Software Requirements Specification

for

EPOKA Bus Reservation System

Version 1.0 approved

Prepared by Favio Kushta, Livia Kadisi,
Eriselda Deda, Arjola Sinaj, Viktoria Peshku

EPOKA University

03.06.2023

Table of Contents

1. Introduction

1.1 Purpose

The purpose of this document is to specify the software requirements for the bus reservation application developed for Epoka University. This document covers the scope of the entire bus reservation system, including both the user-facing application and the admin dashboard. It outlines the functionality and features of the application to guide the development process.

1.2 Document Conventions

This document follows standard conventions for software requirement specifications (SRS). It does not assume any specific typographical conventions or special formatting. Each requirement statement is self-contained and has its own priority, which is explicitly mentioned.

1.3 Intended Audience and Reading Suggestions

The intended audience for this document includes developers, project managers, testers, and other stakeholders involved in the development and deployment of the bus reservation application. Users and administrators of the system will also find this document useful to understand the functionality and features of the application.

The document is organized into several sections to provide a comprehensive overview of the software requirements. It is suggested to begin reading with the overview sections to get a high-level understanding of the system, followed by the more detailed sections relevant to each reader type. Developers may focus on the technical requirements and data models, while project managers may be interested in the functional requirements and project timeline.

1.4 Product Scope

The software being specified in this document is a bus reservation application designed specifically for Epoka University. The application allows Epoka University students to reserve bus seats on different routes and departure times. It also provides an admin dashboard for administrators to manage reservations and make announcements.

The primary purpose of the application is to streamline the bus reservation process and enhance the overall transportation experience for Epoka University students. The application aims to provide a user-friendly interface, efficient reservation management, and timely communication between the users and administrators.

The software aligns with the university's goals of providing convenient and reliable transportation services to its students, enhancing their experience and ensuring smooth campus commuting.

2. Overall Description

2.1 Product Perspective

The bus reservation application for Epoka University is a new, self-contained product designed to streamline the bus reservation process for university students. It is not a replacement for any existing systems but rather a standalone solution tailored to the specific needs of Epoka University. The application interacts with a database to store user information, reservation details, and route information. It also provides an interface for administrators to manage reservations and make announcements. The application is expected to interface with external components such as the Epoka email system for user authentication and communication.

2.2 Product Functions

- *User registration and login*
- *Password creation with specific requirements (uppercase, lowercase, number, symbol)*
- *Security question selection for password recovery*
- *Bus seat reservation selection by route, date, and departure time*
- *View, delete, or cancel reservations*
- *View announcements made by administrators*
- *Logout functionality*

2.3 User Classes and Characteristics

The anticipated user classes for the bus reservation application include:
Epoka University Students: They are the primary users of the application, utilizing its features to reserve bus seats, view their reservations, and receive announcements.
Administrators: They have elevated privileges and access to the admin dashboard. They manage reservations, make announcements, and oversee the overall functioning of the bus reservation system.

Users may vary in their technical expertise, but the application is designed to be user-friendly and accessible to a wide range of users. Some users may have higher privileges, such as administrators, while others will have limited access based on their user roles.

2.4 Operating Environment

The bus reservation application will operate in the following environment:
Hardware Platform: Any device capable of running a web browser, including desktops, laptops, tablets, and smartphones.
Operating System: The application should be compatible with popular operating systems such as Windows, macOS, iOS, and Android.
Software Components: The application relies on web browsers to access its interface and interact with the system. It should be compatible with major web browsers such as Google Chrome, Mozilla Firefox, and Safari.
The application must peacefully coexist with other software components or applications running on the user's device.

2.5 Design and Implementation Constraints

The design and implementation of the bus reservation application are subject to the following constraints:
Corporate or Regulatory Policies: The application must adhere to any corporate or regulatory policies governing data privacy, security, and accessibility.
Hardware Limitations: The application should operate efficiently within the hardware limitations of the target devices, considering factors such as timing requirements and memory usage.
Interfaces to Other Applications: The application may interface with external systems such as the Epoka email system for authentication and communication purposes.
Technologies and Tools: The application is implemented using PHP, JavaScript, and CSS. It relies on a MySQL database for data storage.
Security Considerations: The application should incorporate appropriate security measures to protect user data and prevent unauthorized access.

