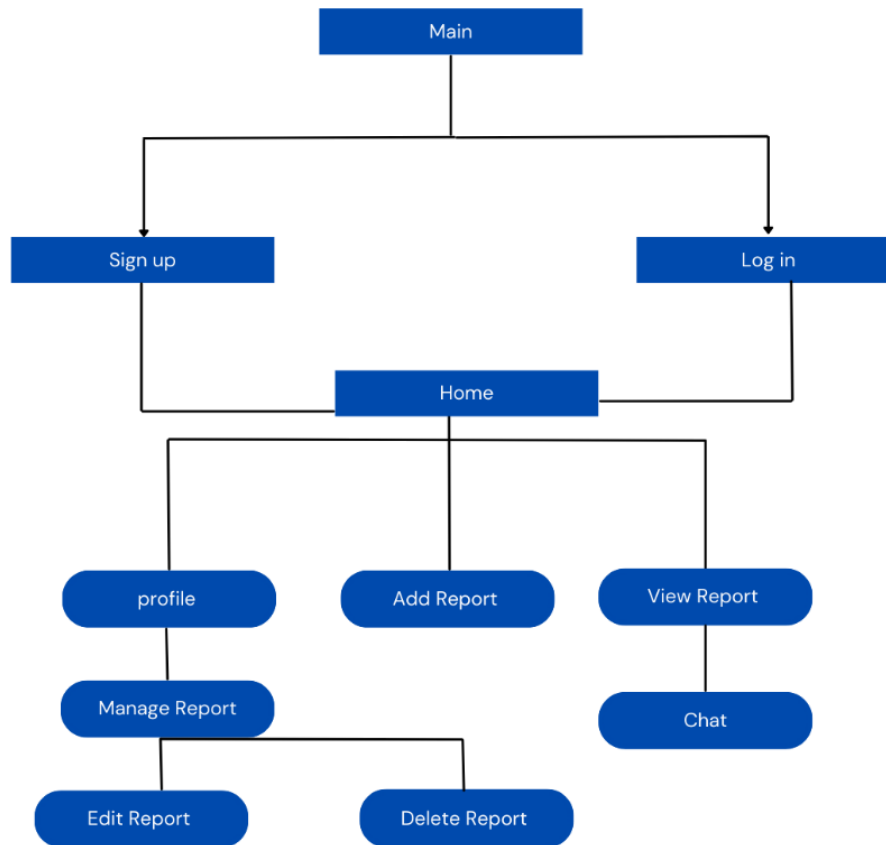


Figure 4.5.1: Navigation Hierarchy.

- **UX Guidelines implemented for each interface:**

Feedback:

- Users receive confirmation messages after critical actions, such as successfully editing or deleting a report, ensuring they are informed about the results of their actions.
- Error messages are displayed clearly if a user inputs invalid data.

Error Prevention:

- Confirmation prompts are implemented before deleting reports to prevent accidental data loss.
- Validation rules ensure that data entered by users (e.g., license plate format) meets required standards.

Mobile-Friendly Design:

- The interface is designed specifically for mobile devices, ensuring all elements are optimized for touch interaction and small screens.

Flexibility and Efficiency of Use:

- Features like "Edit" and "Delete" are accessible directly on the report card, reducing the number of clicks required to perform tasks.

Contextual Navigation:

- The back arrow in the header allows users to exit the page seamlessly without confusion.
- Clear labels and logical placement of buttons (e.g., "Edit" and "Delete" below the description) enhance usability.

Task Efficiency:

- Common tasks, such as viewing, editing, and deleting reports, are streamlined and can be completed with minimal steps.
- The app's simplicity reduces cognitive load, allowing users to focus on their primary actions.

• User interfaces:

1. Main page:



Figure 4.5.2

#	Description
1	start button that direct the user to log in page.

Table 4.5.1

2. Log in page (if user click on #1):

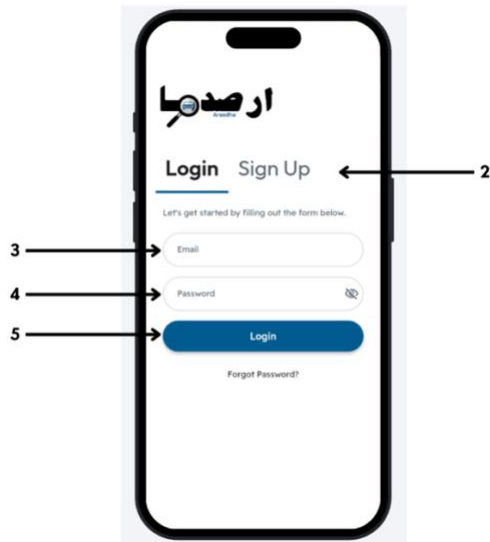


Figure 4.5.3

#	Description
2	Signup button that transfers the new user to sign up page.
3	User's email input field that is mandatory to access user's page.
4	User's password input field that is mandatory to access user's page.
5	Log in button that transfer the user to the home page when all information entered.

Table 4.5.2

3. Sign up page (if user click on #2):

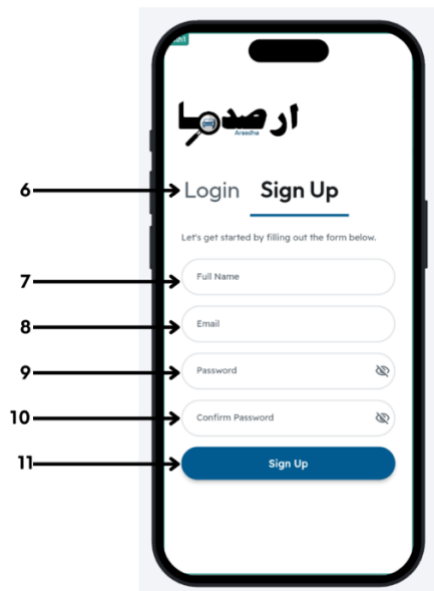


Figure 4.5.4

#	Description
6	Log in button that transfer user to log in page if already have an account.
7	User's name input field that is mandatory to register as new user and access user's page.
8	User's email input field that is mandatory to register as new user and access user's page.
9	User's password input field that is mandatory to register as new user and access user's page,
10	User's confirmation password input field that is mandatory to register as new user and access user's page, and it must be like the password on the past field.
11	Sign up button that transfer the new user to home page when all information entered.

Table 4.5.3

4. Home page (if user signup/login successfully):

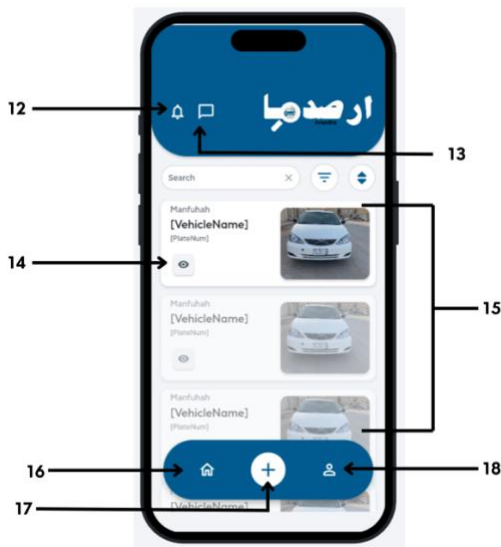


Figure 4.5.5

#	Description
12	notification button to direct the user to the notification page
13	chat button directs the user to the chats page
14	view button directs the user to the view page
15	Displayed all the vehicles with its name, Color, location and a picture of the car
16	Home button to direct the user to the home page.
17	Add button to direct the user to the add report page.
18	User profile button to direct the user to their profile

Table 4.5.4

5. Add report page (if the user clicks on #17)



Figure 4.5.6

#	Description
19	The vehicle plate number and car name input field is mandatory when adding a new vehicle
20	The vehicle car color input field is mandatory when adding a new vehicle
21	The vehicle year input field is mandatory when adding a new vehicle
22	The date found button allows the user to add the date and time where vehicle was first seen
23	A description input field for adding extra information
24	Selecting an image of the vehicle the user wants to upload
25	After filling all the information, the user can use the button to add the report. A pop-up window will appear to inform the user that the report was added
26	The user has the ability to view and select date of when the car was first seen
27	Clicking on Ok will drive the user back to the add report page
28	Clicking on Cancel will close the pop-up window without choosing date and time.
29	clicking the dismiss button will redirect the user to the homepage

