# Software Requirements Specification

**for**

# The Karpool System

**Version 1.4 approved**

**Prepared by Section04-Group03**

**King Fahd University of Petroleum and Minerals**

**Thursday 12 May 2022**

# Table of Contents

# Revision History

| Name | Date | Reason For Changes | Version |
|---|---|---|---|
| interface | 4/15/2022 | Adding more requirements about the interface | 1.1 |
| Work Distribution | 4/16/2022 | Working distribution and it's content was not up to date | 1.2 |
| Table of content | 4/16/2022 | Adjusting the table to fit new additions | 1.3 |
| Update the file and finish the final version | 5/12/2022 | update the table of content<br>update the word distribution<br>update the meeting schedule | 1.4 |

# Work Distribution

| Name | Sections |
|---|---|
| Mostafa Othman | phase1:<br>(**Introduction**)<br>phase 2:<br>(Use cases and activity diagrams)<br>(Requirements IDs)<br>nonfunctional requirements<br>phase3:<br>Hardware interface |
| Abdulaziz Binyabis | phase1:<br>2.1-2.4 (**Overall Description**)<br>phase 2:<br>(Use cases and activity diagrams)<br>(Requirements IDs)<br>nonfunctional requirements<br>phase3:<br>User interface |
| Turki Alduhami | phase 1:<br>2.5-2.7 (**Overall Description**)<br>phase 2:<br>(Use cases and activity diagrams)<br>(Requirements IDs)<br>nonfunctional requirement<br>phase3:<br>User interface |
| Jehad Alrehaily | phase 1:<br>(**System Features**)<br>phase 2: |

| | |
|---|---|
| | (Use cases and activity diagrams)<br>(Requirements IDs)<br>nonfunctional requirement<br>phase3:<br>User interface<br>Communication interface |
| Khaled alshahrani | phase1:<br>3 (**System Features**)<br>phase 2:<br>2(Use cases and activity diagrams)<br>2(Requirements IDs)<br>1 nonfunctional requirement<br>phase3:<br>Software interface |

# Conducted Meetings

| **Subject** | **Date** | **Duration** |
|---|---|---|
| Project planning and distribution of work | 02/23/2022 | 16 minutes |
| Asking the instructor about different parts of the project | 02/24/2022 | 29 minutes |
| Project planning and distribution of work | 04/13/2022 | 17 minutes |
| Doing use cases and discussing requirements further | 04/15/2022 | 3 hours and half |
| Work in the external interface requirement | 5/12/2022 | 2 hours and 54 minutes |

# 1. Introduction

## 1.1. Purpose

*The purpose of this SRS document is to describe the requirements specifications for KarPool a platform to pool cars owned by KFUPM members to reduce the number of trips to and from neighboring schools. This document will describe the platform and illustrate its features, detailed requirements, and interfaces.*

## 1.2. Document Conventions

*In this SRS document bold font is used to indicate titles, headers, and field names. The numbering system is used to list and sub-list categories. Each requirement has a unique identification number that consist of the abbreviation "REQ-" followed by an assigned unchangeable number that does not indicate the priority of the requirement. The priority levels in this document are:*

*High meaning critical.*

*Medium meaning necessary.*

*Low meaning can wait until resources permit.*

## 1.3. Intended Audience and Reading Suggestions

*The document is intended for requirements engineers, system designers, domain expert, developers, project managers, and end users. Before reading this document, it is highly recommended for end users to only read the high-level description of the system sections 1-2, but for other stakeholders reading the sections in order will help them build a clear understanding of the system from high-level description to more technical description of the system.*

## 1.4. Project Scope

*A software system to pool cars owned by KFUPM faculty via a mobile application is the application being defined by this document. The software system provides a reliable and safe way for KFUPM residents and faculty to deliver their kids to and from the university school and neighboring schools. The software also provides a clear interface that will help you create an account and use it to choose a trip. The software provides numerous criteria to help you choose the right ride for you and a rating system to ensure the quality of the rides. The software is linked to the university ICTC department to maximize the security of the software and ease the access of faculty information. The software is a part of KFUPM vision to enhance the quality of life for KFUPM faculty and reduce traffic jams in and around the university.*

## 1.5. References

*IEEE. IEEE Std 830-1998 IEEE Recommended Practice for Software Requirements Specifications. IEEE Computer Society, 1998.*

# 2. Overall Description

## 2.1. Product Perspective

*This project is a new project, it aims to reduce the number of trips to and from schools by offering a platform that allows participants to pool cars that pick up/deliver children. Thus, parents do not have to do that if they have conflict time. Also, it is owned by KFUPM members.*

## 2.2. Product Features

*- Create account. - Edit Profile.*
*- Search Field. - Feedback.*
*- Select Option.*

## 2.3. User Classes and Characteristics

*- The University: The university is the main supporter of this project because it will provide benefits to all KFUPM members.*
*- Parents: All parents who cannot pick up/deliver them to the school.*
*- KFUPM members (who have children): All the members at KFUPM.*
*- Children: All children that are going to school.*
*- Participants: These users who have cars to deliver children to school in a specific period.*

## 2.4. Operating Environment

*- The KarPool is an application and can work perfectly in any operating system, it will be developed with Java using NetBeans as IDE. It will be for both Apple users and Android users.*
*- Version: Apple +10*
*- Version: Android +8*

## 2.5. Design and Implementation Constraints

*• Memory use shouldn't exceed 300 mb because of older mobile limitations.*
*• Must comply with ICTC rules and regulations.*
*• Languages available must include English, Arabic and Urdu.*
*• Branding of KFUPM must be included.*
*• Uses only KFUPM data base.*
*• The system development team's time must not exceed 4 months.*

## 2.6. User Documentation

*To deliver the*
*User manual : Provided through the online website of KARPOOL.*
*On-Line chat contact : Through chat on the website.*

*FAQ : Frequently asked questions are posted on the website for users to go back to and check solutions to common problems and errors.*
*Video of product : A video detailing the important features of KARPOOL.*

## 2.7. Assumptions and Dependencies

- *The user has a mobile device.*
- *The user has a stable internet connection.*
- *The user has a stable GPS signal.*
- *The schools have cell and internet service.*
- *If the user has a car, they have a non-expired license and registration.*
- *The photos to be used in the app are recent.*

# 3. System Features

## 1-Creation of accounts

*This feature makes users able to sign up or login to the system and use its feature. High.*

REQ-1.1: The Karpool system shall import the information of KFUPM faculty from the ICTC.

REQ-1.1.1: The Karpool system shall import the email information from the ICTC.

REQ-1.1.2: The Karpool system shall import the housing area information from the ICTC.

REQ-1.1.3: The Karpool system shall import the car information from the ICTC.

REQ-1.2: The Karpool system shall allow the parents to login using their accounts if they are KFUPM facility.

REQ-1.3: The parents should add their child to their account in child menu.

## 2-Profile

This feature allows the user to change their profile information. *Medium.*

REQ-2.1: the karpool system shall allow the users to change their profile pictures.

REQ-2.2: the karpool system shall allow the users to change their car capacity.

REQ-2.3: the karpool system should sync with the ICTC and take the house information from them.

REQ-2.4: the karpool system should sync with the ICTC and take the car information from them.

## 3-School information

This feature allows the parents to specify and change school information. *Medium.*

REQ-3.1: The karpool system shall allow the user to specify timing of schools.

REQ-3.2: The karpool system shall allow the user to choose the schools of his children.

REQ-3.3: The karpool system shall calculate the distance between the housing area and the school.

REQ-3.4: The karpool system shall calculate the time it takes to get to the school.

REQ-3.5: The karpool system shall calculate the time it takes to get from the school.

## 4-Searching for participant

This feature shows suggestions to the parents to choose for delivering their child. *High.*

REQ-4.1: the karpool system shall order the participant according to the housing area and car capacity.

REQ-4.2: the karpool system shall allow the user to be participant or not.

REQ-4.3: the karpool system shall show suggestion based on the rating.

## 5-Rating

This feature allows the users to rate each other and comment in each other profile. *Low.*

REQ-5.1: the karpool system shall allow users to rate each other in the profile.

REQ-5.2: the karpool system shall allow users to comment about each other.

## 6-Interfaces

This feature allows different type of users to interact with the systems. Priority high.

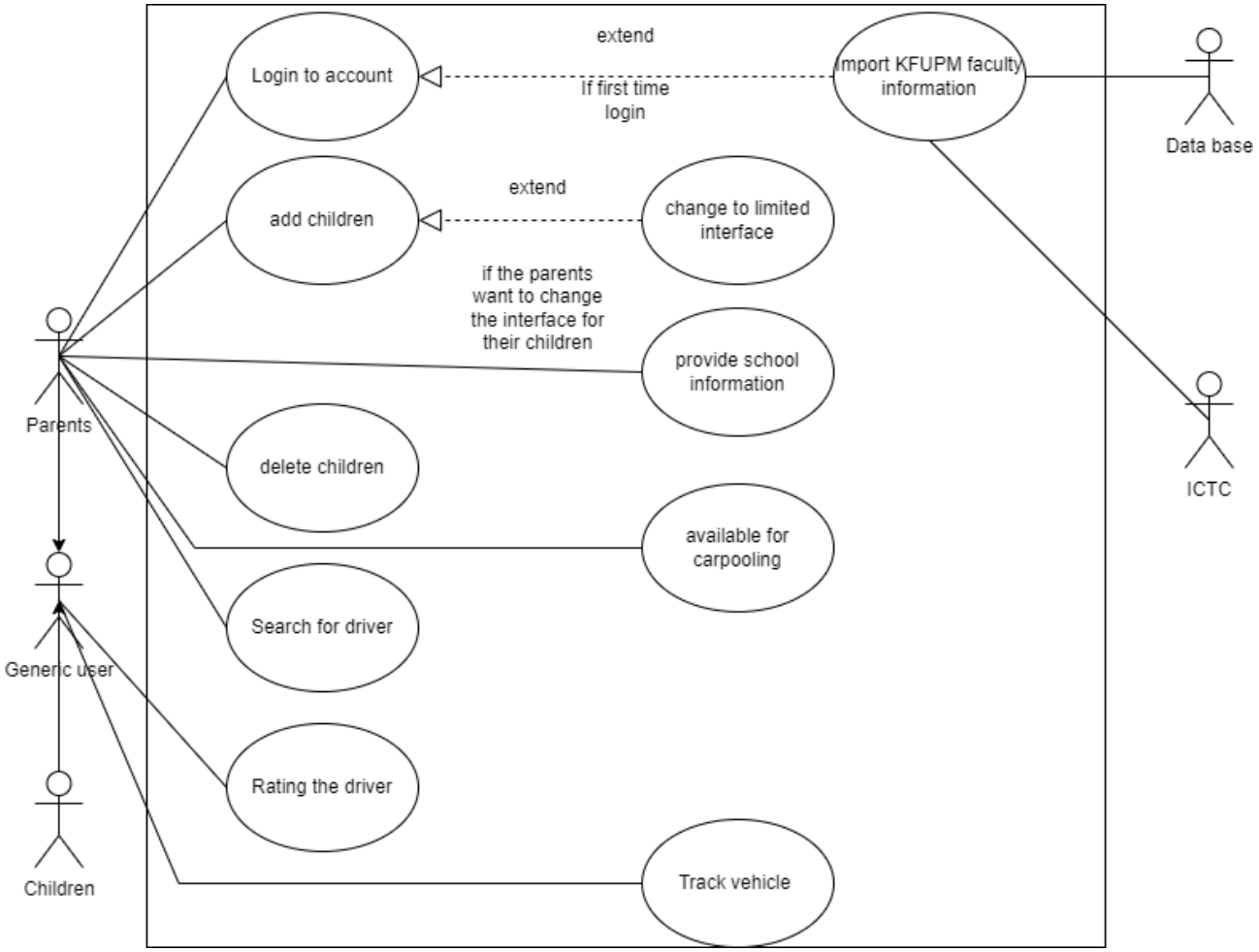
REQ-6.1: the karpool system shall provide an interface for general users.