2.6 User Documentation

The following user documentation components will be delivered along with the software:
User Manuals: Comprehensive guides explaining the functionality and usage of the bus reservation application.
Online Help: Contextual help accessible within the application, providing assistance on specific features and procedures.
Tutorials: Step-by-step tutorials or interactive guides to help users understand and navigate the application's key features.
The user documentation will be provided in digital format, and the specific delivery formats and standards will be determined based on the platform and accessibility requirements.

2.7 Assumptions and Dependencies

Assumptions:
The Epoka University email system will be available and integrated for user authentication and communication purposes.
The database management system, such as PHPMyAdmin and XAMPP, will be properly set up and operational.
The routes and departure times have been pre-defined in the database and are accurate.

Dependencies:
The project may depend on third-party libraries or frameworks for certain functionalities, such as database connectivity or user authentication.
The availability and compatibility of web browsers on user devices are assumed, as the application relies on web browser access.

3. External Interface Requirements

3.1 User Interfaces

The bus reservation application will have user interfaces for both students and administrators.

Student User Interface:
Registration and Login Screens: Users will enter their Epoka University email and password to access the application.
Password Creation Screen: Users will create a password that meets the specified requirements (uppercase, lowercase, number, symbol).
Reservation Screen: Users will select the route, date, and departure time to reserve a bus seat.
View Reservation Screen: Users can view their current reservation details.
Delete Reservation Screen: Users can permanently delete their reservation from the history.
Cancel Reservation Screen: Users can cancel their reservation if needed.
Dashboard: Users will have a dashboard where they can view announcements made by administrators.

Administrator User Interface:
Login Screen: Administrators will enter their username and password to access the admin dashboard.
Reservations Screen: Administrators can view the reservations made for the day, on different routes and departure times.
Make Announcement Screen: Administrators can create and publish announcements that will appear in the user dashboard.
The user interfaces should follow a user-friendly and intuitive design, with appropriate error message displays and standard functions such as help and logout.

3.2 Hardware Interfaces

The bus reservation application does not have any direct hardware interfaces. It runs on devices capable of running a web browser, such as desktops, laptops, tablets, and smartphones.

3.3 Software Interfaces

The bus reservation application interfaces with the following software components:
Epoka University Email System: The application relies on the Epoka University email system for user authentication and communication purposes.
Database Management System: The application uses a MySQL database (via PHPMyAdmin and XAMPP) to store user information, reservation details, and route information.
Web Browsers: The application is accessed and used through web browsers, including Google Chrome, Mozilla Firefox, and Safari.

The data items shared across software components include user information, reservation details, and announcements. The specific implementation of data sharing and integration will be handled within the application using appropriate APIs and libraries.

3.4 Communications Interfaces

The bus reservation application requires the following communication interfaces:
Email Communication: The application may utilize email communication to send notifications and password recovery instructions to users. It may use standard email protocols such as SMTP (Simple Mail Transfer Protocol).
Web Browser Communication: The application communicates with users through web browsers, using HTTP (Hypertext Transfer Protocol) for request-response interactions.
Network Connectivity: The application requires internet connectivity for users to access the system, make reservations, and receive updates.

4. System Features

<This template illustrates organizing the functional requirements for the product by system features, the major services provided by the product. You may prefer to organize this section by use case, mode of operation, user class, object class, functional hierarchy, or combinations of these, whatever makes the most logical sense for your product.>

4.1 User Registration and Log In

4.1.1 Description and Priority

This feature allows users to register for an account using their Epoka University email and password and login to the system. It is of high priority as it is essential for user access and authentication.

4.1.2 Stimulus/Response Sequences

- *User clicks on the registration link.*
- *System presents the registration form.*
- *User enters their full name, Epoka University email, and password, selects security question and writes the answer.*
- *User submits the registration form.*
- *System validates the email format and checks if it is an Epoka University email.*
- *System checks if the email is already registered.*
- *If valid, the system creates a new user account and redirects the user to the login page.*
- *User clicks on the login link.*
- *System presents the login form.*
- *User enters their Epoka University email and password.*
- *User submits the login form.*
- *System validates the credentials.*
- *If valid, the system authenticates the user and redirects them to the user dashboard.*
- *If invalid, the system displays an error message.*

4.1.3 Functional Requirements

REQ-1: The system shall validate the email format during registration and display an error message if it is invalid.
REQ-2: The system shall check if the entered email belongs to Epoka University during registration and display an error message if it is not.
REQ-3: The system shall check if the email is already registered during registration and display an error message if it is.
REQ-4: The system shall securely store user passwords using appropriate hashing algorithms.
REQ-5: The system shall authenticate user credentials during login and display an error message if they are invalid.
REQ-6: The system shall redirect the user to the user dashboard upon successful login.
REQ-7: The system shall provide a "Forgot Password" functionality for users to reset their passwords.