Table 4.5.5

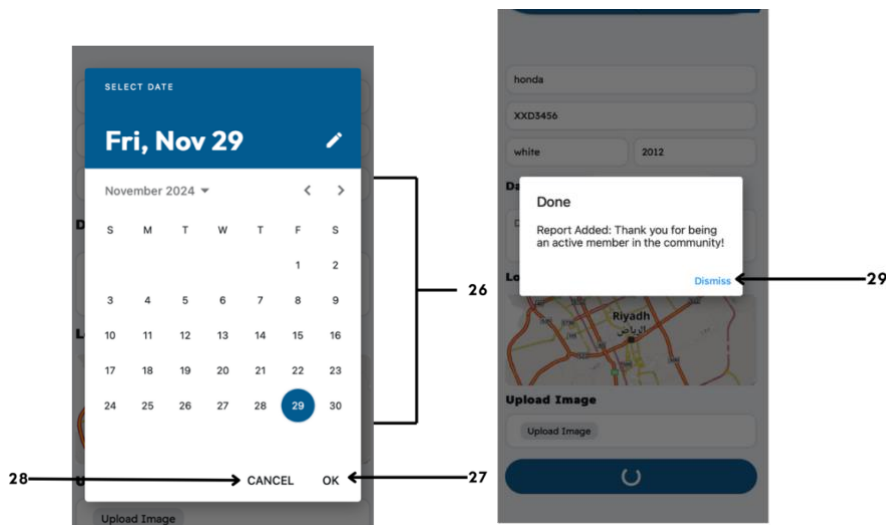


Figure 4.5.7

Figure 4.5.8

6. View report(if the user clicks on # 14)

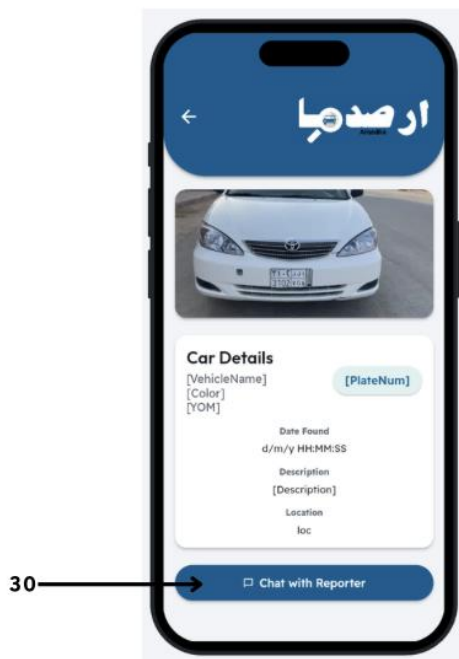


Figure 4.5.9

#	Description
30	“chat with reporter” button directs the user to the private chat page

Table 4.5.6

7. Chat page (if the user clicks on # 30)

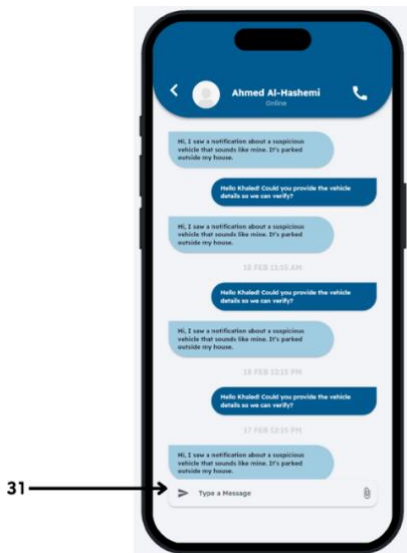


Figure 4.5.10

#	Description
31	The user can privately chat with the person that added the report

Table 4.5.7

8. User profile page (if the user clicks on #18)



Figure 4.5.11

#	Description
32	The user's information is displayed for them
33	My report button that will direct the user to my reports page
34	Logout button will log the user out from the app and direct the user to the welcome page

Table 4.5.8

9. User Reports page (if the user clicks on #33)



Figure 4.5.12

#	Description
35	The edit button will direct the user to the edit report page
36	The delete button will delete the vehicle selected and a pop- window will show a confirmation message
37	The cancel button will close the pop-up window without deleting
38	The proceed button will delete the vehicle

Table 4.5.2Table

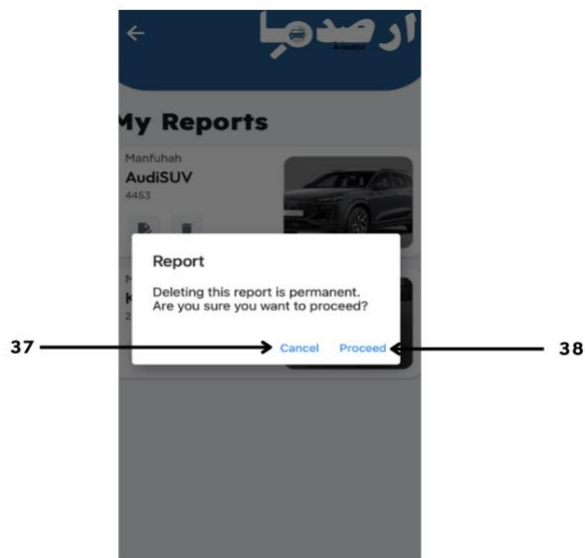


Figure 4.5.13

10. Edit Report (if the user clicks on #35)



Figure 4.5.14

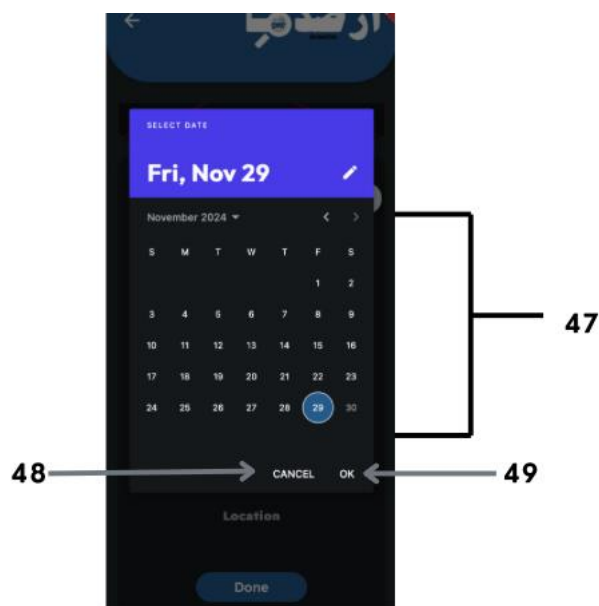


Figure 4.5.15

#	Description
40	The user can edit the vehicle name
41	The user can edit the vehicle color
42	The user can edit the YOM (year of manufacture)
43	The user can edit the vehicle plate number
44	The found button will change the status of the vehicle and remove it from the homepage when turned on
45	The user can edit the vehicle date and time reported
46	The user can edit the vehicle description
47	The user has the ability to view and select. date to modify
48	.Clicking on Cancel will close the pop-up window without choosing date and time.
49	Clicking on Ok will drive the user back to the add report page
50	The user has the ability to view and select time
51	Clicking on Cancel will close the pop-up window without choosing time.
52	Clicking on Ok will close the pop-up window with choosing the date and time.
53	Clicking on Done will close the pop-up window with the changes applied

Table 4.5.44.5.50



Figure 4.5.16

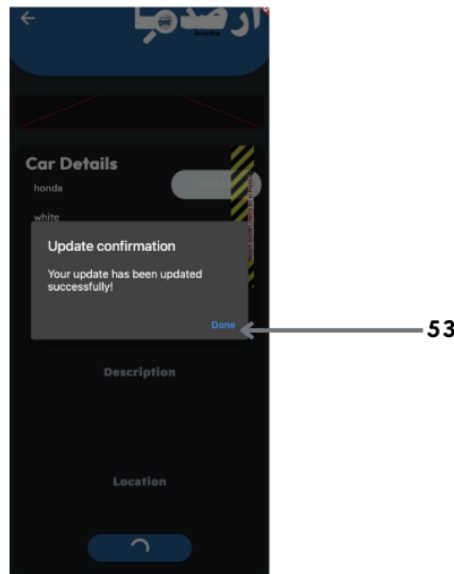


Figure 4.5.17

11. Notification page(if the user clicks on #12)

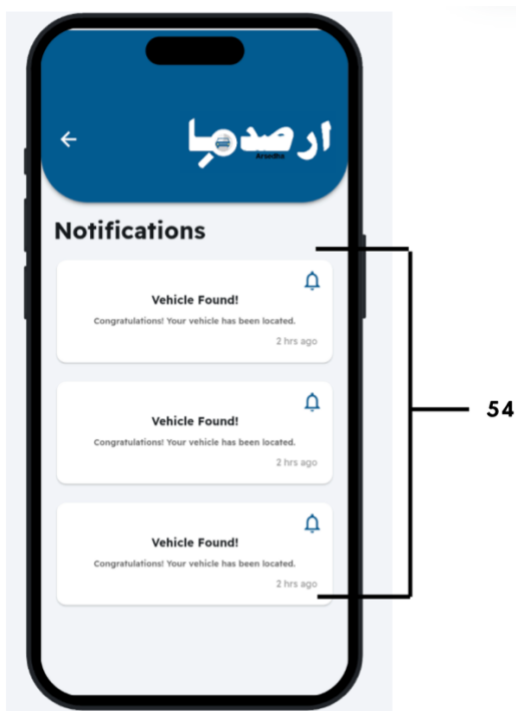


Figure 4.5.18

#	Description
54	Displays all notifications to the user

Table 4.5.64.5.71

12. Chats page(if the user clicks on #13)

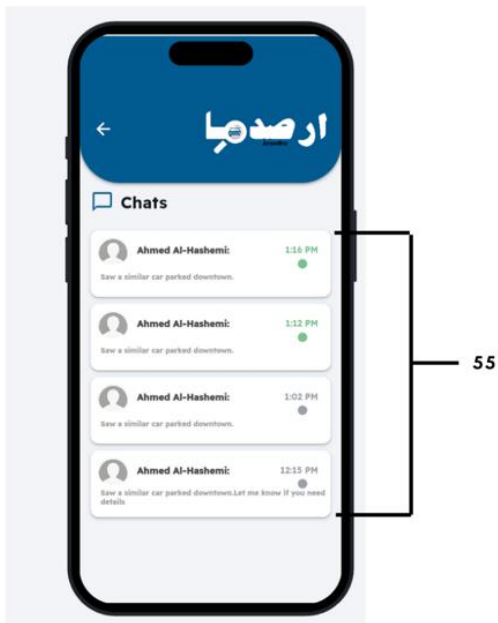


Figure 4.5.19

#	Description
55	Displays all chats specific to the user

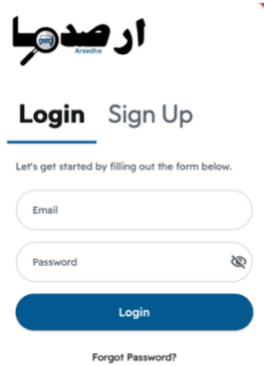
Table 4.5.84.5.92

Error Message:

1. Sign up with unmatched password

Figure 4.5.20

2. Log in with the wrong email format



ارصديا Arasidha

Login Sign Up

Let's get started by filling out the form below.

Email

Password

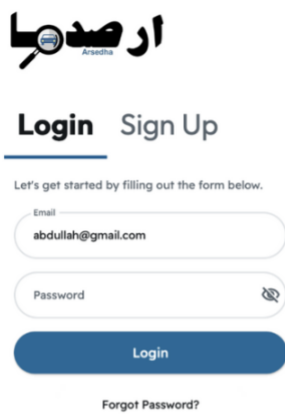
Login

Forgot Password?

Error: The email address is badly formatted.

Figure 4.5.21

3. Logging in without a password



ارصديا Arasidha

Login Sign Up

Let's get started by filling out the form below.