REQ-6.2: the karpool system shall provide a limited interface for children.

REQ-6.2.1: this interface is activated via the parents account throw child menu.

# 4. Detailed Requirements

## 4.1 UML Use case Diagram



# 4.2 Functional Requirements

### 4.2.1.1 Requirement ID1: Login to account

| | |
|---|---|
| **Priority** | High |
| **Effort** | Two weeks |
| **Risk** | High |
| **Use Case(s)** | 1.1 |
| **Description** | Parents can log in to their account by using their KFUPM accounts |
| **Notes** | - |

#### 4.2.1.1 UC ID1: Login to account

| | |
|---|---|
| **Use Case ID:** | 1.1 |
| **Use Case Name:** | Login to account |
| **Created By:** | Khaled Alshahrani |
| **Date Created:** | 16/4/2022 |
| **Actors:** | 1- Parents<br>2- Data base<br>3- ICTC |
| **Description:** | Parents can log in to their account by using their KFUPM accounts |
| **Trigger:** | Open the app |
| **Preconditions:** | **1- download the application on the mobile**<br>**2- internet connection** |
| **Post conditions:** | user can use the app |
| **Normal Flow:** | 1- user open the app<br>2- login option shows up<br>3- user click on login |
| **Alternative Flows:** | 3a- the app will ask the user to enter his KFUPM account information<br>3b- the app will contact with the ICTC server to take the required information |
| **Dependencies (Includes and extends relationships)** | Import KFUPM faculty information |
| **Frequency of Use:** | Once after download the app |

### 4.2.1.2 Requirement ID2: Import KFUPM faculty information

| | |
|---|---|
| **Priority** | High |
| **Effort** | One week |
| **Risk** | High |
| **Use Case(s)** | 1.2 |
| **Description** | The application will send a request to the ICTC server to take the user information for login operation |
| **Notes** | - |

#### 4.2.1.2 UC ID2: Import KFUPM faculty information

| | |
|---|---|
| **Use Case ID:** | 1.2 |
| **Use Case Name:** | Import KFUPM faculty information |
| **Created By:** | Khaled Alshahrani |
| **Date Created:** | 16/4/2022 |
| **Actors:** | 1- Parents<br>2- Data base<br>3- ICTC |
| **Description:** | The application will send a request to the ICTC server to take the user information for login operation |
| **Trigger:** | User enter his information to login and click login button |
| **Preconditions:** | **1- download the application on the mobile**<br>**2- internet connection**<br>**3- user have a KFUPM account** |
| **Post conditions:** | User can use the app |
| **Normal Flow:** | 1- the app will contact with the ICTC server to take the required information<br>2- the information will send to the application |
| **Alternative Flows:** | 1a- if the information is not in the data base the server will send error message to the app |
| **Dependencies (Includes and extends relationships)** | Login to account |
| **Frequency of Use:** | Once after download the app |

### 4.2.1.3 Requirement ID3: Add children

| | |
|---|---|
| **Priority** | High |
| **Effort** | 2 months |
| **Risk** | Medium |
| **Use Case(s)** | 1.3 |
| **Description** | The parent adds the child to the child menu. |
| **Notes** | - |

#### 4.2.1.3 UC ID3: Add children

| | | | |
|---|---|---|---|
| **Use case ID:** | 1.3 | | |
| **Use Case Name:** | Add children | | |
| **Created by:** | Jehad Alrehaily | | |
| **Date Created:** | 4/16/2022 | | |
| **Actors:** | Parents – Primary<br>Database – secondary | | |
| **Description:** | The parent adds the child to the child menu. | | |
| **Trigger:** | Choosing the "Add child" option | | |
| **Preconditions:** | 1-Users must have an active account | | |
| **Postconditions:** | 1-The child is added to the child menu | | |
| **Normal Flow:** | 1-The user opens the application.<br>2-The user logs into their account with username and password.<br>3-The parent goes to the profile page.<br>4-The parent goes to the child menu.<br>5-The parent clicks add child.<br>5-The parent fill the child information (Name, Age, School).<br>6-The parent clicks "Add child" option.<br>7-The parent clicks "I'm sure" option to add the child information.<br>8-The child information is saved in the database. | | |
| **Alternative Flows:** | 2a- The login information is already saved (remember me feature) so no need to enter the information again.<br>7a- The parent chooses "cancel" and the child is not added from the child menu. | | |
| **Exceptions:** | In 2 if the information (username and password) is not correct:<br>1-Show an option for forgetting a password or username<br>2-Give contact information of ICTC if the password and username are correct and still not logging in | | |
| **Assumptions:** | 1. The user has internet connection. | | |
| **Notes and Issues:** | - | | |

### 4.2.1.4 Requirement ID4: Change to limited interface (child interface)

| | |
|---|---|
| **Priority** | High |
| **Effort** | 3 months |
| **Risk** | Medium |
| **Use Case(s)** | 1.4 |
| **Description** | The parent Change the app in the child phone to limited interface (child interface) |
| **Notes** | - |

#### 4.2.1.4 UC ID4: Change to limited interface (child interface)

| | | | |
|---|---|---|---|
| **Use case ID:** | 1.4 | | |
| **Use Case Name:** | Change to limited interface (child interface) | | |
| **Created by:** | Jehad Alrehaily | **Last Updated by:** | 4/16/2022 |
| **Date Created:** | 4/16/2022 | **Last Revision Date:** | 4/16/2022 |
| **Actors:** | Parents – Primary | | |
| **Description:** | The parent Change the app in the child phone to limited interface (child interface) | | |
| **Trigger:** | Choosing the "change to child screen" option | | |
| **Preconditions:** | 1-Users must have an active account.<br>2-Users must have child in the child menu. | | |
| **Postconditions:** | 1-The app in the child phone has change to limited interface (child interface). | | |
| **Normal Flow:** | 1-The user opens the application.<br>2-The user logs into their account with username and password.<br>3-The parent goes to the profile page.<br>4-The parent goes to the child menu.<br>5-The parent clicks the three dots option of the desired child.<br>6-The parent clicks "change to child screen" | | |
| **Alternative Flows:** | 2a- The login information is already saved (remember me feature) so no need to enter the information again. | | |
| **Exceptions:** | In 2 if the information (username and password) is not correct:<br>1-Show an option for forgetting a password or username<br>2-Give contact information of ICTC if the password and username are correct and still not logging in | | |

| | |
|---|---|
| **Assumptions:** | 1. The user has internet connection. |
| **Notes and Issues:** | - |

### 4.2.1.5 Requirement ID5: Provide school information

| | |
|---|---|
| **Priority** | Medium |
| **Effort** | 2 weeks |
| **Risk** | Low |
| **Use Case(s)** | 1.5 |
| **Description** | The parent provides the information of the school/schools that his kids go to for the system to use when appropriate i.e., when carpooling or searching for a driver. |
| **Notes** | Getting the information of schools in the city to use it to verify the user's input may be the highest effort task for this use case. |

#### 4.2.1.5 UC ID5: Provide school information

| | | | |
|---|---|---|---|
| **Use case ID:** | 1.5 | | |
| **Use Case Name:** | Provide school information | | |
| **Created by:** | Mostafa Othman | **Last Updated by:** | 4/16/2022 |
| **Date Created:** | 4/15/2022 | **Last Revision Date:** | 4/16/2022 |
| **Actors:** | Parents - Primary | | |
| **Description:** | The parent provides the information of the school/schools that his kids go to for the system to use when appropriate i.e., when carpooling or searching for a driver. | | |
| **Trigger:** | Clicking "Add school information" in the profile | | |
| **Preconditions:** | 1. User must have an active account | | |
| **Postconditions:** | The school is verified by the system.<br>The school information is saved to the profile. | | |
| **Normal Flow:** | 1-The user opens the application.<br>2-The user logs into their account with username and password.<br>3-The parent goes to the profile page.<br>4-The parent clicks the "Add school information" option.<br>5-The parent provides the school's name in the appropriate space.<br>6-The parent clicks "save" to save the information to their profile. | | |

| | |
|---|---|
| **Alternative Flows:** | 2a- The log in information is already saved (remember me feature) so no need to enter the information again.<br>6a- The school information does not match any of the schools in the city so it can not be saved, change the information then try again. |
| **Exceptions:** | 2a- the information (username and password) is not correct:<br>1-Show an option for forgetting a password or username<br>2-Give contact information of ICTC if the password and username are correct and still not logging in. |
| **Assumptions:** | 1. The user has internet connection.<br>2. The parent knows their kids school information. |
| **Notes and Issues:** | - |

### 4.2.1.6 Requirement ID6: Delete children

| | |
|---|---|
| **Priority** | High |
| **Effort** | 2 months |
| **Risk** | Medium |
| **Use Case(s)** | 1.6 |
| **Description** | The parent deletes the child information from the child menu. |
| **Notes** | - |

#### 4.2.1.6 UC ID6: Delete children

| | | | |
|---|---|---|---|
| **Use case ID:** | 1.6 | | |
| **Use Case Name:** | Delete children | | |
| **Created by:** | Mostafa Othman | **Last Updated by:** | 4/16/2022 |
| **Date Created:** | 4/15/2022 | **Last Revision Date:** | 4/16/2022 |
| **Actors:** | Parents - Primary | | |
| **Description:** | The parent deletes the child information from the child menu. | | |
| **Trigger:** | Choosing the “Delete child” option | | |
| **Preconditions:** | 1-Users must have an active account | | |
| **Postconditions:** | 1-The child is deleted from the child menu | | |

| | |
|---|---|
| **Normal Flow:** | 1-The user opens the application.<br>2-The user logs into their account with username and password.<br>3-The parent goes to the profile page.<br>4-The parent goes to the child menu.<br>5-The parent clicks the three dots option of the desired child.<br>6-The parent clicks “Delete child” option.<br>7-The parent clicks “I’m sure” option to delete the child information. |
| **Alternative Flows:** | 2a- The log in information is already saved (remember me feature) so no need to enter the information again.<br>7a- The parent chooses “cancel” and the child is not deleted from the child menu. |
| **Exceptions:** | 2a- the information (username and password) is not correct:<br>1-Show an option for forgetting a password or username.<br>2-Give contact information of ICTC if the password and username are correct and still not logging in. |
| **Assumptions:** | 1. The user has internet connection.<br>2. The parent already has children in the child menu. |
| **Notes and Issues:** | - |

### 4.2.1.7 Requirement ID7: Available for carpooling

| | |
|---|---|
| **Priority** | High |
| **Effort** | 2 months or 1 month and a half |
| **Risk** | High |
| **Use Case(s)** | 1.7 |
| **Description** | The parent status becomes available for carpooling, so he can take requests of carpooling other children with his own or while he is going to work or coming back from the school. |
| **Notes** | Time of development may vary because of difficulty of connecting information directly between users |