4.2 Bus Reservation

4.2.1 Description and Priority

This feature allows users to reserve a bus seat by selecting the route, date, and departure time. It is of high priority as it is the core functionality of the application.

4.2.2 Stimulus/Response Sequences

- *User selects the "Reservation" option from the user dashboard.*
- *System presents the reservation form.*
- *User selects the desired route, date, and departure time.*
- *User submits the reservation form.*
- *The system creates a new reservation record for the user and displays a success message.*
- *If no seats are available, the system displays an error message.*

4.2.3 Functional Requirements

REQ-1: The system shall retrieve and display the available routes for reservation.
REQ-2: The system shall retrieve and display the available departure times for each route.
REQ-3: The system shall create a new reservation record for the user upon successful form completion check.

4.3 Bus Reservation Cancellation

4.2.1 Description and Priority

This feature allows users to cancel their bus reservations. It is of medium priority as it provides convenience to users but is not as critical as the reservation and login functionalities.

4.2.2 Stimulus/Response Sequences

- *User selects the "My Reservations" option from the user dashboard.*
- *System retrieves and displays the user's active reservations.*
- *User selects the reservation to cancel.*
- *User clicks on the "Cancel" button.*

4.2.3 Functional Requirements

REQ-1: The system shall retrieve and display the user's active reservations.
REQ-2: The system shall allow the user to select a reservation to cancel.
REQ-3: The system shall update the reservation status to "Cancelled" upon user cancellation.

4.4 Bus Schedule Display

4.2.1 Description and Priority

This feature allows users to view the bus schedule, including routes, departure times, and available seats. It is of low priority as it provides information but is not essential for the core functionality of the application.

4.2.2 Stimulus/Response Sequences

- *User selects the "Schedule" option from the user dashboard.*
- *System retrieves and displays the bus schedule, including routes, and departure times.*

4.2.3 Functional Requirements

REQ-1: The system shall retrieve and display the bus schedule information.
REQ-2: The system shall display the routes, departure times, and available seats for each schedule entry.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

The system should load the user dashboard within 2 seconds to provide a responsive user experience.
The system should process and confirm bus reservations in real-time, with a maximum delay of 5 seconds.
The system should handle a concurrent user load of at least 100 users without significant performance degradation.
The system should generate and display reports within 10 seconds, even for large data sets.

5.2 Safety Requirements

The system should prevent users from making overlapping reservations to avoid conflicts.
The system should have backup and recovery mechanisms to protect against data loss in the event of system failure.

5.3 Security Requirements

User passwords should be securely stored using industry-standard encryption algorithms.There is also a security question.