Email

abdullah@gmail.com

Password

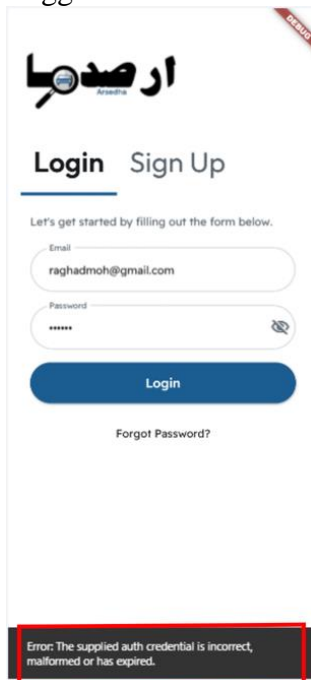
Login

Forgot Password?

Error: A non-empty password must be provided

Figure 4.5.22

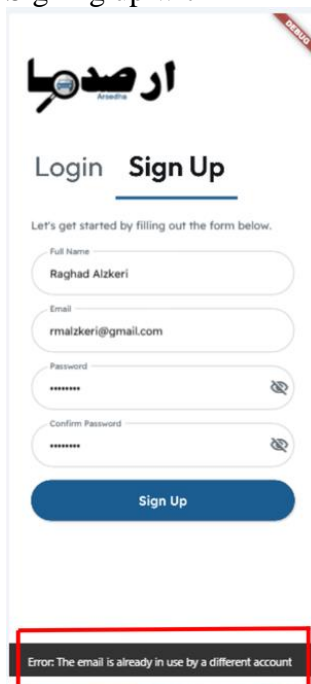
4. Loggin in with a new email



The screenshot shows the Aradia Login page. At the top, there is a logo for 'ارصدا Aradia' and a 'DEMO' badge. Below the logo, there are two tabs: 'Login' (selected) and 'Sign Up'. A message says 'Let's get started by filling out the form below.' There are two input fields: 'Email' with the value 'raghadmoh@gmail.com' and 'Password' with masked characters. A blue 'Login' button is below the fields. A link 'Forgot Password?' is also present. At the bottom, a red-bordered box contains the error message: 'Error: The supplied auth credential is incorrect, malformed or has expired.'

Figure 4.5.23

5. Signing up with an email that's already in use



The screenshot shows the Aradia Sign Up page. At the top, there is a logo for 'ارصدا Aradia' and a 'DEMO' badge. Below the logo, there are two tabs: 'Login' and 'Sign Up' (selected). A message says 'Let's get started by filling out the form below.' There are four input fields: 'Full Name' with the value 'Raghad Alzkeri', 'Email' with the value 'rmaalzkeri@gmail.com', 'Password' with masked characters, and 'Confirm Password' with masked characters. A blue 'Sign Up' button is below the fields. At the bottom, a red-bordered box contains the error message: 'Error: The email is already in use by a different account.'

Figure 4.5.24

6. Submitting a report if one of these fields is missing

Figure 4.5.25

Chapter 5: Implementation

In this section, we will outline the implementation phase of our Arsedha app. Implementation involves developing the app by constructing its database, integrating core functionalities, linking various pages, and ensuring a smooth application flow using FlutterFlow.

The implementation phase included the following key steps:

- 1- **Requirements Gathering:** We started by collecting the essential requirements to lay the foundation for the development process. This step involved understanding the business objectives, user needs, and technical specifications necessary for the app's success.
- 2- **User Interface Development:** The next step focused on designing the app's user interface. We created sketches and wireframes for various screens and functionalities to ensure an intuitive and user-friendly experience.
- 3- **Core Development Process:** This phase involved developing both the front-end and back-end components of the application:

Front-End Development:

- Used FlutterFlow's drag-and-drop builder for designing the UI without extensive coding.
- Incorporated pre-built widgets create an interactive user experience.
- Implemented page navigation for smooth transitions between screens.
- Developed forms with validation to securely collect user input (e.g., login credentials, reports) and ensure data accuracy.

Back-End Development:

- Integrated Firebase Authentication for secure user registration, login, and session management.
 - Used Firebase Database for efficient storage and retrieval of user data and reports.
 - Utilized Query Collections and filtering to display relevant data based on user input.
 - Implemented Data CRUD operations (Create, Read, Update, Delete) to allow users to manage their data seamlessly.
4. **Testing and Debugging:** During the development phase, we conducted extensive testing and debugging on both the front-end and back-end. This included user acceptance testing, user story acceptance testing, and integration testing to verify that the application functions as expected and meets all user requirements.

Implementation Challenges:

1. Retrieving and displaying the reports created by the user on the "My Reports" page. We faced difficulties in ensuring that the correct data was fetched from the database and properly linked to each user. This required setting up effective queries and ensuring proper data filtering to only show the reports associated with the logged-in user, while maintaining smooth and real-time data syncing.
2. Implementing the "Found" function for reports. Initially, we weren't sure how to effectively utilize this feature. After some consideration, we decided the best approach was to treat the "Found" status as a boolean value. When a user creates a report, the status is set to false by default. We then implemented a button that, when activated by the user, changes the status to true. This update removes the report from the homepage, ensuring that the system reflects the most accurate and up-to-date information.
3. Validating user input on the "Add Report" page. We needed to ensure that the data entered by users, such as the report details and plate number, met specific criteria before it could be submitted. This required implementing input validation checks, such as ensuring required fields (like the plate number and car name) were filled, and verifying that the plate number followed the correct format, solving this issue was crucial to ensure data accuracy and improve the overall user experience.

Our application consists of several key elements and components, including:

Front-End: Was built using FlutterFlow, leveraging its widgets and drag-and-drop tools to create an intuitive user interface. The platform's navigation system enabled seamless transitions between app pages, while dynamic features like conditional visibility and state management enhanced the user experience.

Back-End: Used FlutterFlow workflows to handle user authentication with Firebase Authentication and manage real-time data operations, ensuring smooth interaction with the database and storage.

Database: The app's database was implemented with Firebase Firestore, storing user data and reports. Real-time synchronization and security rules ensured efficient and secure data handling.

In conclusion, the implementation phase of our Arsedha application involved several steps and challenges to ensure a smooth and efficient operation. The result is a reliable and seamless vehicle theft reporting app that enhances both the user experience and the effectiveness of the reporting process by addressing and meeting the users' needs.

[Jira Link](#)

5 Chapter 6: Testing

In this chapter, we will carry out software testing by performing User Story Acceptance Testing, Integration Testing, and User Acceptance Testing. These tests will help ensure that the application meets its functional requirements and fulfills the user's expectations. These thorough testing methods are aimed at delivering a reliable and easy-to-use product.

5.1 User Story Acceptance Testing

We will start with User Story Acceptance Testing, where each feature is tested against the defined user stories to ensure that user needs are met. This involves checking if the acceptance criteria for each user story are satisfied.

First, we prepared the user stories to be tested and then conducted the tests with real users from our target group in a controlled environment. During the testing, we observed the users to ensure that the acceptance criteria were met.

We tested all relevant user stories, including those related to signing up, logging in, logging out, adding a report, viewing reports, searching, editing reports, deleting reports, and marking reports as found. We also tested non-functional requirements like speed and availability. Detailed information about the tested user stories and their acceptance criteria will be provided in the following table

Table 5.1.1: User Story Acceptance Testing

Sprint Number	User story	Acceptance criteria	Test action(s)	Pass?	Comments
2	As a user, I want to sign up and create an account so that I can access the app and take advantage of its features.	<ul style="list-style-type: none"> When I go to the sign-up page and enter my details—like my name, age, email, password (at least 8 characters long), and phone number—and click "Sign Up," the system should check if I'm already registered. If I'm a new user, I should see a confirmation message and be taken to the Sign up page so I can start using the app. If I've already signed up, the system should show a message asking me to log in instead. if I forget to fill in any required fields, the system should let me know what's missing and prompt me to complete the form before proceeding. 	<p>1. Navigate to the sign-up page.</p> <p>2. Fill in the registration form with:</p> <ul style="list-style-type: none"> - Name - Email - Password <p>3. If all details are entered correctly, click on the "Sign Up" button.</p> <p>4. Verify:</p> <ul style="list-style-type: none"> - If the user is already registered, a message asking the user to log in appears. - If the user is not registered, an error message is displayed, and moves to the sign up page. <p>5. Leave one or more required fields empty and click "Sign Up" to check if the system prompts the user to complete the missing fields.</p>	yes	<ul style="list-style-type: none"> - The sign-up process is functional and user-friendly. - The system accurately identifies whether the user is new or already registered. - Validation for required fields works correctly, prompting users to complete missing fields before proceeding.
2	As a user, I want to log in using my username and password so that the system can verify my identity, allowing me to access my account and personal information.	<ul style="list-style-type: none"> If I navigate to the login page and input my username and password correctly, then after clicking the "Log in" button, I should be directed to the home page and view my data. 	<ul style="list-style-type: none"> - Navigate to the login page. - Perform the following actions to test the scenarios: <p>1. Enter a valid username and password, then click the "Log in" button:</p>	yes	<ul style="list-style-type: none"> - The login process is straightforward and intuitive. - The system correctly validates user credentials, ensuring secure access. - Error messages for incorrect

		<ul style="list-style-type: none"> If I enter an incorrect username or password and click "Log in," the system should display an error message indicating that the credentials are incorrect. If I correctly enter my username and password and press "Log in," the system should load my account and personal data within five seconds. 	<p>- Verify that the user is redirected to the home page.</p> <p>- Confirm that the user's account and personal data are displayed correctly.</p> <p>2. Enter an incorrect username or password, then click the "Log in" button:</p> <p>- Verify that an error message is displayed indicating that the credentials are incorrect.</p> <p>3. Enter a valid username and password, click the "Log in" button, and measure the time:</p> <p>- Verify that the system loads the user's account and personal data within five seconds.</p>		<p>credentials are clear and helpful.</p> <p>- The account data loads quickly, meeting the performance requirement of under five seconds.</p>
2	As a user, I want to be able to log out of my account so that I can protect my personal information and ensure my account's security	<ul style="list-style-type: none"> As a logged-in user, when I click the "Logout" button in the app, I should be successfully signed out of my account. After logging out, if I attempt to access any restricted pages or features, I should be redirected to the login page, showing that I no longer have access until I sign in again. 	<p>1. Log Out:</p> <p>- Log in to the application using valid credentials.</p> <p>- Click on the "Logout" button.</p> <p>- Verify that the user is successfully signed out and redirected to the login page.</p> <p>2. Restricted Access After Logout:</p> <p>- Attempt to access restricted pages or features without logging back in.</p> <p>- Verify that the system redirects the user to the login page, denying access to restricted content.</p>	yes	<p>- The logout functionality works effectively and ensures the user is securely signed out.</p> <p>- The system correctly prevents access to restricted pages or features after logging out.</p> <p>- Redirects to the login page provide a clear and user-friendly way to regain access.</p>