#### 4.2.1.7 UC ID7: Available for carpooling

| | | | |
|---|---|---|---|
| **Use case ID:** | 1.7 | | |
| **Use Case Name:** | Available for carpooling | | |
| **Created by:** | Turki Alduhami | **Last Updated by:** | 4/16/2022 |

| | | | |
|---|---|---|---|
| **Date Created:** | 4/16/2022 | **Last Revision Date:** | 4/16/2022 |
| **Actors:** | Primary actor: Parent or someone in their place | | |
| **Description:** | The parent status becomes available for carpooling, so he can take requests of carpooling other children with his own or while he is going to work or coming back from the school. | | |
| **Trigger:** | Clicking the “Available for carpooling” button | | |
| **Preconditions:** | 1. User must have an active account, or he should create one<br>2. Car information of user must be up to date<br>3. User must have a driver’s license<br>4-User and driver must have a stable internet connection<br>5- User and driver must have a stable GPS signal | | |
| **Postconditions:** | 1-The children reach school/home safely<br>2-The children reach school/home on time<br>3-Gets rated for trip done | | |
| **Normal Flow:** | 1-The user opens the application<br>2-The user logs into their account with username and password<br>3-The application gets the GPS location of user<br>4-The user clicks the “Available for carpooling” Button<br>5-Recives requests from other users(parents or teachers) to pick up kids on their way/ back from school<br>6-The information about the user is sent to the parents wanting to have their kids picked up and to the kids’ account<br>7- The user gets conformation to pick up kids and their information is provided<br>8-The availability status of user is changed back to not available for carpooling<br>9-The children go with the user to the destination<br>10-The user gets rated after the trip | | |
| **Alternative Flows:** | 2a- The log in information is already saved(remember me feature) so no need to enter the information again.<br>2b-The user doesn’t have account and needs to register<br><br>6a-The parents might not accept the user to pick up their kids and so the status of carpooling availability doesn’t change | | |

| | |
|---|---|
| **Exceptions:** | In 2 if the information(username and password) is not correct:<br>1-Show an option for forgetting a password or username<br>2-Give contact information of ICTC if the password and username are correct and still not logging in |
| **Assumptions:** | The adult picking the kids up should be able to communicate with the kids in a language they understand.<br>The child knows someone is coming to pick them up. |
| **Notes and Issues:** | The user might not be able to communicate and handle the kids well because they are not used to them. |

### 4.2.1.8 Requirement ID8: Search for driver

| | |
|---|---|
| **Priority** | High |
| **Effort** | 3 months |
| **Risk** | Medium |
| **Use Case(s)** | 1.8 |
| **Description** | **The user selects a location on the map and the system provides the nearest drivers then the selected driver accepts user requests.** |
| **Notes** | **This use case takes time to develop because it has many functions.** |

#### 4.2.1.8 UC ID8: Search for driver

| | | | |
|---|---|---|---|
| **Use case ID:** | 1.8 | | |
| **Use Case Name:** | Search for driver | | |
| **Created by:** | Abdulaziz Binyabis | | |
| **Date Created:** | 4/16/2022 | | |
| **Actors:** | Parents - primary | | |
| **Description:** | The parents who want their children go to school they can search for another parent(driver) who can deliver them. | | |

| | |
|---|---|
| **Trigger:** | Click confirm the selected location button |
| **Preconditions:** | **1- User has an active account** |
| **Postconditions:** | **1- User has wi-fi**<br>**2- User has his location on the settings menu** |
| **Normal Flow:** | **1. The user opens the application**<br>**2. The login with his username and password**<br>**3. The user goes to ‘’where to go’’**<br>**4. The user set his location**<br>**5. The system finds the nearest divers**<br>**6. The user requested one of them**<br>**7. The driver accepts the request**<br>**8. The system provides in the user interface a notification message** |
| **Alternative Flows** | 2a. In step 2 of the normal flow, if the user already has a ‘’remember me’’ button on.<br>**1. The system will automatically log in**<br>**2. Use case resumes on step 3 of the normal flow**<br>5a. In step 5 of the normal flow, if the system did not find any drivers.<br>**1. The system provides the ‘’Search again’’ button**<br>**2. Use case resumes on step 6 of the normal flow** |
| **Exceptions:** | 4a. In step 4 of the normal flow, if the user sets the wrong location.<br>**1. The system provides a timer of 2 minutes to cancel trip**<br>**2. The user clicks on the cancel button**<br>**3. Use case resumes on step 8 of the normal flow** |
| **Assumptions:** | **1- This use case assumes the user knows where the location is**<br>**2- This use case assumes the user knows where to find his driver** |
| **Notes and Issues:** | **1- How many drivers can the system find?** |

### 4.2.1.9 Requirement ID9: Rating the driver

| | |
|---|---|
| **Priority** | High |
| **Effort** | 1 month or less |
| **Risk** | Medium |
| **Use Case(s)** | 1.9 |
| **Description** | **The user can rate other drivers after every trip and the rating will be saved in the database.** |
| **Notes** | **—------** |

#### 4.2.1.9 UC ID9: Rating the driver

| | | | |
|---|---|---|---|
| **Use case ID:** | 1.9 | | |
| **Use Case Name:** | Rating the driver | | |
| **Created by:** | Abdulaziz Binyabis | **Last Updated by:** | Abdulaziz Binyabis |
| **Date Created:** | 4/16/2022 | **Last Revision Date:** | 4/16/2022 |
| **Actors:** | Generic user | | |
| **Description:** | This use case describes how a user can rate the drives. | | |
| **Trigger:** | The user clicks on the ‘’done’’ button | | |
| **Preconditions:** | **1- The user has an active account** | | |
| **Postconditions:** | **1- The driver receives a notification message about the rating**<br>**2- The rating is saved in the database** | | |
| **Normal Flow:** | **1. The user arrives at the location he wants**<br>**2. The system provides a rating menu to the user interface**<br>**3. The user rates the driver**<br>**4. The user clicks the ‘’done’’ button**<br>**5. The driver receives the rating of the user** | | |

| | |
|---|---|
| | **6. The rating is saved in the database**<br>**7. The system provides the trip summary in the user interface** |
| **Alternative Flows:** | 3a. In step 3 of the normal flow, if the user did not rate the driver<br>**1. The user clicks on the ''ignore'' button**<br>**2. Use case resumes on step 7** |
| **Exceptions:** | 4a. In step 4 of the normal flow, if the user did not click on the ''done'' button<br>**1. The rating will be saved in the history of the user account**<br>**2. Use case resumes on step 7** |
| **Assumptions:** | **1- This use case assumes the user has his phone connected to the wi-fi** |
| **Notes and Issues:** | **—** |

### 4.2.1.10 Requirement ID10: Track vehicle

| | |
|---|---|
| **Priority** | Medium |
| **Effort** | 2 months |
| **Risk** | Medium |
| **Use Case(s)** | 1.10 |
| **Description** | The parent or child can track the vehicle going to the school or coming back from the school to the house and it provides more specific detail about the car and what is going on at any given time during the trip. |
| **Notes** | |

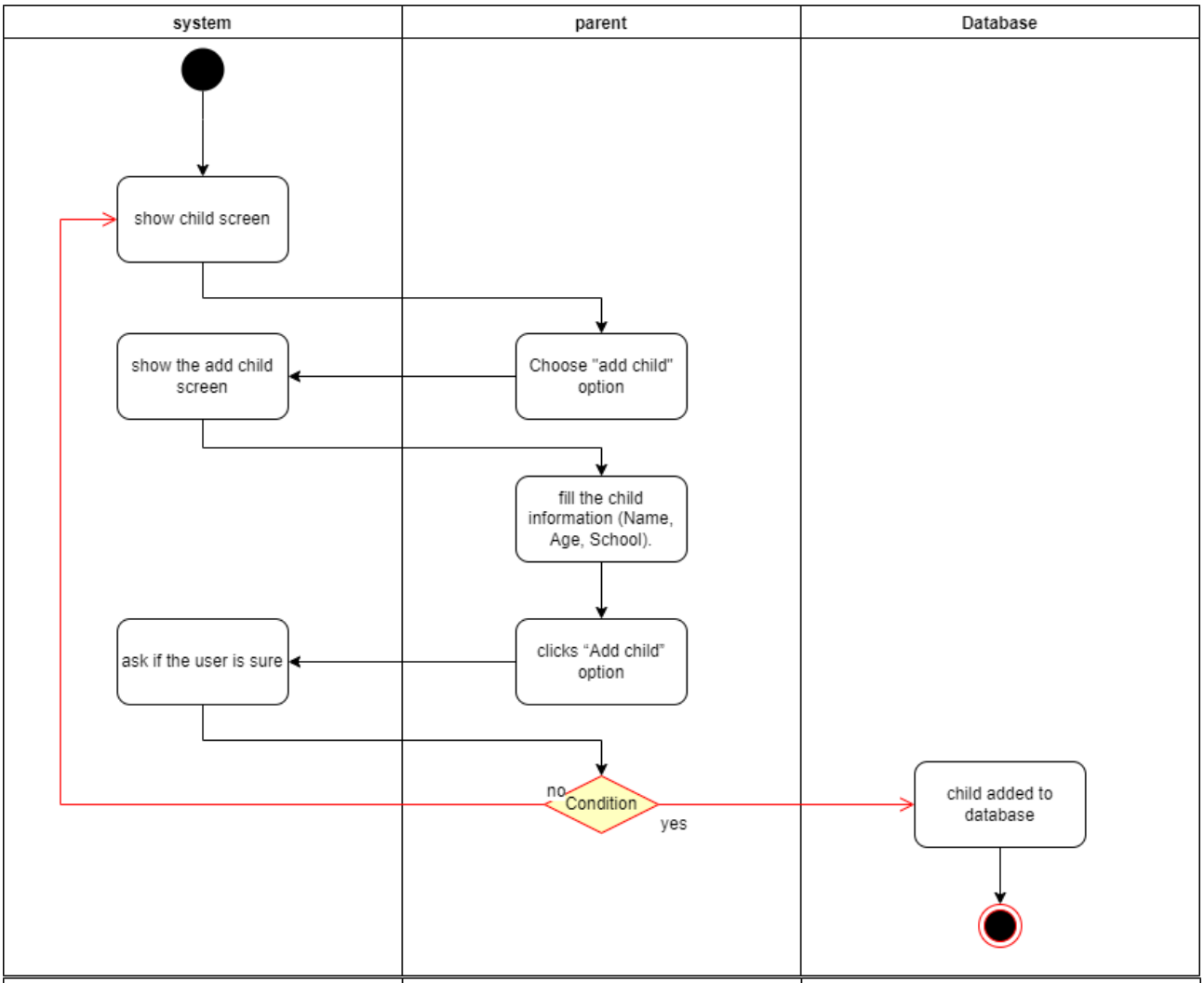
#### 4.2.1.10 UC ID10: Track vehicle

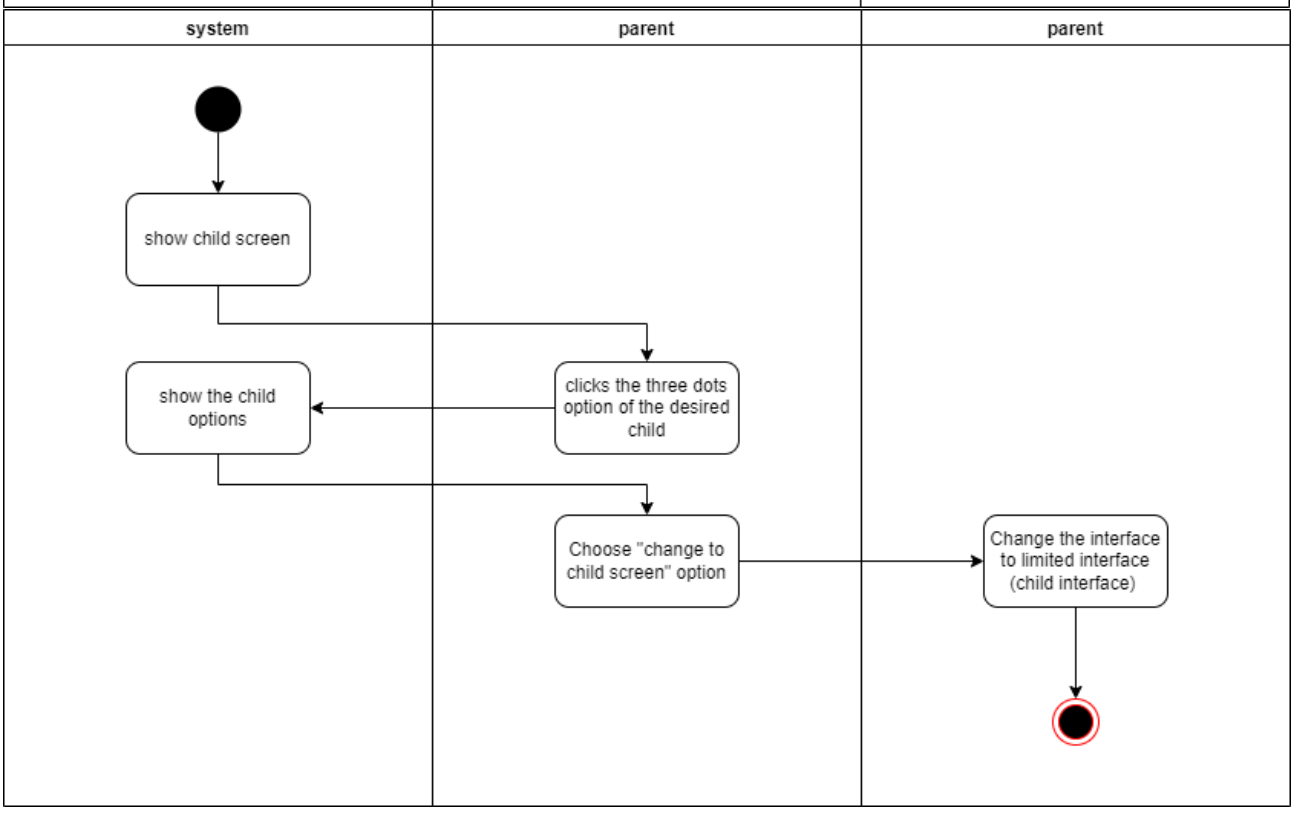
| | | | |
|---|---|---|---|
| **Use case ID:** | 1.10 | | |
| **Use Case Name:** | Track vehicle | | |
| **Created by:** | Turki Alduhami | **Last Updated by:** | 4/16/2022 |
| **Date Created:** | 4/16/2022 | **Last Revision Date:** | 4/16/2022 |
| **Actors:** | Primary actor: Parent or someone in their place<br>Secondary actor: Child | | |