5.4 Software Quality Attributes

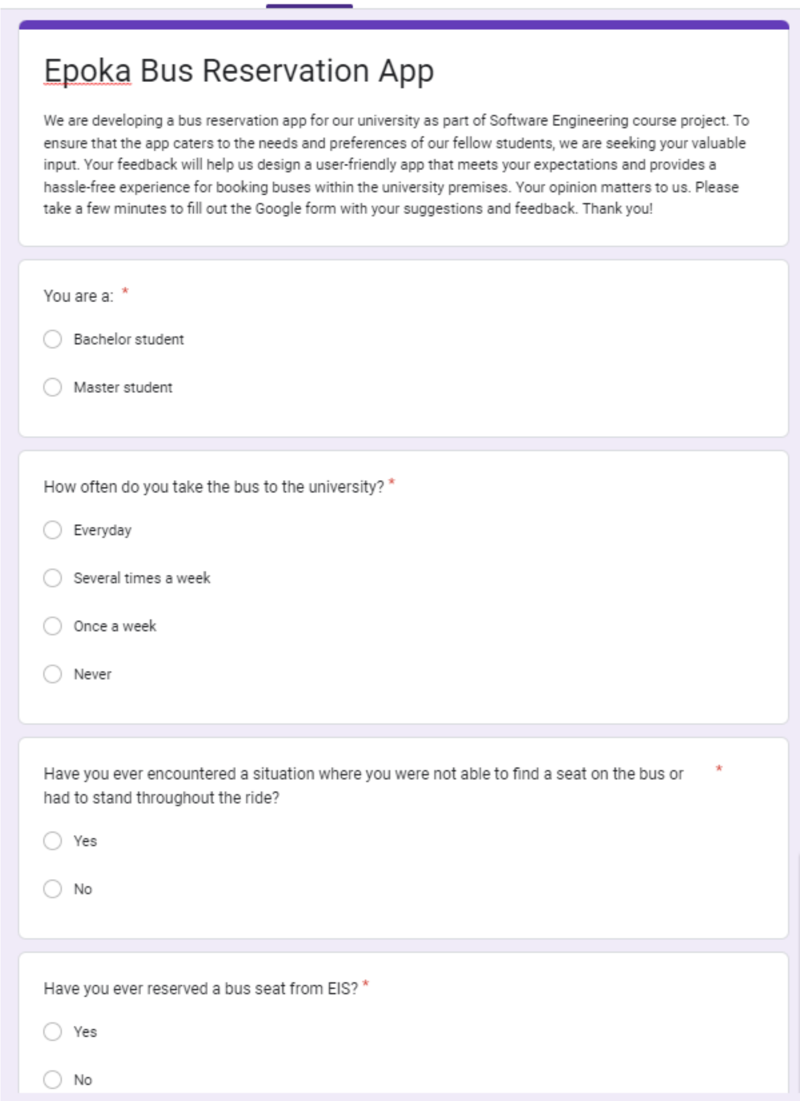
The system should be highly reliable, with a target uptime of at least 99.9%.
The system should be easily maintainable, with well-structured and modular code that allows for efficient bug fixes and updates.
The system should be highly usable, with an intuitive and user-friendly interface that requires minimal training for users.

5.5 Business Rules

Only registered and authenticated users should be able to make bus reservations.

Appendix: Glossary

These are the survey, user case, logo, and database schema we used:



Epoka Bus Reservation App

We are developing a bus reservation app for our university as part of Software Engineering course project. To ensure that the app caters to the needs and preferences of our fellow students, we are seeking your valuable input. Your feedback will help us design a user-friendly app that meets your expectations and provides a hassle-free experience for booking buses within the university premises. Your opinion matters to us. Please take a few minutes to fill out the Google form with your suggestions and feedback. Thank you!

You are a: *

○ Bachelor student

○ Master student

How often do you take the bus to the university? *

○ Everyday

○ Several times a week

○ Once a week

○ Never

Have you ever encountered a situation where you were not able to find a seat on the bus or had to stand throughout the ride? *