2	As a registered user, I want to add a report for a stolen vehicle so that I can aid in recovering stolen vehicles	<ul style="list-style-type: none"> The user can access the "Add Report" feature from the main menu. The user must log in to their account to access the reporting feature. The report form includes fields for: <ul style="list-style-type: none"> Vehicle make Vehicle Model Year of manufacture Color License plate number Date and time of the incident Location where the vehicle was stolen Additional details or description (optional) The user can submit the report after filling in the required fields. Upon submission, the user receives a confirmation message indicating the report has been successfully submitted. The report is stored in the user's account and can be accessed later. <p>The report is visible to the community, allowing other users to see and potentially assist in the recovery of the stolen vehicle.</p>	<p>1. Access "Add Report" Feature:</p> <ul style="list-style-type: none"> - Log in to the application with valid credentials. - Navigate to the main menu and select "Add Report" - Verify that the "Add Report" form is accessible only to logged-in users. <p>2. Fill in the Report Form:</p> <ul style="list-style-type: none"> - Fill in the following required fields: <ul style="list-style-type: none"> - Vehicle name (make/model) - Year of manufacture - Color - License plate number - Date and time of the incident - Location where the vehicle was stolen - Optionally fill in the "Additional details or description" field. - Verify that all required fields are validated, and the form does not proceed if any required field is left blank. <p>3. Submit the Report:</p> <ul style="list-style-type: none"> - Submit the report after completing all required fields. - Verify that a confirmation message appears, indicating that the report has been successfully submitted. <p>4. Check that the Report is stored:</p> <ul style="list-style-type: none"> - Verify that the submitted report is stored in the user's 	yes	<ul style="list-style-type: none"> - The "Add Report" is easily accessible and intuitive for logged-in users. - Required field validation ensures accurate and complete data entry. - Confirmation messages provide clear feedback upon successful report submission.
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			account and accessible for review or updates later. 5. Community Visibility: - Log in as a different user and check the community section to verify that the report is visible to other users.		
2	As a registered user, I want to view stolen vehicle reports so that I can identify details of stolen vehicles and privately chat with the user who added the report.	<ul style="list-style-type: none"> The user can access the "View Reports" feature from the home page All registered users can see a list of all reports submitted by others, displaying basic information such as: <ul style="list-style-type: none"> Vehicle make Vehicle Model Year of manufacture Color License plate number Date and time of the incident Location where the vehicle was stolen Additional details or description provided by the reporting user. When a user taps on a report, they can view detailed information Users have the option to initiate a private chat with the user who submitted the report. Users can filter or search reports based on criteria such as date, vehicle make, or location. 	1. Access the "View Reports" Feature: - Log in to the application with valid credentials. - Verify that the list of reports is accessible to all registered users. 2. View List of Reports: - Verify that the list displays the following basic information for each report: - Vehicle name (make/ Model) - Year of manufacture - Color - License plate number - Date and time of the incident - Location where the vehicle was stolen - Additional details or description . 3. View Report Details: - Tap on a report from the list. - Verify that detailed information about the selected report is displayed.	yes	- The "View Reports" feature is user-friendly and displays relevant information clearly. - The ability to tap on reports for detailed information and initiate private chats enhances user interaction and collaboration.

		<ul style="list-style-type: none"> Reports are updated in real-time as new reports are added or existing reports are resolved. 			
2	As a registered user, I want to search for specific vehicles by their license plate number, so that I can quickly find and track reports on stolen vehicles.	<ul style="list-style-type: none"> When a user accesses the vehicle search section, a search field should be displayed, allowing the input of a vehicle's license plate number. Upon submitting a search query, the system should process the request and display a list of vehicles that match or are closely related to the entered license plate number. The search results should prioritize exact matches or similar license numbers, ensuring that the relevant vehicle information is prominently displayed. If no vehicles match the search criteria, the system should notify the user that no results were found. 	<p>1. Access the Vehicle Search Section:</p> <ul style="list-style-type: none"> - Log in to the application using valid credentials. - Navigate to the "Search" section for vehicles. - Verify that a search field for entering a car's name is displayed. <p>2. Perform a Search:</p> <ul style="list-style-type: none"> - Enter a car name into the search field. - Submit the search query. - Verify that the system processes the request and displays the following: <ul style="list-style-type: none"> - A list of vehicles with car names that match or are closely related to the entered query. - Ensure that exact matches are displayed at the top of the list, followed by similar names. <p>3. Test No Matches Found:</p> <ul style="list-style-type: none"> - Enter a car name that does not exist in the database. - Submit the search query. <p>4. Check Search Accuracy:</p> <ul style="list-style-type: none"> - Test with partial car names to verify that the system provides results for similar matches. - Verify that the relevant vehicle 	yes	<ul style="list-style-type: none"> - The search feature is efficient and user-friendly, allowing quick access to specific vehicle reports. - The system prioritizes exact matches for car names, making it easy to find the correct report.

			information is prominently displayed for each result.		
2	As a registered user, I want to edit my existing suspicious vehicle report if I realize the information (e.g., location, description, or license plate) is incorrect, so that I can provide accurate and updated details for the community.	<ul style="list-style-type: none"> When a user accesses the "My Reports" section, the system should display a list of their submitted reports, with an option to edit each report. Upon selecting the edit option for a specific report, the system should display the current details of the report, including fields for the license plate number, vehicle description, location, and other. The system should allow the user to modify any of the displayed fields (e.g., updating the location or correcting the license plate number). After submitting the changes, the system should validate the input and update the report details if the modified information is valid. <p>If the report is successfully updated, the system should display a confirmation message indicating that the changes have been saved.</p>	<p>1-Go to the "My Reports" page.</p> <p>2-Verify that an "edit" button is available for each report.</p> <p>3-Click on the "edit" button for a specific report.</p> <p>4-Verify that the current details (e.g., license plate, vehicle description, and location) are displayed.</p> <p>5-Choose new details (e.g., update the location or correct the license plate number).</p> <p>6-Submit the changes and verify the report is updated.</p>	Yes	
2	As a registered user, I want to delete my submitted report if I realize there is incorrect information about	<ul style="list-style-type: none"> When a user accesses the "My Reports" page, the system should display a list of their submitted reports 	<p>1- Open the "My Reports" page to find the list of reports you've submitted.</p> <p>2- Click the delete button next to a specific report.</p>	Yes	

	the vehicle or if the vehicle is not actually stolen, so that the system only contains accurate and relevant reports.	<p>with an option to delete each report.</p> <ul style="list-style-type: none"> If the user realizes that the information in a report is incorrect or that the vehicle is not stolen, they should be able to select the delete option for that report. Upon selecting the delete option, the system should prompt the user to confirm the deletion. If the user confirms the deletion, the system should remove the report from the system and display a confirmation message indicating that the report has been successfully deleted. <p>If the user cancels the deletion, the system should retain the report without any changes.</p>	<p>3- Verify that a pop-up message appears with two options: 'Proceed' and 'Cancel'.</p> <p>4- Click the 'Cancel' option in the pop-up message.</p> <p>5- Verify that the pop-up message disappears, and the report remains in the system and on the "My Reports" page.</p> <p>6- Click the delete button next to the same report again.</p> <p>7- Click the 'Proceed' option in the pop-up message.</p> <p>8- Verify that the pop-up message disappears, and the report is removed from the system and "My Reports" page.</p>		
2	As a registered user, who issued the report I should be able to change the stolen vehicle status to found after conforming that it was recovered, so the system updates the status and removes it from the list of active stolen vehicles.	<ul style="list-style-type: none"> When the original user who reported the stolen vehicle views their report, they should see a "Found" button on the report page. Clicking the "Found" button should update the vehicle's status to "Found" in the system. The system should notify all relevant users (including the original reporter) that the vehicle has been marked as "Found." 	<p>1- Open the "My Reports" page to view your submitted stolen vehicle reports.</p> <p>2- Click on a specific report to view the details of the stolen vehicle.</p> <p>3- Verify that a "Found" button is available on the report page for the vehicle you reported.</p> <p>4- Click the "Found" button to mark the vehicle as recovered.</p> <p>5- Verify that the vehicle's status is updated to</p>	Yes	

		<ul style="list-style-type: none"> After the vehicle is marked as "Found," it should be automatically removed from the list of active stolen vehicles. <p>If the user is not logged in, the system should prompt them to log in before allowing them to mark the vehicle as "Found."</p>	<p>"Found" in the system.</p> <p>6- Verify that the vehicle is removed from the list of active stolen vehicles after being marked as "Found."</p>		
2	As a user, I want the app to load stolen vehicle reports quickly so that I don't have to wait for the details to show up.	When I view a stolen vehicle report, the details should load in less than 40 seconds.	<p>1- Open the home page of the app.</p> <p>2- Click on the "View" button to load the stolen vehicle report details.</p> <p>3- Verify that the results are displayed within 40 seconds.</p>	Yes	Loading time are within the expected range
2	As a user, I want the app to be available almost all the time so that I can report or search for stolen vehicles whenever I need to.	The app should be accessible 99% of the time over a 24-hour period to ensure its reliable and always ready when needed	<p>1- Open the app 24 times throughout the day.</p> <p>2- Make sure the app works at least 23 times to meet the 99% uptime goal.</p>	Yes	-

5.2 Integration Testing

In this section, we will focus on integration testing, which looks at how different parts of the system work together when combined.

Integration testing is done whenever a new component is added to the system. It checks how well the individual parts connect and communicate with each other. The goal is to make sure all components of the application function properly together, providing a smooth and cohesive experience for the user.

5.2.1 Integration Hierarchy

In this sub-section, we will introduce the "Arsedha" integration hierarchy diagram, which illustrates the structure and order in which different components of the system are combined and tested to create the "Arsedha" application.