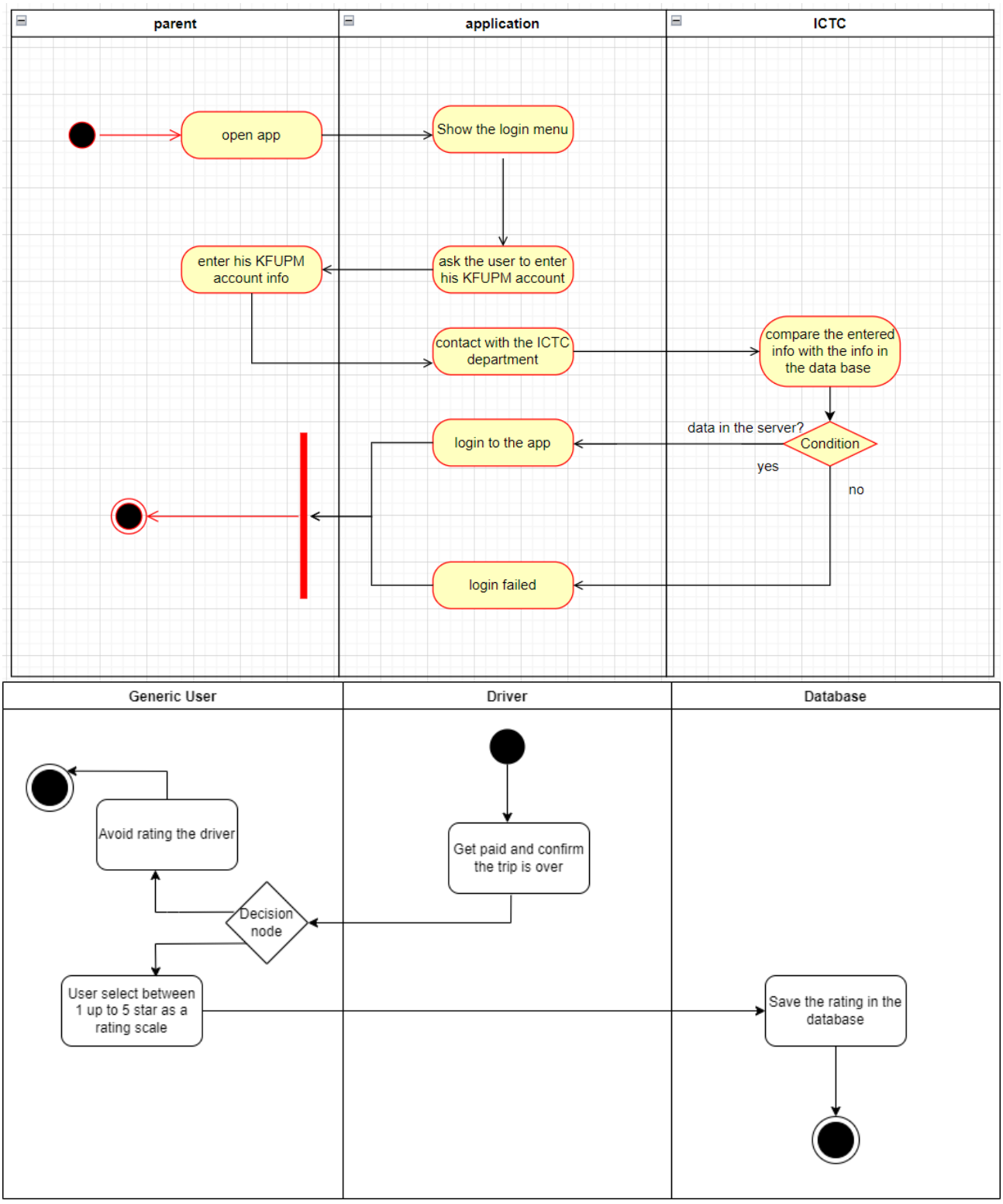
| | |
|---|---|
| **Description:** | The parent or child can track the vehicle going to the school or coming back from the school to the house and it provides more specific detail about the car and what is going on at any given time during the trip. |
| **Trigger:** | Choosing ”Track vehicle” option |
| **Preconditions:** | 1-Users must have an active account, or he should create one<br>2-Car information of driver must be up to date<br>3-driver must have a valid driver’s license<br>4-User and driver must have a stable internet connection<br>5- User and driver must have a stable GPS signal |
| **Postconditions:** | 1-The children reach school/home safely<br>2-The children reach school/home on time<br>3- Driver gets rated for trip done |
| **Normal Flow:** | 1-The user opens the application<br>2-The user logs into their account with username and password<br>3-The application gets the GPS location of user<br>4-The user chooses the ”Track vehicle” option<br>5-The map opens with both destinations from and where the trips begins and ends<br>6-The map shows the car with complete information about it and the driver with information about him and his contact number<br>7-The map also shows the estimated time of arrival<br>8-After kids reach safely user can rate the driver based on the time and the trip |
| **Alternative Flows:** | 2a- The log in information is already saved(remember me feature) so no need to enter the information again.<br>2b-The user doesn’t have account and needs to register<br><br>5a- The trip has not begun, and user is checking if car has arrived or not yet |
| **Exceptions:** | In 2 if the information(username and password) is not correct:<br>1-Show an option for forgetting a password or username<br>2-Give contact information of ICTC if the password and username are correct and still not logging in<br><br>In 5 if internet or GPS signal of either user or driver is disconnected the map won’t show the information |
| **Assumptions:** | The user already has an account.<br>The adult picking the kids up should be able to communicate with the kids in a language they understand. |

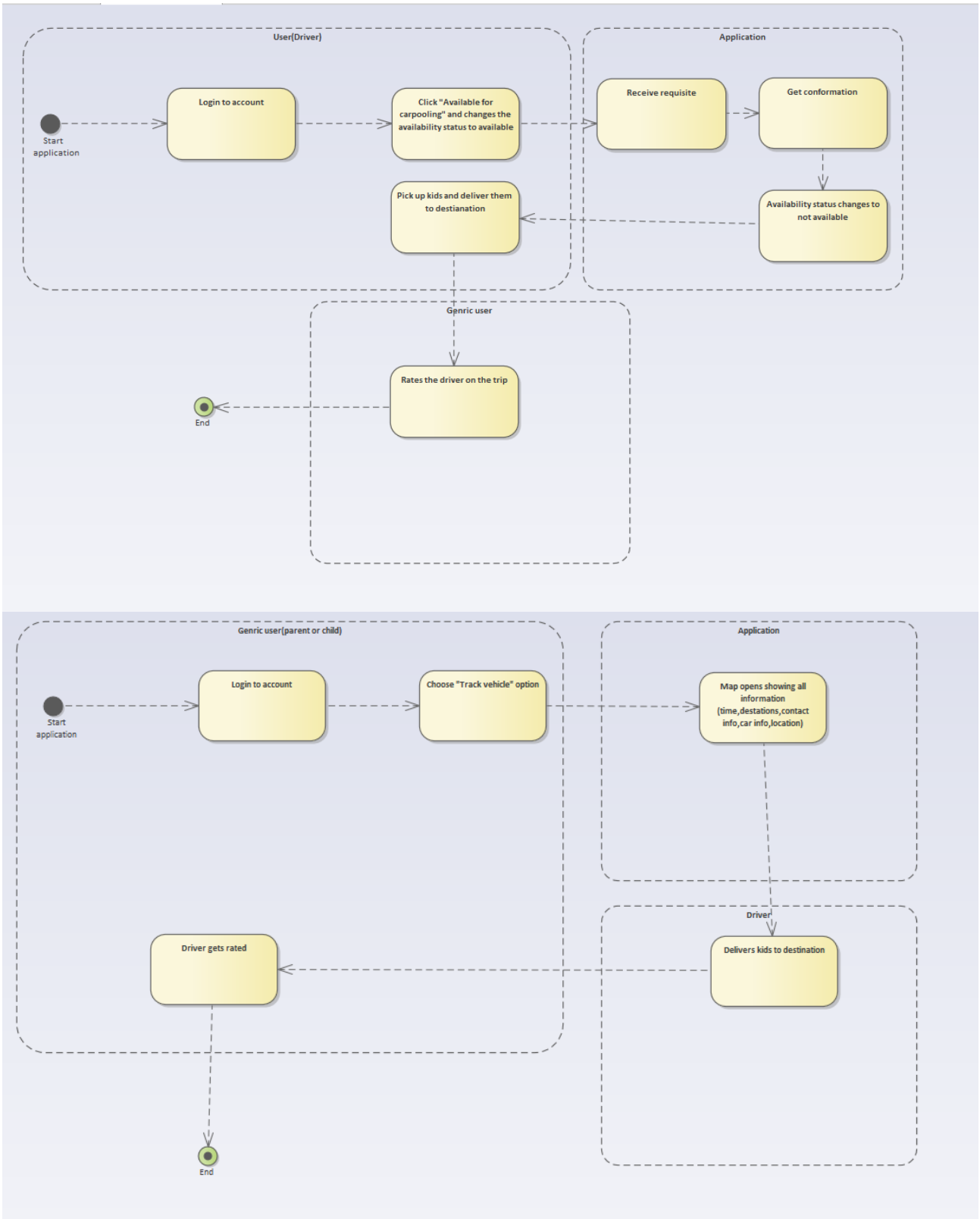
| | |
|---|---|
| | The child knows someone is coming to pick them up. |
| **Notes and Issues:** | The user might not be able to communicate and handle the kids well because they are not used to them. |