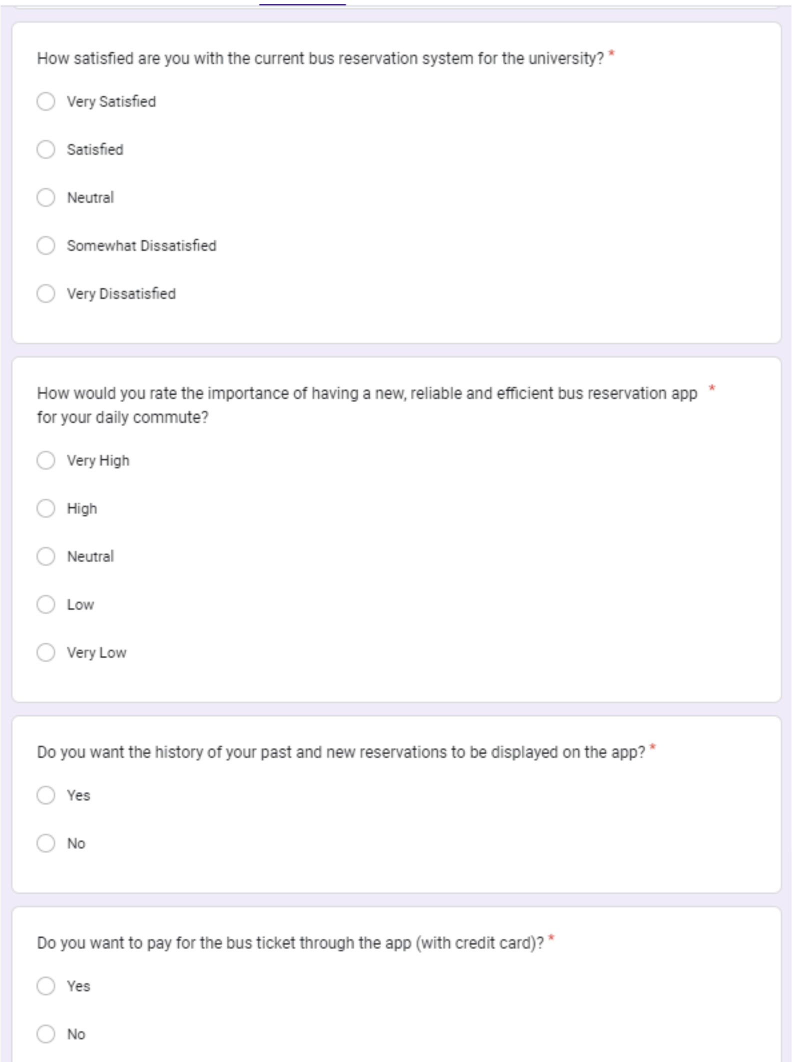
○ Yes

○ No

Have you ever reserved a bus seat from EIS? *

○ Yes

○ No



How satisfied are you with the current bus reservation system for the university? *

○ Very Satisfied

○ Satisfied

○ Neutral

○ Somewhat Dissatisfied

○ Very Dissatisfied

How would you rate the importance of having a new, reliable and efficient bus reservation app for your daily commute? *

○ Very High

○ High

○ Neutral

○ Low

○ Very Low

Do you want the history of your past and new reservations to be displayed on the app? *

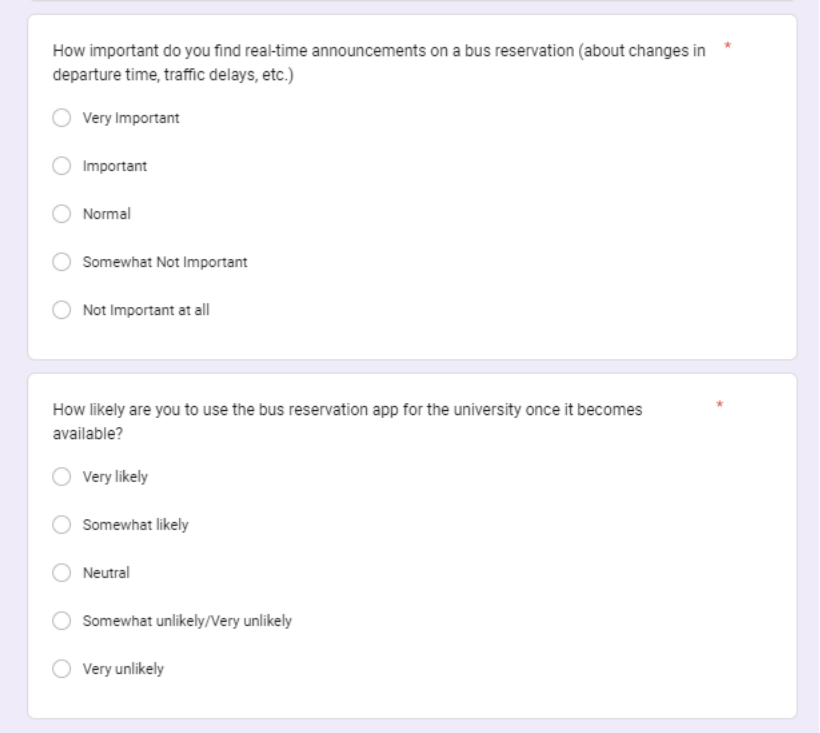
○ Yes

○ No

Do you want to pay for the bus ticket through the app (with credit card)? *

○ Yes

○ No



How important do you find real-time announcements on a bus reservation (about changes in departure time, traffic delays, etc.) *

○ Very Important

○ Important

○ Normal

○ Somewhat Not Important

○ Not Important at all

How likely are you to use the bus reservation app for the university once it becomes available? *