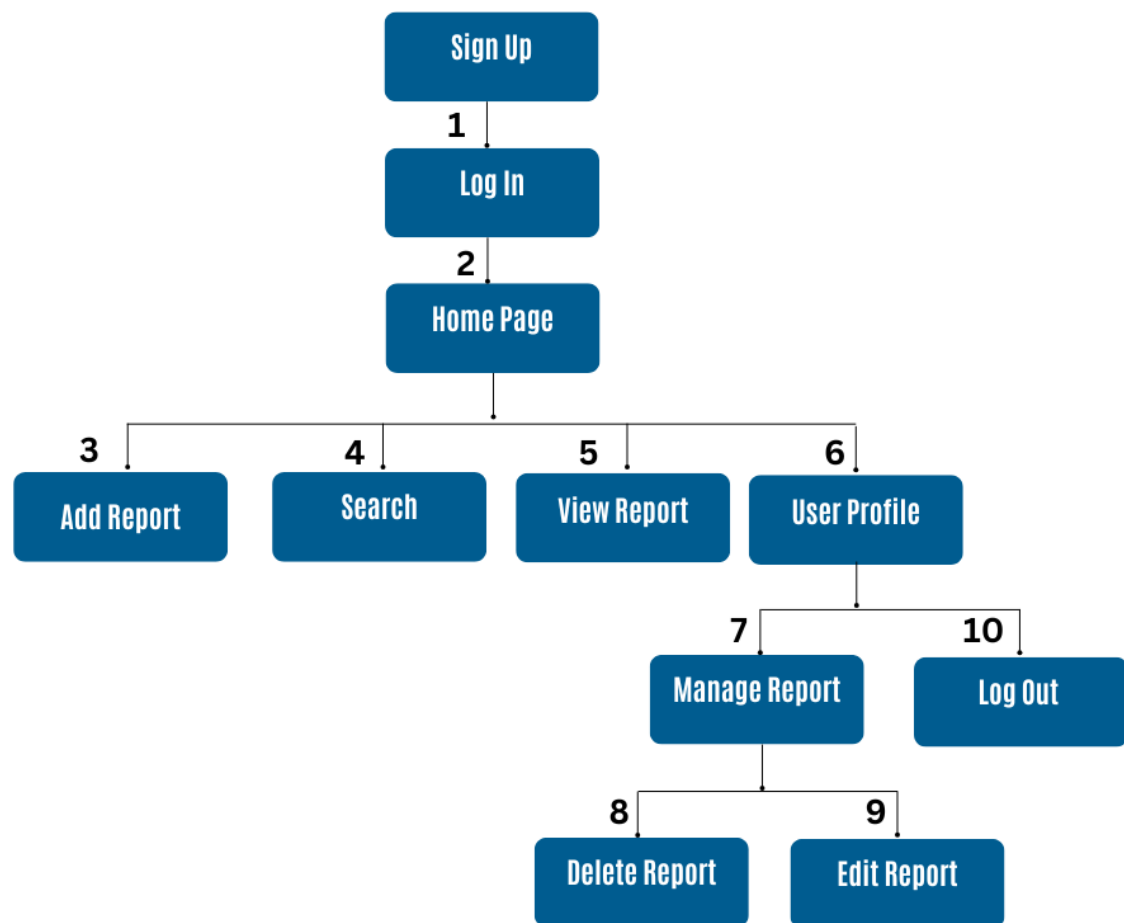


Figure 5.2.1: Integration hierarchy.

5.2.2 Integration Testing Plan

In this sub-section, we will present the integration testing plan table, which is designed to verify that the system components work correctly with the newly added components. The table will include test cases related to these components, along with indications of whether or not they pass the tests.

Table 5.2.1: Integration Testing

System components	New component	Test case	Pass?	Comments
- Sign up to the system	Log in to the system	1. A new user successfully signed up. 2. The signed-up user logged in to the system	Yes	-
- Sign up to the system - Log in to the system	Home Page	1. A new user successfully signed up. 2. The signed-up user logged in to the	Yes	-

		system 3. The system navigated to the Home Page after login.		
<ul style="list-style-type: none"> - Sign up to the system - Log in to the System - Home Page 	Add Report	<ol style="list-style-type: none"> 1. A new user successfully signed up. 2. The signed-up user logged in to the system 3. The system navigated to the Home Page after login. 4. The user selected the Add Report button. 	Yes	
<ul style="list-style-type: none"> - Sign up to the system - Log in to the System - Home Page - Add Report 	Search	<ol style="list-style-type: none"> 1. A new user successfully signed up. 2. The signed-up user logged in to the system 3. The system navigated to the Home Page after login. 4. The user selected the Add Report button. 5. The user selected the Search option. 	Yes	
<ul style="list-style-type: none"> - Sign up to the system - Log in to the System - Home Page - Add Report - Search 	View Report	<ol style="list-style-type: none"> 1. A new user successfully signed up. 2. The signed-up user logged in to the system 3. The system navigated to the Home Page after login. 4. The user selected the Add Report button. 5. The user selected the Search option. 6. The user selected the View Report option. 	Yes	
<ul style="list-style-type: none"> - Sign up to the system - Log in to the System 	User Profile	<ol style="list-style-type: none"> 1. A new user successfully signed up. 2. The signed-up user logged in to the 	Yes	

<ul style="list-style-type: none"> - Home Page - Add Report - Search - View Report 		<p>system</p> <ol style="list-style-type: none"> 3. The system navigated to the Home Page after login. 4. The user selected the Add Report button. 5. The user selected the Search option. 6. The user selected the View Report option. 7. A user navigated to the User Profile. 		
<ul style="list-style-type: none"> - Sign up to the system - Log in to the System - Home Page - Add Report - Search - View Report - User Profile 	Mange Report	<ol style="list-style-type: none"> 1. A new user successfully signed up. 2. The signed-up user logged in to the system 3. The system navigated to the Home Page after login. 4. The user selected the Add Report button. 5. The user selected the Search option. 6. The user selected the View Report option. 7. A user navigated to the User Profile. 8. The user selected the Manage Report option. 	Yes	
<ul style="list-style-type: none"> - Sign up to the system - Log in to the System - Home Page - Add Report - Search - View Report - User Profile - Mange Report 	Delete Report	<ol style="list-style-type: none"> 1. A new user successfully signed up. 2. The signed-up user logged in to the system 3. The system navigated to the Home Page after login. 4. The user selected the Add Report button. 5. The user selected the Search option. 6. The user selected the View Report option. 7. A user navigated to the User Profile. 	Yes	

		<ol style="list-style-type: none"> The user selected the Manage Report option. The user selected a report and deleted it successfully. 		
<ul style="list-style-type: none"> Sign up to the system Log in to the System Home Page Add Report Search View Report User Profile Mange Report Delete Report 	Edit Report	<ol style="list-style-type: none"> A new user successfully signed up. The signed-up user logged in to the system The system navigated to the Home Page after login. The user selected the Add Report button. The user selected the Search option. The user selected the View Report option. A user navigated to the User Profile. The user selected the Manage Report option. The user selected a report and deleted it successfully The user selected a report and edited it successfully. 	Yes	
<ul style="list-style-type: none"> Sign up to the system Log in to the System Home Page Add Report Search View Report User Profile Mange Report Delete Report Log Out 	Log Out	<ol style="list-style-type: none"> A new user successfully signed up. The signed-up user logged in to the system The system navigated to the Home Page after login. The user selected the Add Report button. The user selected the Search option. The user selected the View Report option. A user navigated to the User Profile. The user selected the Manage Report option. 	Yes	

		9. The user selected a report and deleted it successfully 10. The user selected a report and edited it successfully 11. The user selected Log Out and exited the system.		
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5.3 User Acceptance Testing

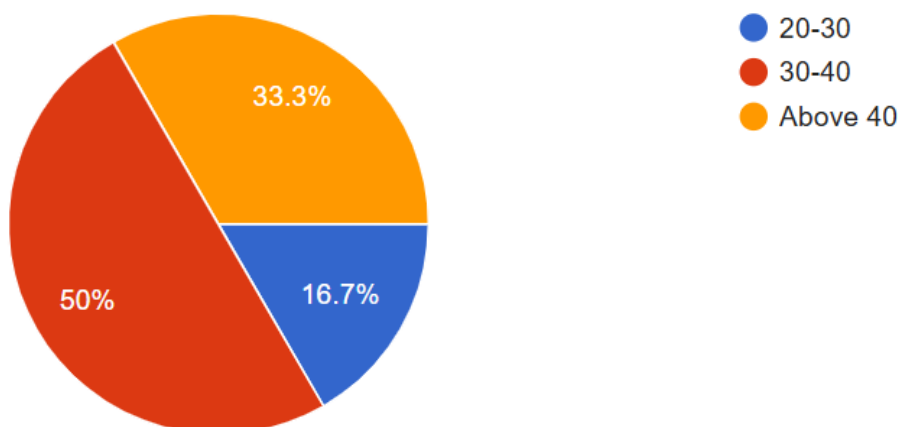
To complete this test, we recruited 6 end users who had basic knowledge of using mobile applications and met the characteristics of our target users, such as having at least an intermediate school diploma. We provided them with a scenario that covers all the functionality of the app, including registering, logging in, adding and deleting vehicle reports, exploring and viewing displayed reports, and editing a report. Before running the test, we gave users five minutes to explore the app and then asked them to run the test using the provided scenario. We collected their feedback through a questionnaire that asked them to rate their experience with the app and identify any areas for improvement.