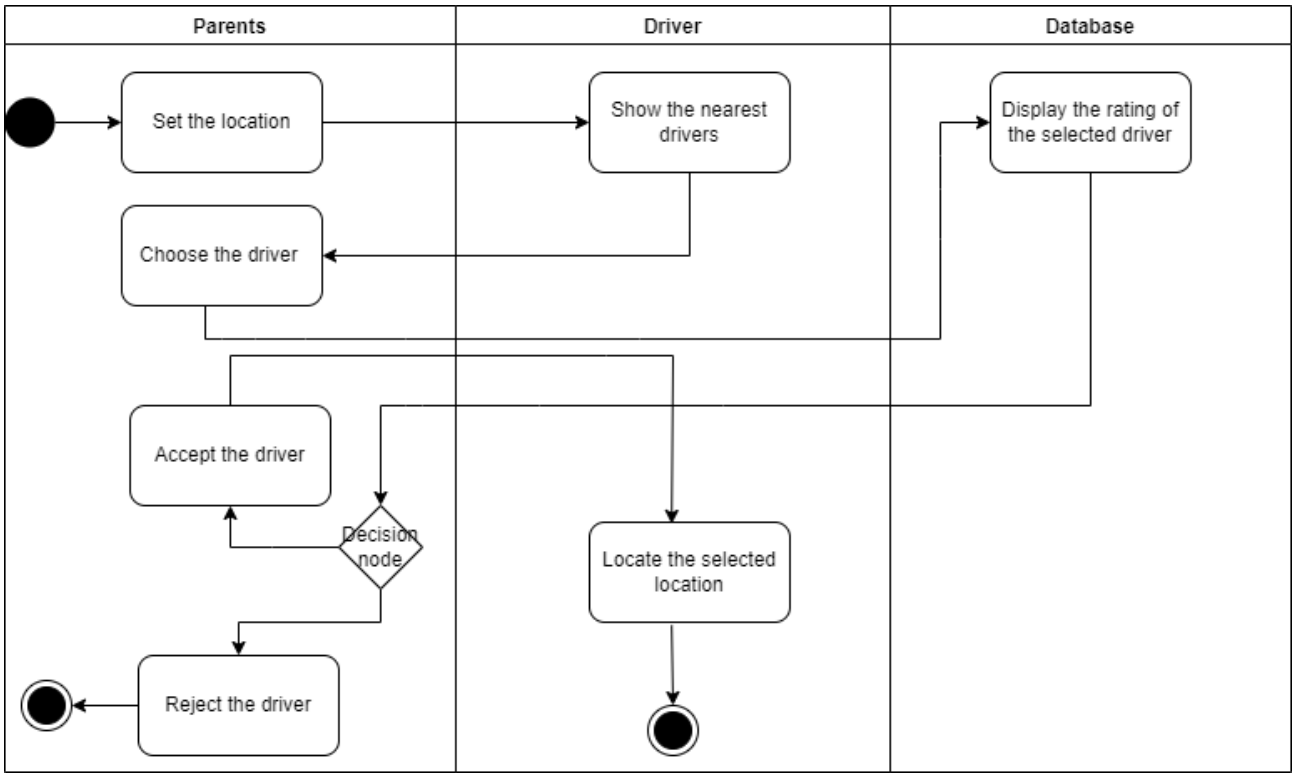
## 4.3 UML Activity Diagrams

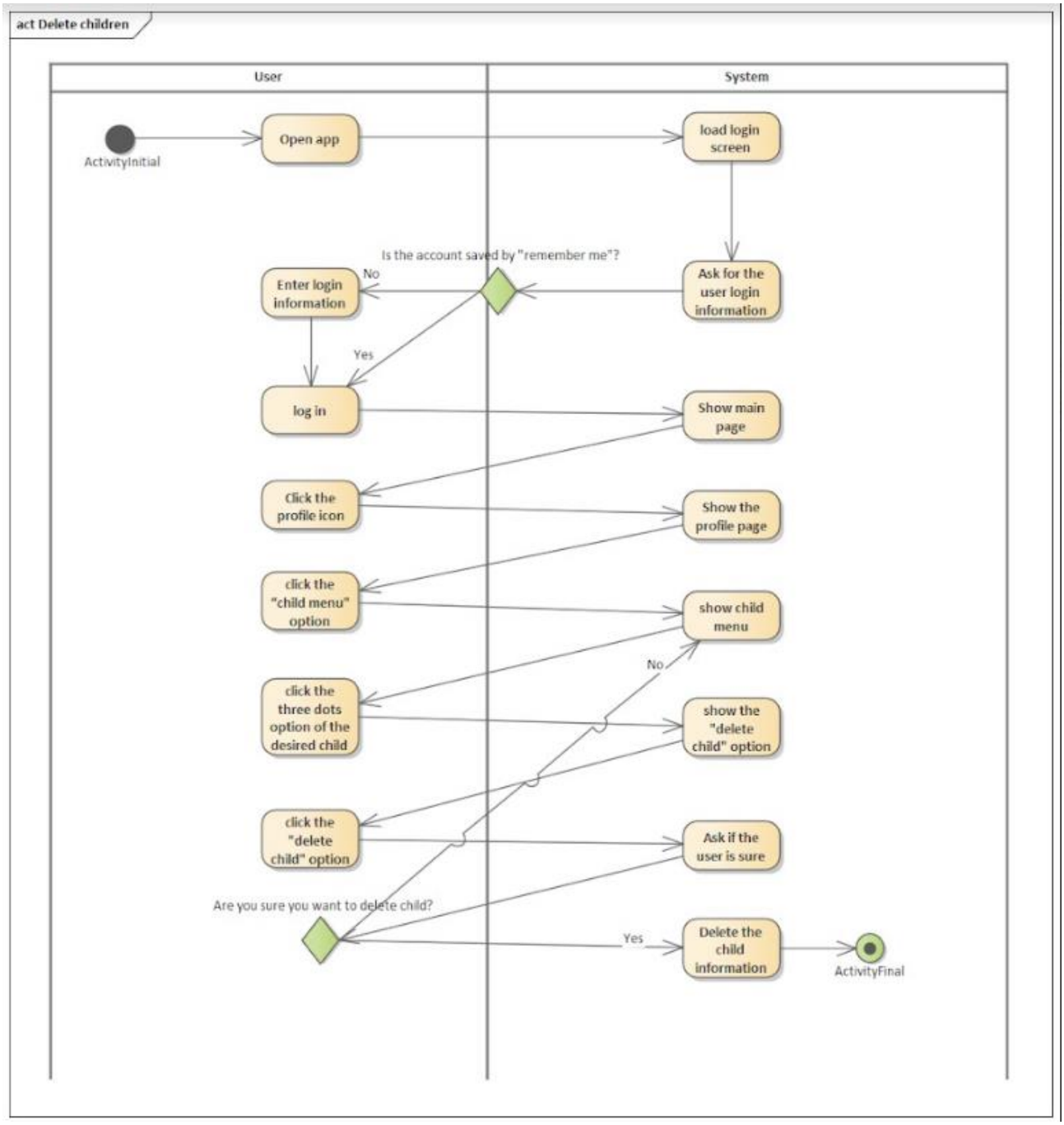

system
parent
Database
show child screen
show the add child screen
Choose "add child" option
fill the child information (Name, Age, School).
ask if the user is sure
clicks "Add child" option
no
Condition
yes
child added to database

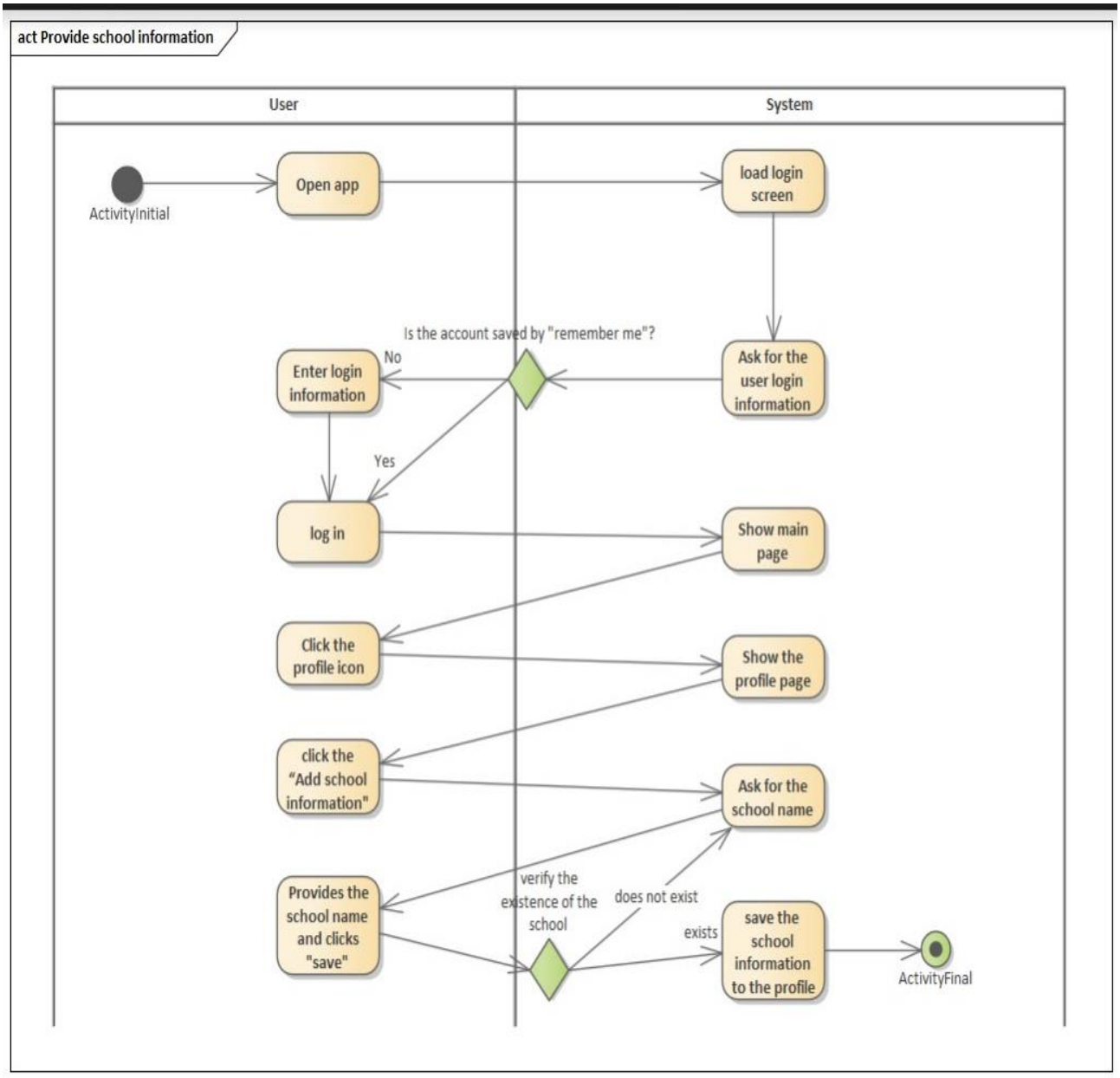

system
parent
parent
show child screen
show the child options
clicks the three dots option of the desired child
Choose "change to child screen" option
Change the interface to limited interface (child interface)


parent
application
ICTC
open app
Show the login menu
enter his KFUPM account info
ask the user to enter his KFUPM account
contact with the ICTC department
compare the entered info with the info in the data base
data in the server?
Condition
yes
no
login to the app
login failed
Generic User
Driver
Database
Avoid rating the driver
Get paid and confirm the trip is over
Decision node
User select between 1 up to 5 star as a rating scale
Save the rating in the database