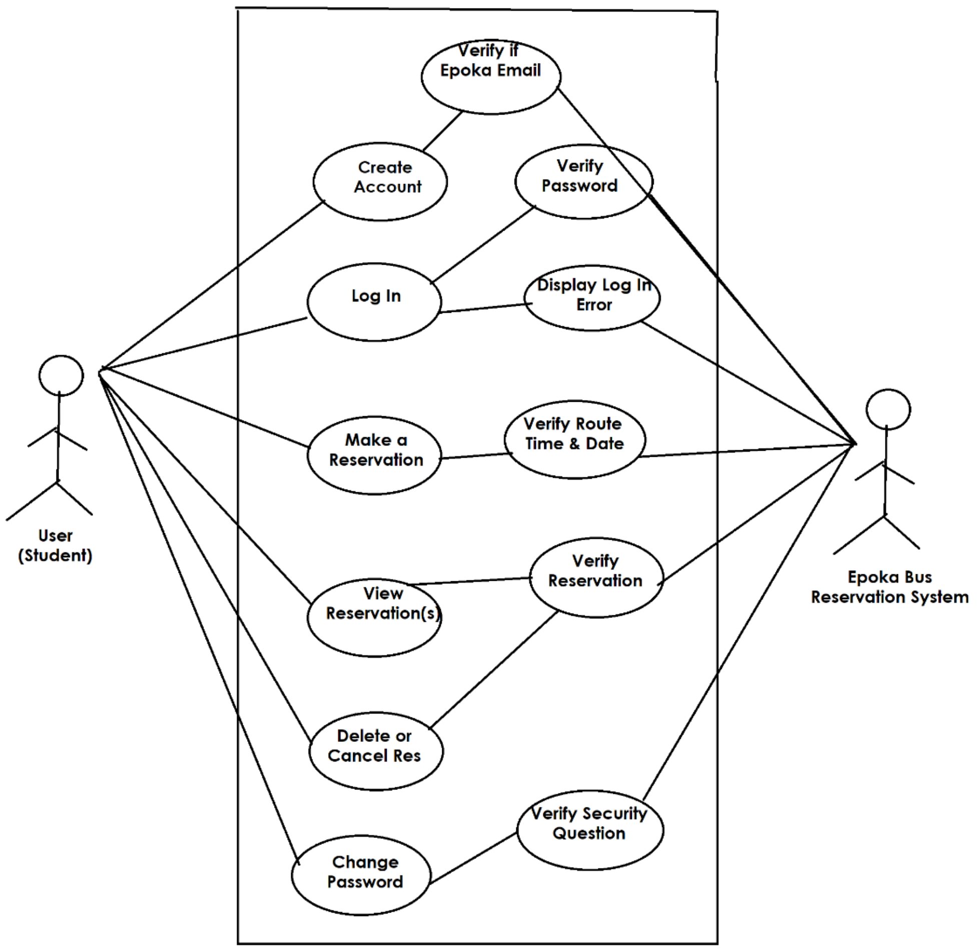
○ Very likely

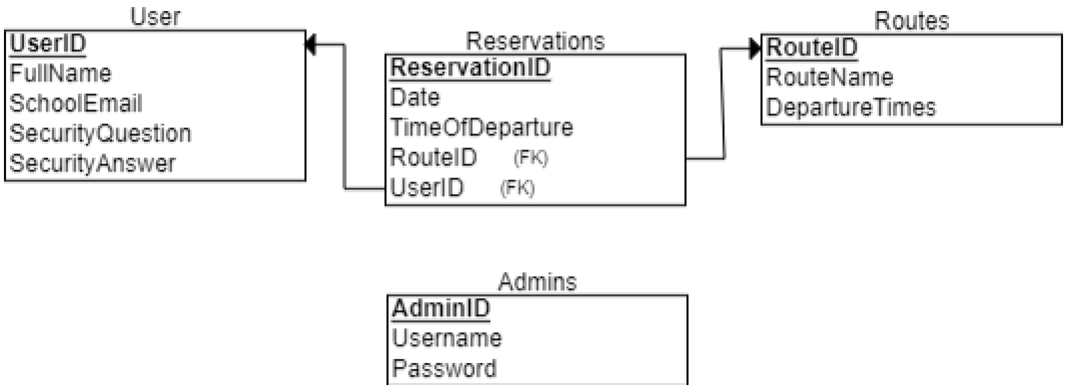
○ Somewhat likely

○ Neutral

○ Somewhat unlikely/Very unlikely

○ Very unlikely


Verify if Epoka Email
Create Account
Verify Password
Log In
Display Log In Error
Make a Reservation
Verify Route Time & Date
View Reservation(s)
Verify Reservation
Delete or Cancel Res
Verify Security Question
Change Password
User (Student)
Epoka Bus Reservation System


User
UserID
FullName
SchoolEmail
SecurityQuestion
SecurityAnswer
Reservations
ReservationID
Date
TimeOfDeparture
RouteID (FK)
UserID (FK)
Routes
RouteID
RouteName
DepartureTimes
Admins
AdminID
Username
Password