5.3.1 Demographics of participants

[Figure 5.3.1.1: Demographic of acceptance testing participations]

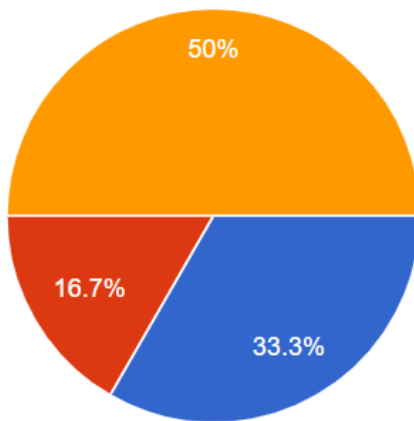
What is your age

6 ردود



What is your monthly income rang

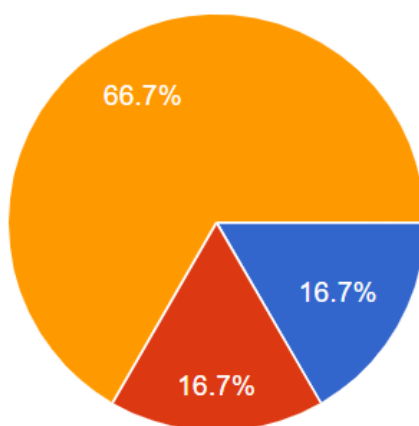
6 ردود



- 2,000–5,000 SAR
- 5,000–10,000 SAR
- 10,000 SAR and Above

What is your highest level of education

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- Middle School
- High School
- Bachelor

5.3.2 Questionnaire

Questionnaire Questions:

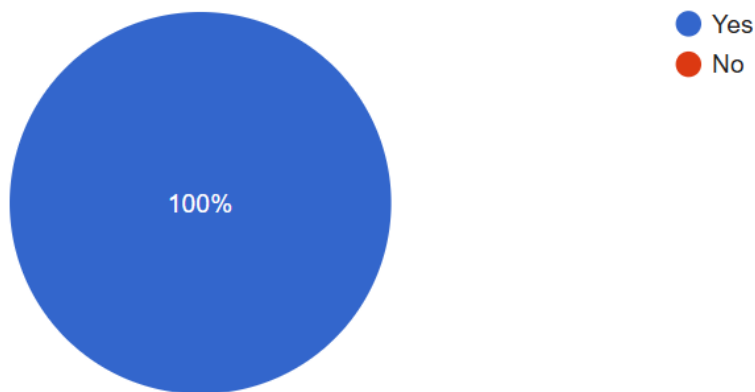
- The process of Signing up and signing into the app is clear
- I was able to complete the test scenario without difficulties
- It was easy to navigate through the different sections of the app
- I can find the information that I need easily
- I will use the app again in the future. do you thing is good

Questionnaire Answers:

[Figure 5.3.2.1:Answers to questionnaire questions for acceptance testing]

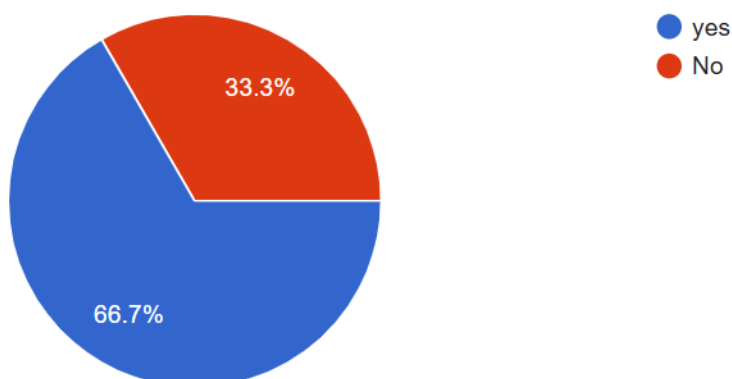
The process of Signing up and signing into the app is clear

6 ردود



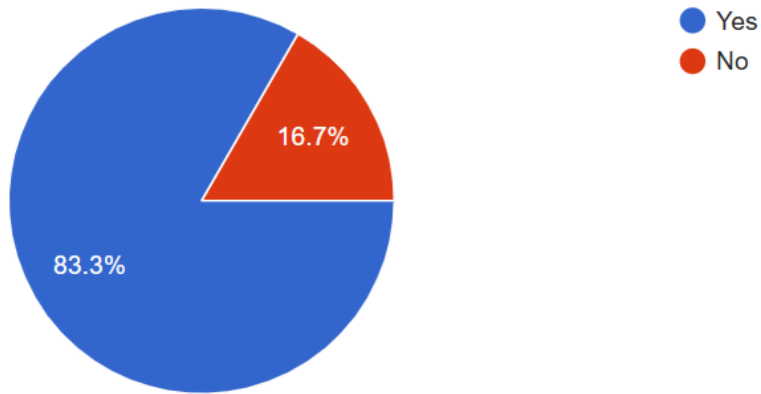
I was able to complete the test scenario without difficulties

6 ردود



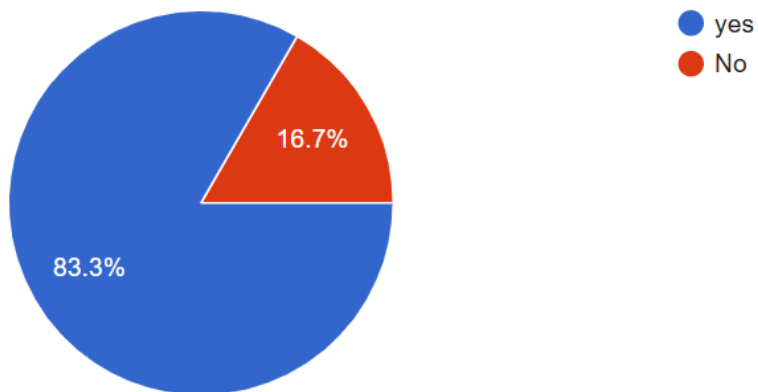
It was easy to navigate through the different sections of the app

6 ردود



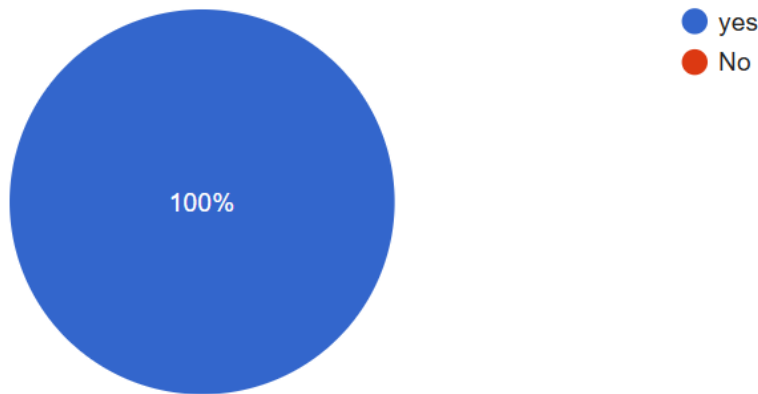
I can find the information that I need easily

6 ردود



I will use the app again in the future. do you thing is good

6 ردود



6 Chapter 7: Conclusion and Future Work

6.1 Conclusion feedback findings

The Arsedha أرصدها document provides a structured overview of the app, addressing the problem of vehicle theft in Riyadh with a community-driven solution. It details the app's vision, objectives, and scope, alongside a domain analysis that highlights user needs and competitive gaps. Strengths include a well-defined use case diagram and product backlog.

A critical issue is the lack of robust security measures, exposing sensitive user data such as the exact location where the vehicle was found without proper protection. Additionally, users should be able to easily navigate back to the home page for a seamless experience. Another limitation is that users currently cannot update the vehicle image, which restricts their ability to provide the most accurate and updated information.

Through this journey, we have gained valuable insights into software development, particularly the importance of aligning technical features with user expectations. We learned the significance of conducting thorough domain analysis to design a user-centered product, as well as the challenges of balancing functionality with robust security measures. This experience also underscored the need for iterative testing and feedback to refine and improve the system.

While the document outlines a promising solution, resolving security vulnerabilities and enhancing user functionality are vital for building trust and ensuring the app's effectiveness. With these improvements, Arsedha أرصدها can become a significant tool in combating vehicle theft and fostering community collaboration.

6.2 Future Work

In the future, Arsedha أرصدها aims to enhance user experience and functionality by introducing dark/light mode switching and full Arabic language support to cater to diverse user needs. Existing features like chat and notifications, currently static, will be made fully functional. Security and performance improvements will be prioritized, and location features will be enhanced to provide area-based information without revealing exact locations for user safety. The app will also be optimized for cross-platform use and aim to expand its reach by collaborating with the Riyadh Police Department and eventually scaling across all regions of Saudi Arabia, extending its impact beyond Riyadh.

7 References

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8 Appendix A: Interview

This appendix includes all the materials related to the interviews, such as the questions we asked and the transcriptions of the conversations.

- Interview Questions:

Q1: What do you think is the most effective way to report a stolen vehicle?

Q2: What challenges do you think people face when trying to report a stolen vehicle in Riyadh?

Q3: How do you think community involvement can help in recovering stolen vehicles?

Q4: If you had to manage a stolen vehicle report, what features would you want in the app for easy management?

Q5: What do you think could encourage more people to report stolen vehicles using an app like Arsedha?

- Interview's Transcriptions:

The transcripts of the interviews represent golden literature in that they hold detailed records of conversations between the interviewers and interviewees. They include all vital information, such as the name of participants, interview place, time and date, objectives, agenda, observations, and topics not covered. Each transcript contains five interesting questions and responses from the interviewees that will provide keen insights and analysis. In sum, these transcriptions will represent a cornucopia of knowledge to help experts understand the perspectives and experiences shared during interviews.

Online Interview(1)

Interviewee: Abdulmalik	Interviewer: Ghada
Location/Medium: Abdulmalik's House	Appointment Date: 2 October Start Time: 2:00 PM End Time: 2:55 PM
Objectives: <ul style="list-style-type: none"> Understand people's views on vehicle theft and how they currently report stolen cars. Gather information about the challenges people face when trying to recover stolen vehicles. 	Reminders: <p>The interviewee has previously experienced vehicle theft and encountered challenges in reporting it.</p>
Agenda: <p>Introduction Background in Project Overview of the Interview Topic to be covered Permission to Record Question1 Question2 Question3 Question4 Question5 Summary of Major Points Questions from interviewee Closing</p>	Approximate Time: <p>4min 6min 3min 2min 40sec 5min 4min 6min 5min 6min 3min 7min 3min</p>
General Observations <p>The interviewee understood the Arsedha concept and was enthusiastic about it, showing interest in community-driven solutions for vehicle theft recovery.</p>	
Topic Not Covered <p>We didn't have time to discuss the interviewee's thoughts on integrating the app with law enforcement systems.</p>	

Figure 6.2.1: Interview's Transcription for first Interview.