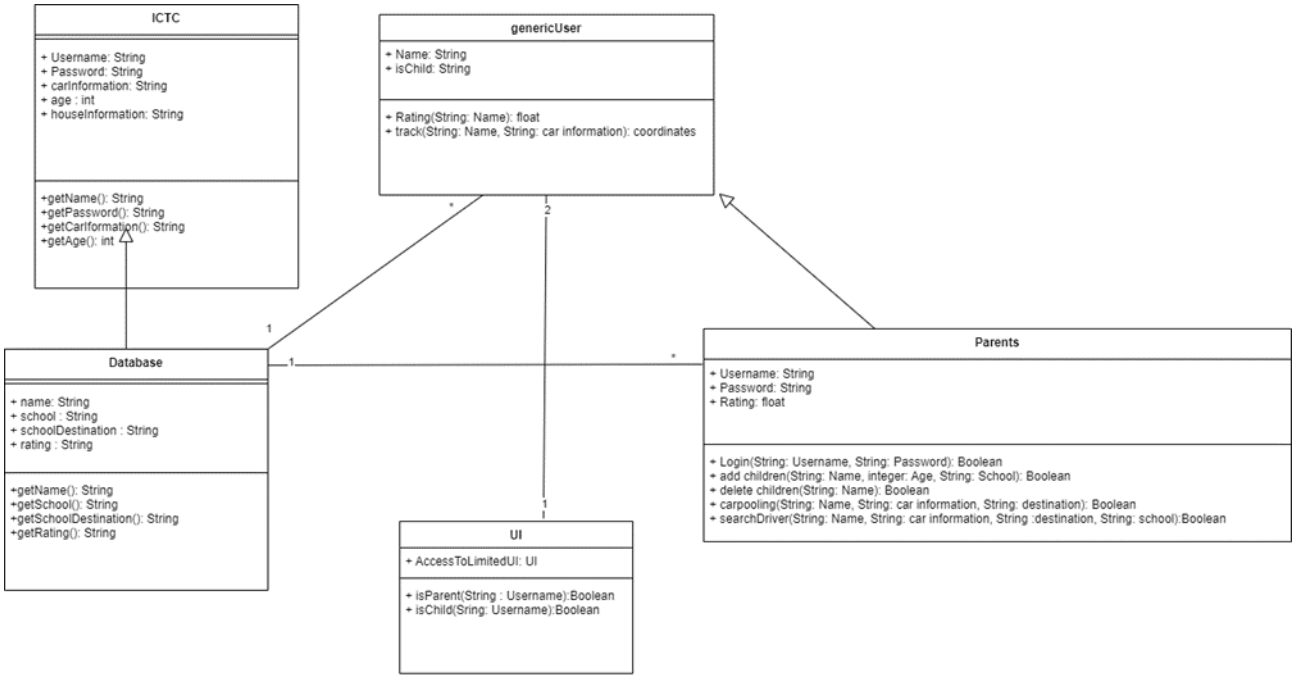

User(Driver)
Application
Start application
Login to account
Click "Available for carpooling" and changes the availability status to available
Receive requisite
Get conformation
Availability status changes to not available
Pick up kids and deliver them to destianation
Genric user
Rates the driver on the trip
End
Genric user(parent or child)
Application
Start application
Login to account
Choose "Track vehicle" option
Map opens showing all information (time,destations,contact info,car info,location)
Driver
Delivers kids to destination
Driver gets rated
End


Parents
Driver
Database
Set the location
Show the nearest drivers
Display the rating of the selected driver
Choose the driver
Accept the driver
Decision node
Locate the selected location
Reject the driver


act Delete children
User
System
ActivityInitial
Open app
load login screen
Is the account saved by "remember me"?
No
Enter login information
Ask for the user login information
Yes
log in
Show main page
Click the profile icon
Show the profile page
click the "child menu" option
show child menu
No
click the three dots option of the desired child
show the "delete child" option
click the "delete child" option
Ask if the user is sure
Are you sure you want to delete child?
Yes
Delete the child information
ActivityFinal


act Provide school information
User
System
ActivityInitial
Open app
load login screen
Is the account saved by "remember me"?
No
Enter login information
Ask for the user login information
Yes
log in
Show main page
Click the profile icon
Show the profile page
click the "Add school information"
Ask for the school name
Provides the school name and clicks "save"
verify the existence of the school
does not exist
exists
save the school information to the profile
ActivityFinal

# 4.4 System Domain Model




# 4.5 Non-functional Requirements

*<Describe only relevant NFRs>*

## i.4.5.1 Performance Requirements

NREQ-1.1.1: The system has a maximum of 5 seconds as response time for up to 1000 simultaneous users to ensure a convenient experience for users.

NREQ-1.1.2: the system shouldn't take more than 500 megabytes from the phone capacity

## ii.4.5.2 Security Requirements

NREQ-1.2.1: The system shall remind the user every month to change the password.

NREQ-1.2.2: The user passwords stored in the system must be protected against password theft.

NREQ-1.2.3: When the user changes his password, the system shall validate the new password is at least eight characters long and contain at least three character categories.

NREQ-1.2.4: ICTC shall create a new authorization code every three days for housing area information.

### iii.4.5.3 Safety Requirements

A possible harm that might come is someone trying to kidnap a child or hurt them. However, the identity of the culprit is already known, and his information is already in ICTC data base as well as his car's and his location, the police will be notified immediately if the parents are concerned in any way.

NREQ-1.3.1: The system must prevent any harm that might happen to the children or any fear of it happening using the location and culprit's and his car's information to identify him and notify the police immediately about the situation

NREQ-1.3.2: the system will calculate the time required for the trip and if the time passed by more than 5 minutes and the child didn't reach to the destination the app will send a notification to the parents.

### iv.4.5.4 Other Software Quality Attributes

NREQ-1.4.1: The application shall be available for both IOS and Android operating systems.

NREQ-1.4.2: Users shall be able to use the system without failing more than once with less than 2 hours training on the system.

NREQ-1.4.3: Components of the system may be tested separately before integrating them.

NREQ-1.4.4: The developers may be liable for all unmet or poorly met requirements mentioned in this document.

NREQ-1.4.5: In case of failure the system shall be restorable in less than 24 hours.

### v.4.5.5 Other Requirements

NREQ-1.5.1: The data base may use Microsoft SQL Server database 4-core Intel Xeon Processor500 GB or higher.

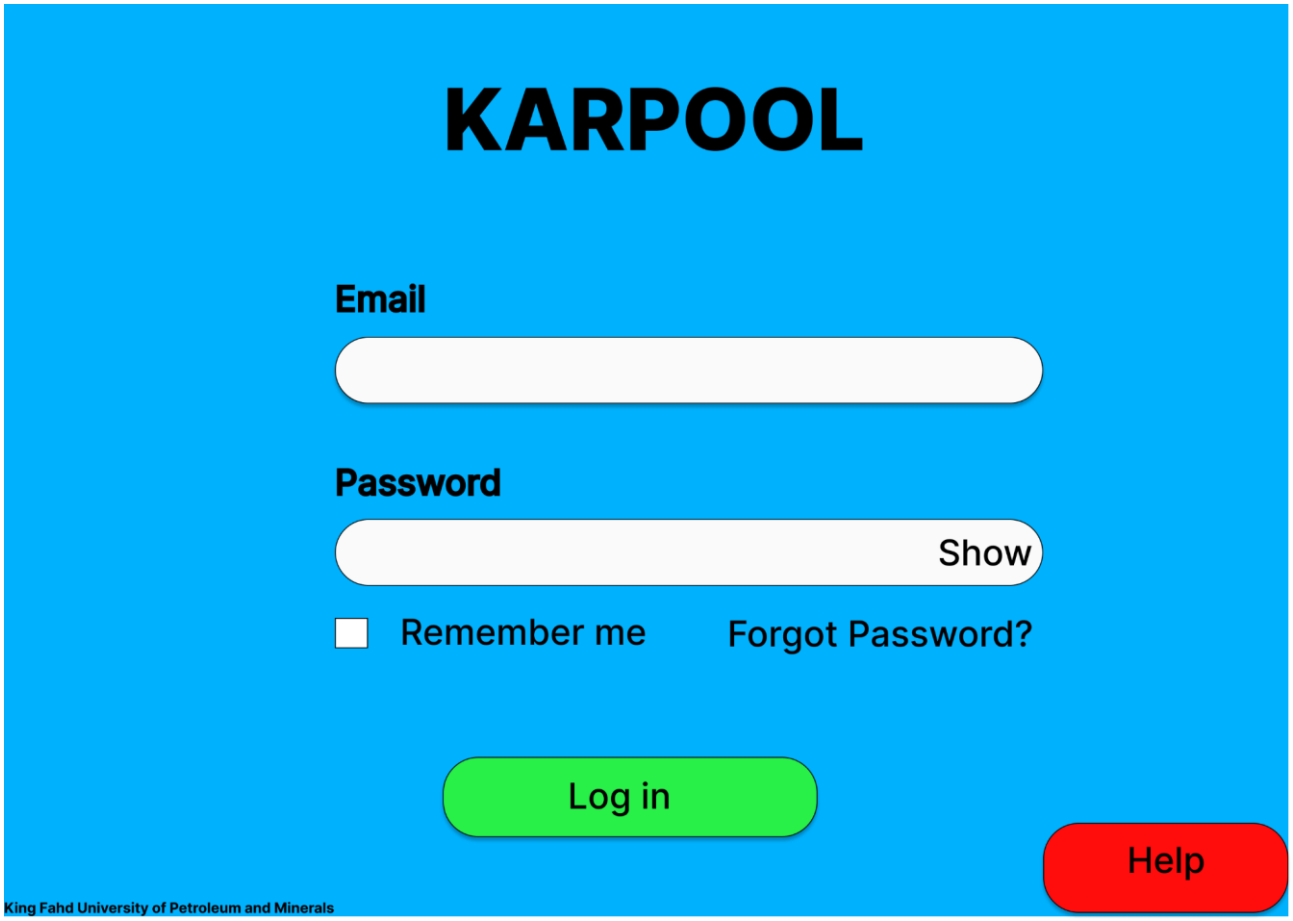
NREQ-1.5.2:The system shall adhere to Saudi Arbia's policies of privacy and legal matters, as well as KFUPM guidelines.

# 5. External Interface Requirements

## a. 5.1 User Interfaces

<Describe the logical characteristics of each interface between the software product and the users. This may include sample screen images, any GUI standards or product family style guides that are to be followed, screen layout constraints, standard buttons and functions (e.g., help) that will appear on every screen, keyboard shortcuts, error message display standards, and so on. Define the software components for which a user interface is needed. Details of the user interface design should be documented in a separate user interface specification.>

## First interface:




Buttons:

Log in: User enter his e-mail and password, an appropriate error message appears if the e-mail or the password is wrong.

Help: Incase the user forgets the Emai or password they can contact the ICTC or contact us.

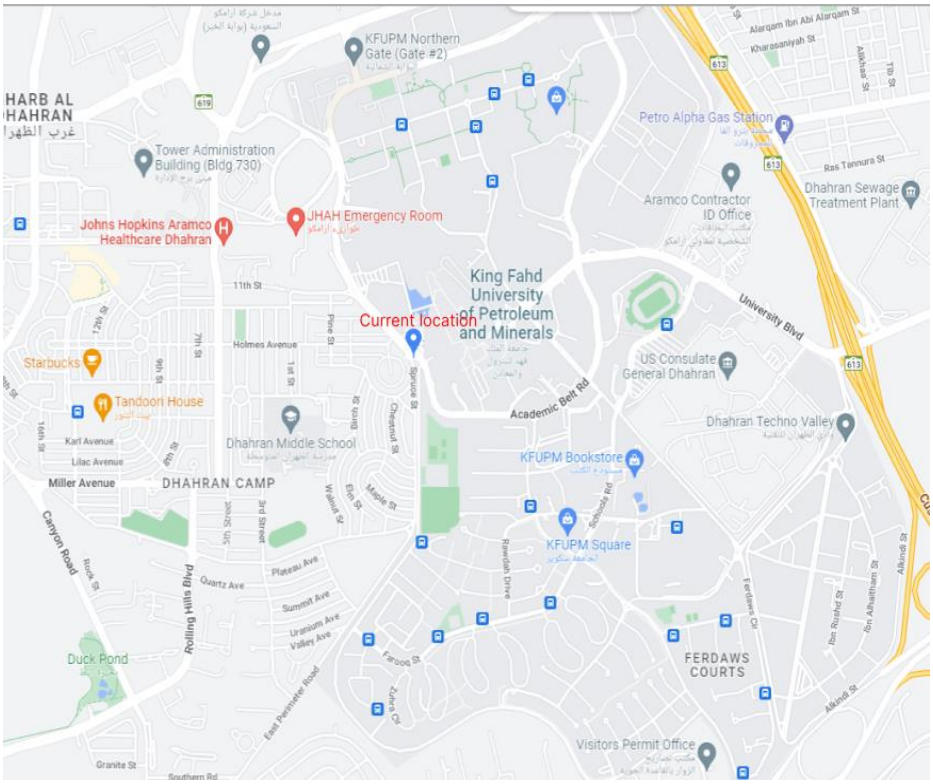
## Choose the way to set the location:


Buttons:

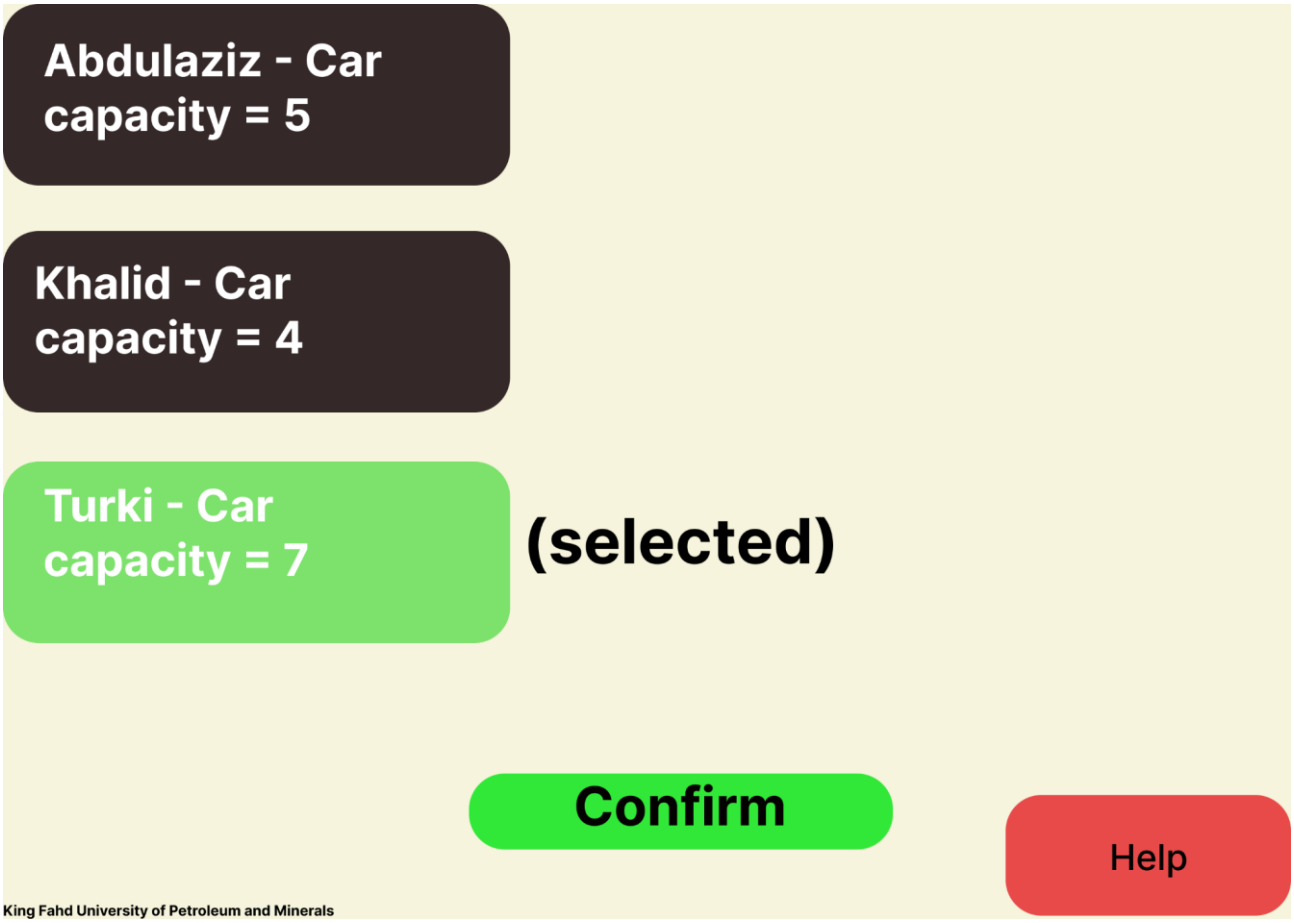
Set location from the map:

will lead to a map of the user location for them to confirm.

# Choosing the map:



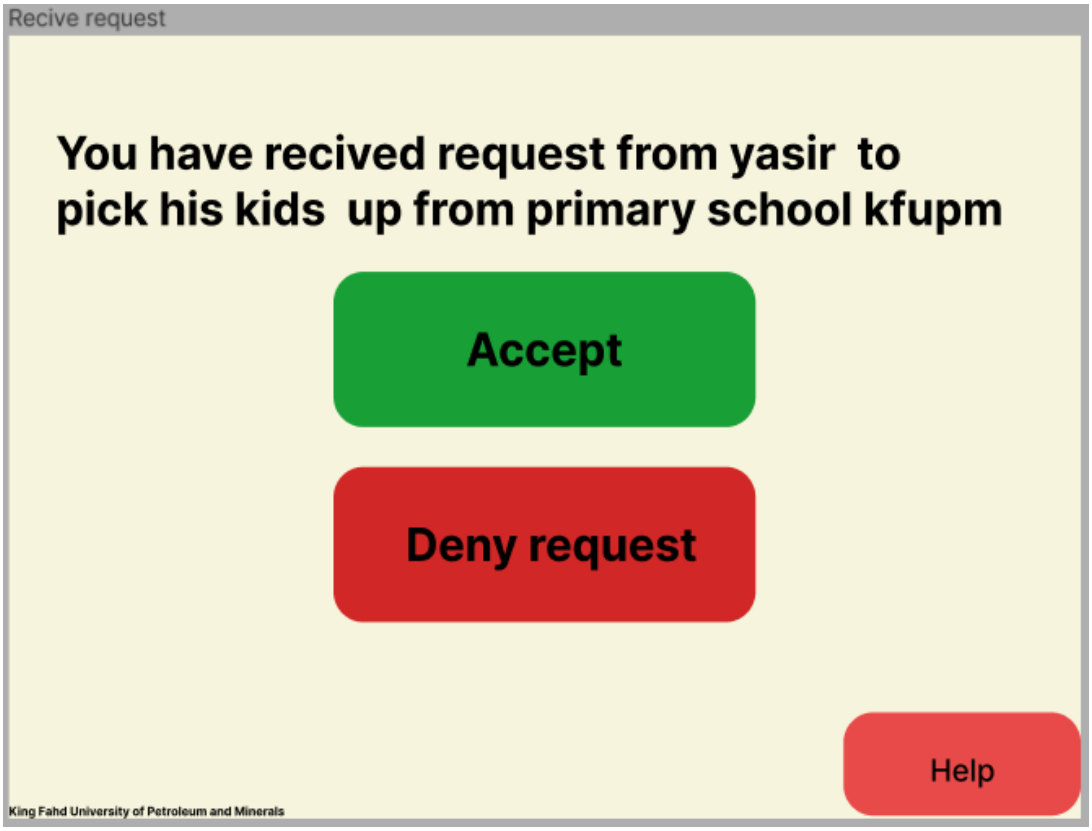
## For the parent:




Buttons:

Confirm: to confirm the user choice.

## For the driver:

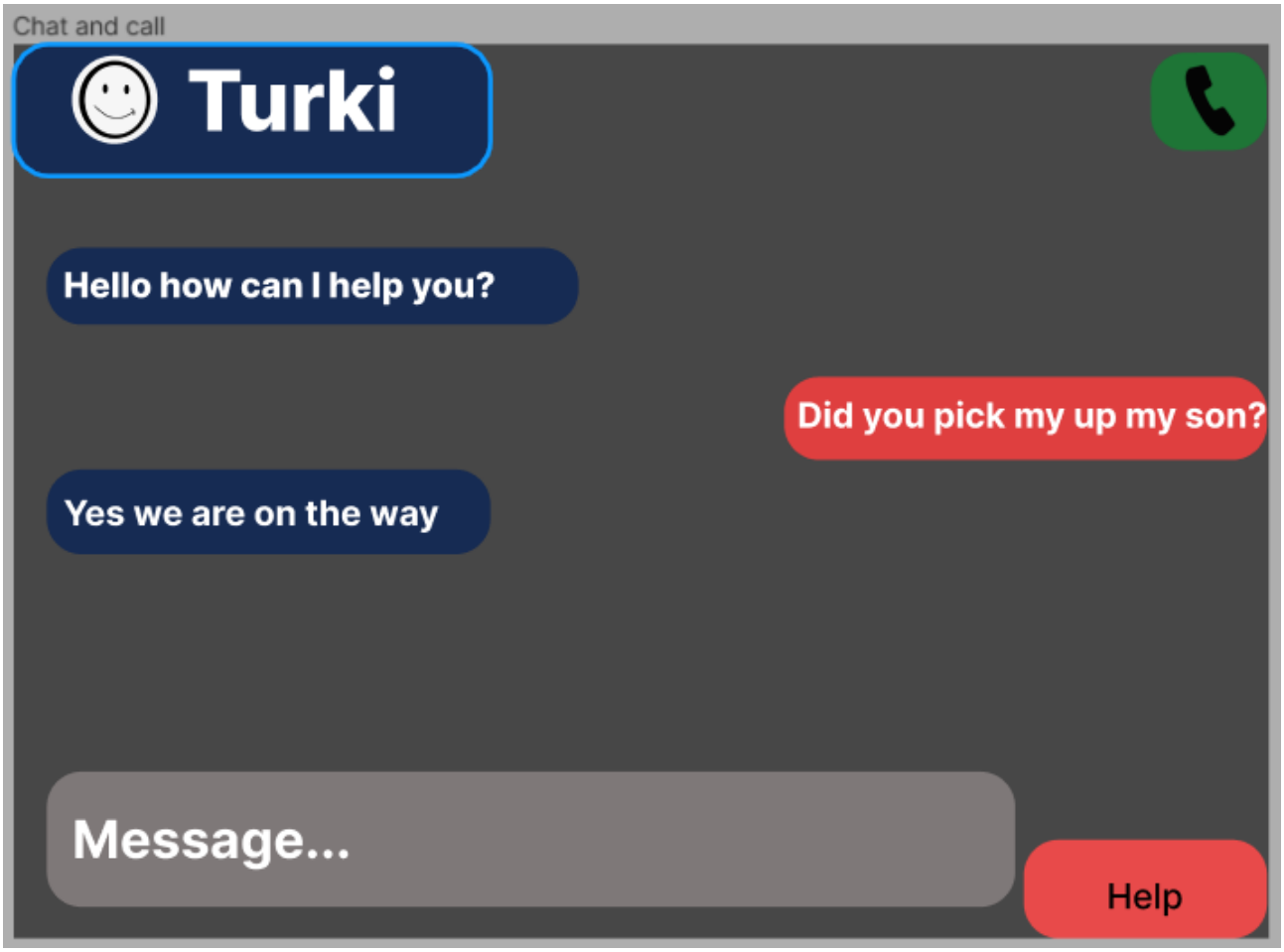



Buttons:

Accept: to accept the request for the ride.

Deny request: to deny the request for the ride.