Online Interview(1)

Interviewee: Abdulmalik	Date: 2 October
Questions:	Answers and Notes:
Q1: What do you think is the most effective way to report a stolen vehicle?	<p>My opinion is that the fastest and easiest way to report a stolen vehicle is to use a mobile app. It should have features that ensure that users can instantly report by merely providing the number of the license plate and the last location where it was seen. This means that it is fast and reduces the amount of time each person would need to be involved.</p> <p>Observations: The interviewee stressed the promptness of a simple reporting process saying that the app's usability is absolute for the app to be effective.</p>
Q2: What challenges do you think people face when trying to report a stolen vehicle in Riyadh?	<p>The biggest issue was not getting timely updates from the police. It felt like my report wasn't a priority.</p> <p>Observations: The interviewee's frustration indicates the need for stronger communication in reporting.</p>
Q3: How do you think community involvement can help in recovering stolen vehicles?	<p>Community involvement can be crucial; if people share information quickly and work together, it increases the chances of finding stolen vehicles.</p> <p>Observations: The interviewee recognized the importance of community support, indicating that collective efforts could significantly improve recovery rates.</p>
Q4: If you had to manage a stolen vehicle report, what features would you want in the app for easy management?	<p>The app should allow users to easily update, delete, or add details to their reports, along with a clear way to communicate with other users involved.</p> <p>Observations: The interviewee stressed the need for user-friendly features, indicating that effective management of reports is vital for user satisfaction.</p>
Q5: What do you think could encourage more people to report stolen vehicles using an app like Arsedha?	<p>Implementing incentives, for example rewarding for sightings reporting, is a potential strategy to involve more people.</p> <p>Observations: The interviewee's suggestion for incentives indicates that engagement strategies could enhance community participation in vehicle recovery.</p>

Figure 6.2.2: Another Interview's Transcription for first Interview

Online Interview(2)

Interviewee: Abdulrahman	Interviewer: Ghada
Location/Medium: Phone Call	Appointment Date: 3 October Start Time: 8:00 PM End Time: 8:49 PM
Objectives: <ul style="list-style-type: none"> Understand people's views on vehicle theft and how they currently report stolen cars. Gather information about the challenges people face when trying to recover stolen vehicles. 	Reminders: <p>The interviewee has a general knowledge of vehicle theft but hasn't personally experienced it.</p>
Agenda: <p>Introduction Background in Project Overview of the Interview Topic to be covered Permission to Record Question1 Question2 Question3 Question4 Question5 Summary of Major Points Questions from interviewee Closing</p>	Approximate Time: <p>4min 5min 3min 2min 35sec 4min 3min 6min 5min 6min 4min 5min 2min</p>

General Observations

The interviewee was engaged and provided thoughtful responses during the call. While they hadn't personally experienced vehicle theft, they had clear opinions on the usefulness of technology in addressing the issue.

Topic Not Covered

Due to the nature of the phone call, we did not discuss the potential for user feedback mechanisms to improve app functionality.

Figure 6.2.3: Interview's Transcription for second Interview

Online Interview(2)

Interviewee: Abdulrahman	Date: 3 October
Questions:	Answers and Notes:
Q1: What do you think is the most effective way to report a stolen vehicle?	<p>The best way to report a stolen vehicle is to contact community groups or forums directly. These channels quickly spread the word and alert many people. When everyone is aware, it motivates the police to take action, increasing the chances of finding the car.</p> <p>Observations: The interviewee emphasized the power of community connections,</p>
Q2: What challenges do you think people face when trying to report a stolen vehicle in Riyadh?	<p>Confusion about the reporting process is one of the greatest issues. A lot of individuals have no clue where to start and which data to provide that subsequently leads to annoyance with filing a report.</p> <p>Observations: The interviewee's answer identifies the requirement of clearer guidelines and resources that should be handy to the individuals on the reporting process to ensure transparency.</p>
Q3: How do you think community involvement can help in recovering stolen vehicles?	<p>Community involvement is vital for recovering stolen vehicles. Quick information sharing helps locals spot stolen cars and creates a vigilant environment that discourages theft</p> <p>Observations: The interviewee pointed out that when the community stays aware and communicates well, it really boosts the chances of recovering stolen vehicles.</p>
Q4: If you had to manage a stolen vehicle report, what features would you want in the app for easy management?	<p>I'd love for the app to let users easily change or remove their reports and have a quick chat feature to connect with others involved.</p> <p>Observations:The interviewee mentioned that simple management tools are really important for keeping users engaged and satisfied with the app.</p>
Q5: What do you think could encourage more people to report stolen vehicles using an app like Arsedha?	<p>I think rewards for reporting stolen vehicles would really encourage more people to use the app. It makes them feel like they're helping out.</p> <p>Observations:The interviewee pointed out that incentives could be a great way to get more people involved in reporting</p>

Figure 6.2.4: Another Interview's Transcription for the second Interview

9 Appendix B: Questionnaires

This appendix includes everything related to the questionnaire, such as the questions we asked and the responses we gathered, presented through pie charts. [7]

- Questionnaires Questions:

1. How easy do you find it to access information about stolen vehicles in Riyadh?
 - Very easy
 - Somewhat easy
 - Difficult
 - Very difficult
2. What method do you prefer for reporting a stolen vehicle?
 - Mobile app
 - Phone call to the police
 - In-person report at the police station
 - Social media
3. How important is it for you to have a centralized app where you can view details of stolen vehicles?
 - Extremely important
 - Somewhat important
 - Not very important
 - Not important at all
4. What features do you think are essential for an app like *Arsedha*? (Select all that apply)
 - Viewing details of stolen vehicles
 - Ability to communicate with other users
 - Instant alerts for new reports
 - GPS functionality to show the last seen location
5. What challenges have you faced when trying to report or recover a stolen vehicle?
 - Lack of timely updates from authorities
 - Difficulty in finding the right reporting channels
 - Limited community support
 - Other

6. How likely are you to use an app like *Arsedha* for reporting stolen vehicles?
 - Very likely
 - Somewhat likely
 - Not likely
 - Not sure
7. What would motivate you to actively participate in using *Arsedha* for vehicle theft recovery?
 - Trust in the app's effectiveness
 - Community involvement and support
 - User-friendly design
 - Clear communication features
8. When you want to report a sighting of a stolen vehicle, what information do you think is essential to include? (Select all that apply)
 - license plate number
 - Location of the sighting
 - Time and date of the sighting
 - Description of the vehicle (color, type, etc.)
 - Contact information for follow-up
 - Any relevant details about the circumstances of the sighting
9. How do you prefer to receive notifications about new stolen vehicle reports?
 - Push notifications through the app
 - Email alerts
 - SMS text messages
 - Notifications via social media (e.g., Facebook, Twitter)

• Questionnaires Answers:

How easy do you find it to access information about stolen vehicles in Riyadh?

23 responses

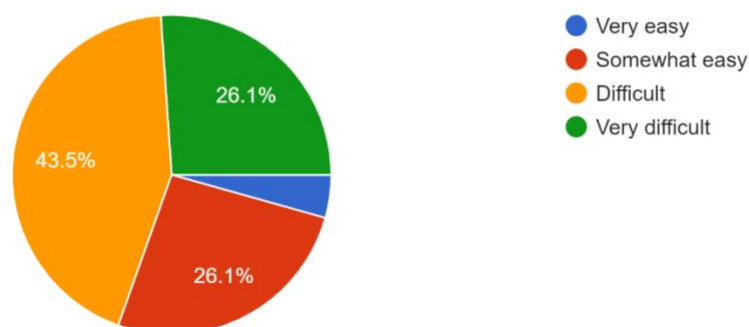


Figure 6.2.1: The pie chart of the first questionnaire question.

What method do you prefer for reporting a stolen vehicle?

23 responses

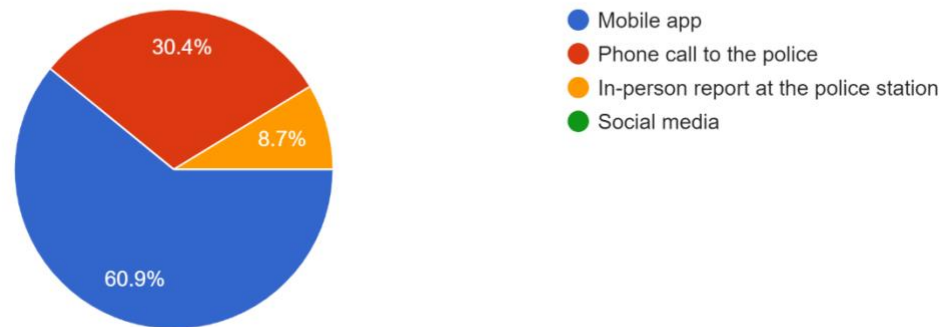


Figure 6.2.2: The pie chart of the second questionnaire question.

How important is it for you to have a centralized app where you can view details of stolen vehicles?

23 responses

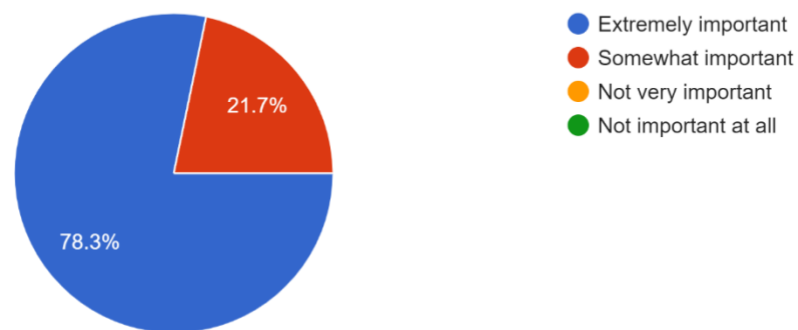


Figure 6.2.3: The pie chart of the third questionnaire question.