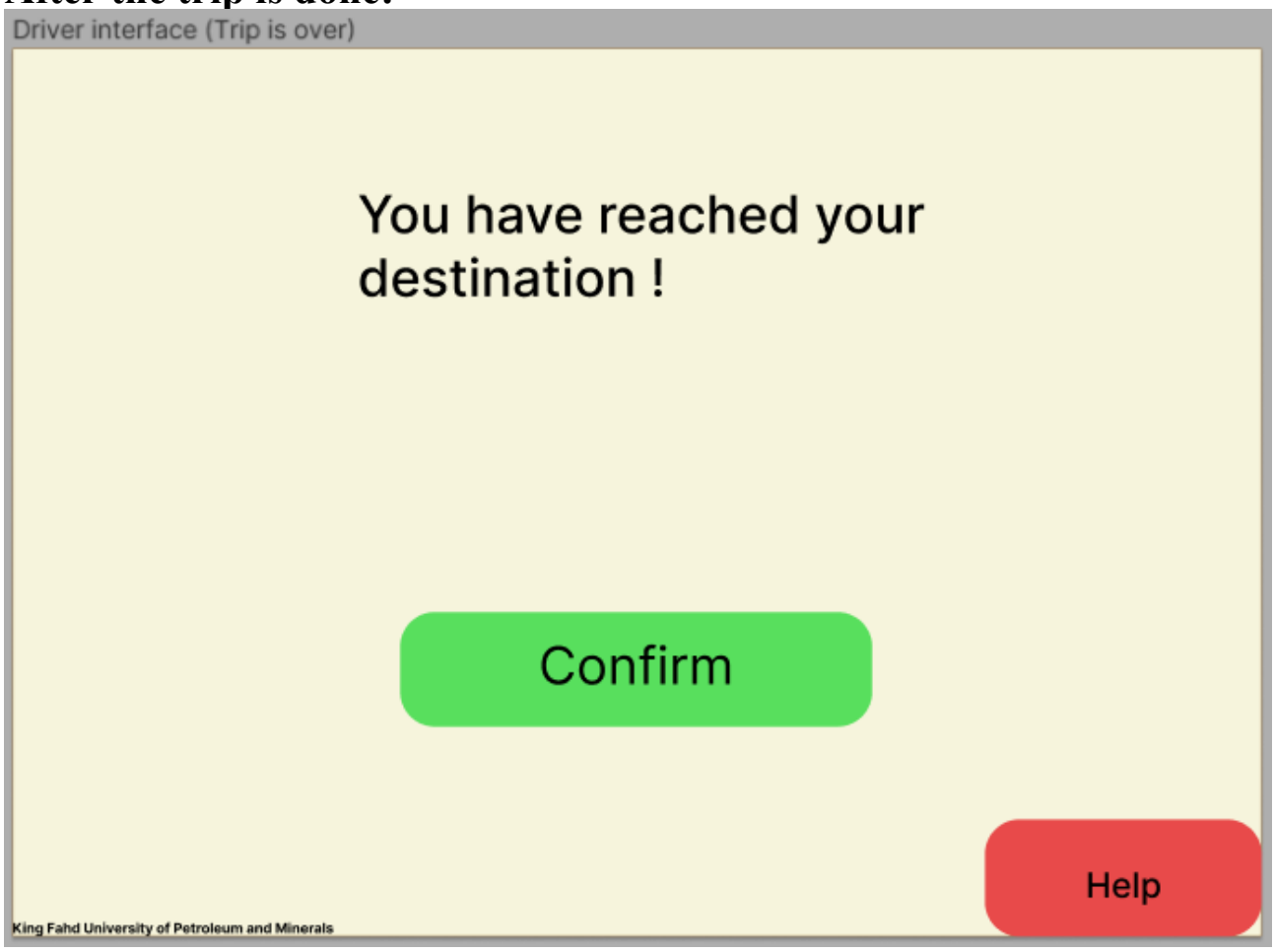
## Chat and call:



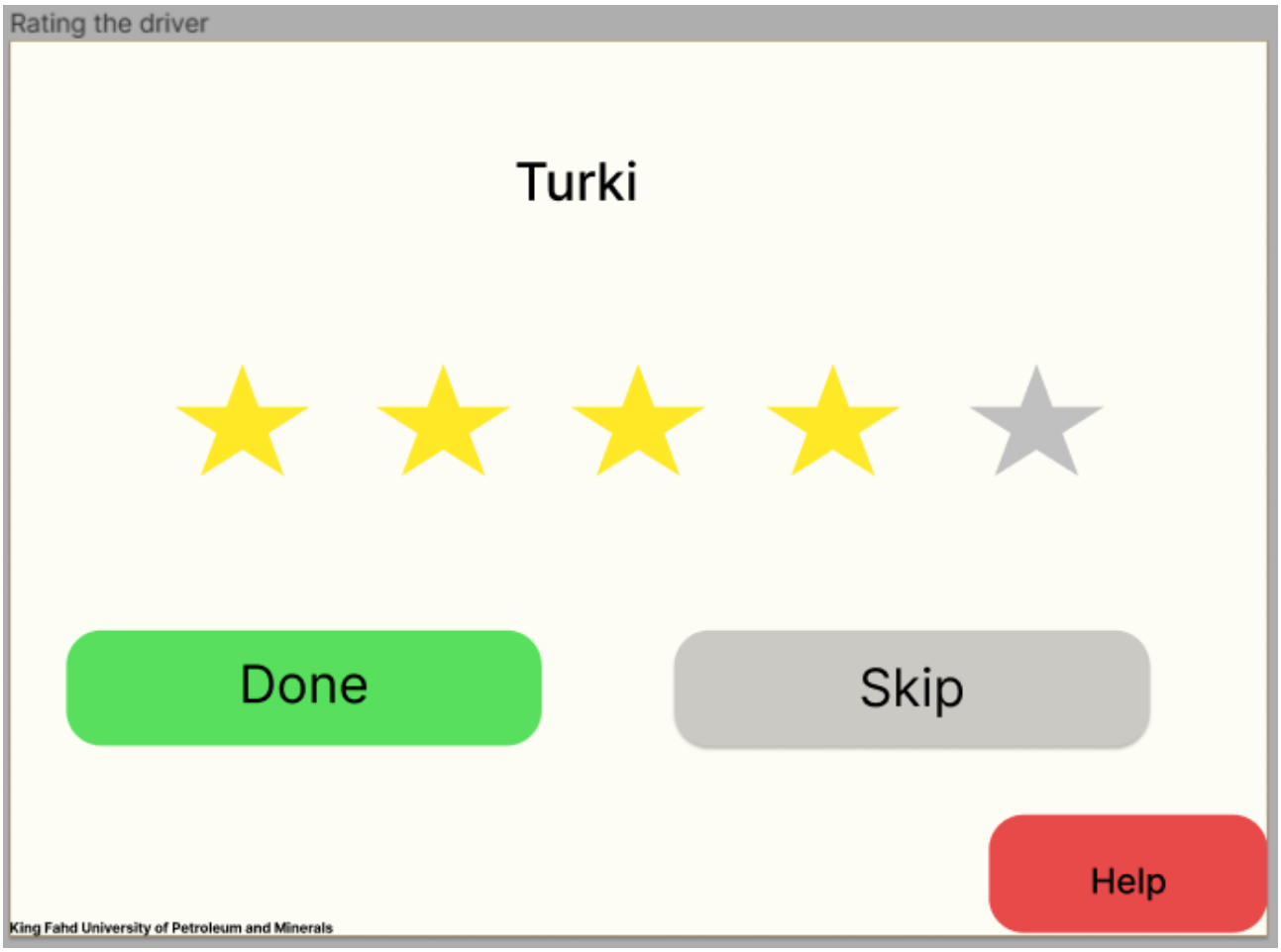

Buttons:

call: to contact the party via phone call.

## After the trip is done:



## Rate the driver:

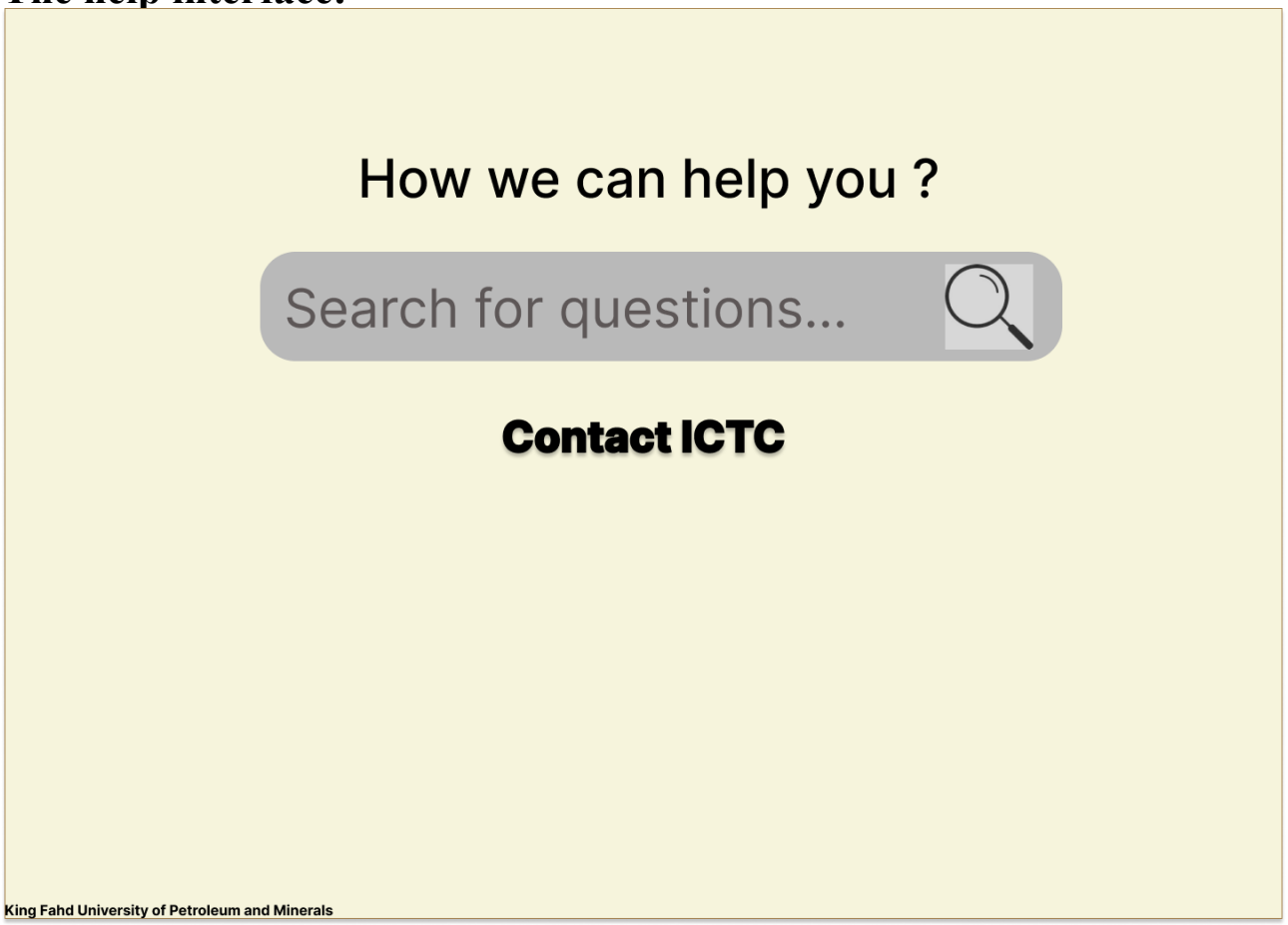



Buttons:

Done: To send the rating.

Skip: To avid rating the driver.

**The help interface:**




Buttons:

Contact ICTC: will lead the user to the ICTC page to contact them if needed.

## b. 5.2 Hardware Interfaces

All data needed by the software is stored in the main server. The software supports all types of smart devices that are running IOS or Android. The software uses the device GPS system to track rides.

## c. 5.3 Software Interfaces

The system will be available for windows, ios, android, and have a website.

The system will connect with the ICTC to extract the information of a first time login account and save the email, the car, and housing information in the main server.

The system will use google maps to get the direction for both school and child house.

### d. 5.4 Communications Interfaces

The communication between the app and the user will be using the KFUPM email and its message formatting. The communication between the parents and the drivers will be through a message window which will include the driver and the parents with end-to-end encrypted conversation. The synchronization mechanism used is condition variable.

# Appendix A: Glossary

(ICTC) Information and Communications Technology Council.