What features do you think are essential for an app like Arsedha? (Select all that apply)

23 responses

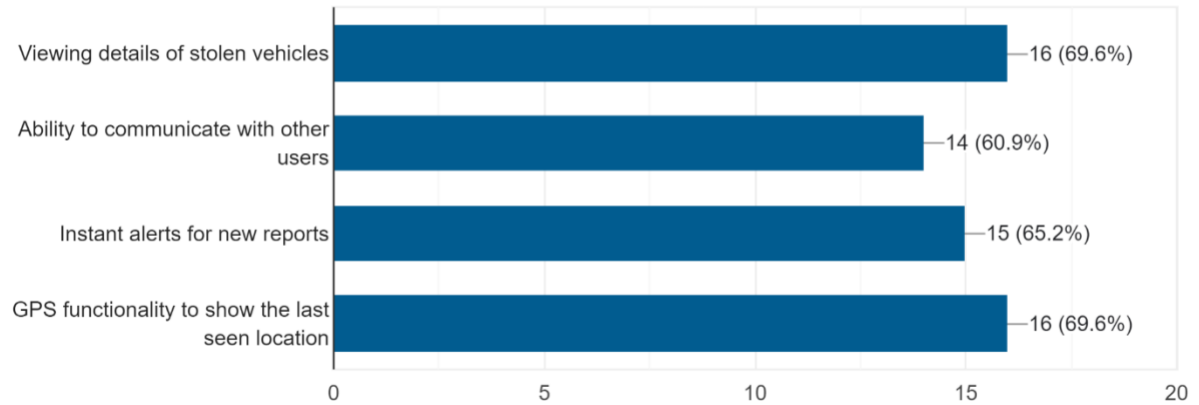


Figure 6.2.4: The Bar chart of the forth questionnaire question.

What challenges have you faced when trying to report or recover a stolen vehicle?

23 responses

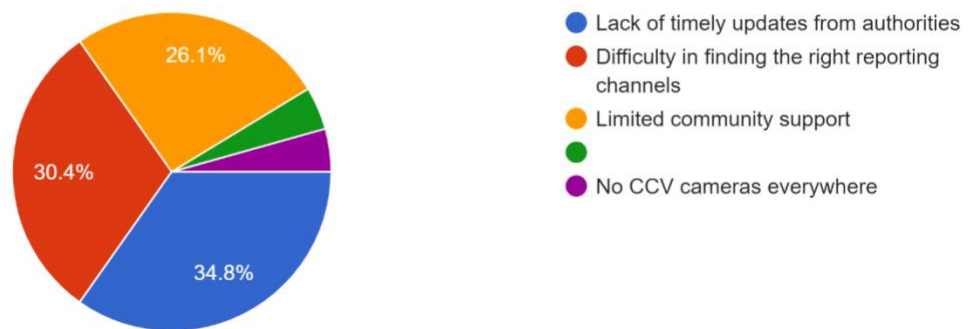


Figure 6.2.5: The pie chart of the fifth questionnaire question.

How likely are you to use an app like Arsedha for reporting stolen vehicles?

23 responses

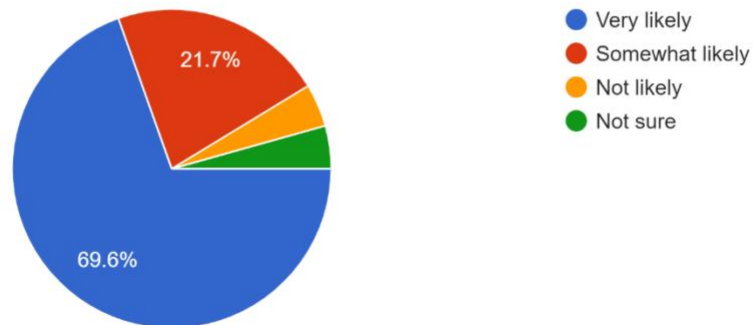


Figure 6.2.6: The pie chart of the sixth questionnaire question.

What would motivate you to actively participate in using Arsedha for vehicle theft recovery?

23 responses

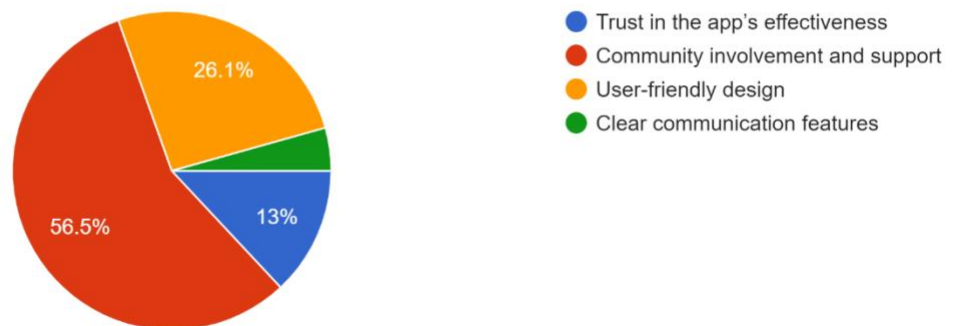


Figure 6.2.7: The pie chart of the seventh questionnaire question.

When you want to report a sighting of a stolen vehicle, what information do you think is essential to include? (Select all that apply)

23 responses

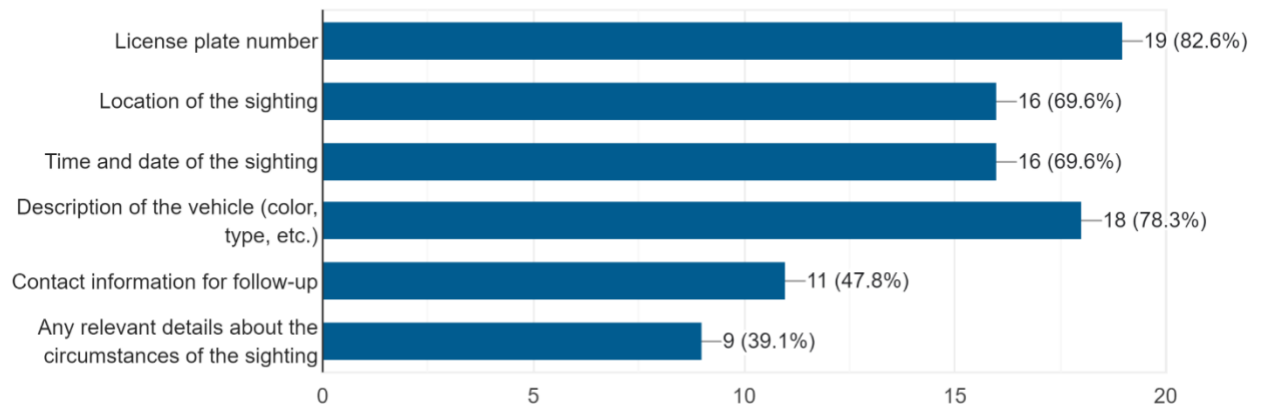


Figure 6.2.8: The Bar chart of the eighth questionnaire question.

How do you prefer to receive notifications about new stolen vehicle reports?

23 responses

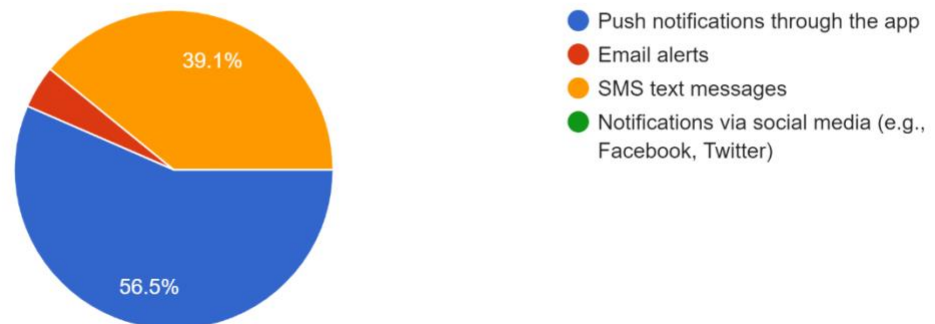


Figure 6.2.9: The pie chart of the ninth questionnaire question.

10 Appendix C: Jira

Projects / 2024-IT320-G5

Backlog

Epic ▾
Type ▾

☐ ▾ **Backlog** (12 issues)
 28 0 0
Create sprint

	SCRUM-1	As a user, I want to sign up and create an account ...	TO DO ▾	3	
	SCRUM-5	As a user, I want to log in using my username and ...	TO DO ▾	2	
	SCRUM-7	As a user, I want to be able to log out of my accou...	TO DO ▾	2	
	SCRUM-2	As a registered user, I want to add a report for a st...	TO DO ▾	3	
	SCRUM-3	As a registered user, I want to view stolen vehicle r...	TO DO ▾	2	
	SCRUM-8	As a registered user, I want to search for specific v...	TO DO ▾	2	
	SCRUM-11	As a registered user, I want to edit my existing sus...	TO DO ▾	2	
	SCRUM-10	As a registered user, I want to delete my submitte...	TO DO ▾	2	
<input type="checkbox"/>		SCRUM-9 As a registered user, whether I reported my st...	TO DO ▾	2	...
	SCRUM-6	As a registered user, I want to engage in a private ...	TO DO ▾	3	
	SCRUM-12	As a user, I want the app to load stolen vehicle re...	TO DO ▾	3	
	SCRUM-13	As a user, I want the app to be available almost all...	TO DO ▾	2	

+ Create issue

Figure 6.2.1: Product Backlog of Arsedha Application in Jira

▼

SCRUM Sprint 2

28 Oct – 18 Nov

(12 issues)

28

0

0

Start sprint

...

SCRUM-1

As a user, I want to sign up and create an account ...

TO DO ▼

3

SCRUM-5

As a user, I want to log in using my username and ...

TO DO ▼

2

SCRUM-7

As a user, I want to be able to log out of my accou...

TO DO ▼

2

SCRUM-2

As a registered user, I want to add a report for a st...

TO DO ▼

3

SCRUM-3

As a registered user, I want to view stolen vehicle r...

TO DO ▼

2

SCRUM-8

As a registered user, I want to search for specific v...

TO DO ▼

2

SCRUM-11

As a registered user, I want to edit my existing sus...

TO DO ▼

2

SCRUM-10

As a registered user, I want to delete my submitte...

TO DO ▼

2

SCRUM-9

As a registered user, whether I reported my stolen ...

TO DO ▼

2

SCRUM-6

As a registered user, I want to engage in a private ...

TO DO ▼

3

SCRUM-12

As a user, I want the app to load stolen vehicle re...

TO DO ▼

3

SCRUM-13

As a user, I want the app to be available almost all...

TO DO ▼

2

+ Create issue

Figure 6.2.2: Sprint 2 Backlog of Arsedha Application in Jira