MYES Bus Ticketing System

Revision History

Date	Author(s)	Description	Version
11/04/2021	Mustafa Ilıkkan	Initial Version	v1.0
18/04/2021	Mustafa Ilıkkan	Iteration1 review's accepted changes have been fixed in the document.	v1.1
09/05/2021	Mustafa Ilıkkan	Addition of accepted changes from Iteration2 review.	v1.2
30/05/2021	Mustafa Ilıkkan	Added bus company management business rules section and updated external software interfaces section	v1.3
06/06/2021	Mustafa Ilıkkan	Addition of accepted changes from Iteration3 review.	v1.4

System-Wide Requirements Specification

1. Introduction

This document describes the system-wide requirements for MYES Bus Ticketing System. System-wide requirements include the non-functional requirements and functional requirements that are not expressed as use cases. Quality attributes of the system, high level interface definitions, business rules and system constraints are also

covered inside the document. The primary aim is to ensure that the needs of all of the stakeholders are represented in the requirements specification. This document also addresses the overlapping requirements that are related to the overall application such as user authentication or user interface scheme.

2. System-Wide Functional Requirements

2.1 Authentication

1. Users shall be authenticated by the system before they start using the system functions.
2. Authentication shall be provided by username and password pairs that will be entered by the user through the provided user interfaces.

2.2 Auditing

1. System level logs shall be recorded by the cloud provider.
2. Application level logs such as user login records and database logs shall be audited so that they can be inspected by the administrator.
3. All trip data shall be retained for at least 2 years.
4. System shall report system failures or malfunctions by using the cloud provider's monitoring infrastructure.

2.3 Reporting

1. Ticket sale records shall be queried and extracted as a report from the database if they are requested by government authorities.

2.4 Printing

1. Passenger users shall print their tickets, reservations, or invoices from the system. Printing requirements will be implemented in the second release of the system.

3. System Qualities

3.1 Usability

1. The system shall be understandable by users of age 15 or older.
2. The system shall be a Software-as-a-service (SaaS) application running on a web browser.
3. Accessibility guidelines recommended by the World Wide Web Consortium (W3C) shall be applied.
4. Data shall be validated for required fields in order to prevent errors.
5. Mandatory fields shall be indicated clearly.
6. Error messages shall be intuitive, unambiguous and standardized.
7. System shall have easy navigation and it shall be designed to allow only valid actions.
8. Calendars and date inputs, dropdown menus, password inputs shall be used where appropriate.
9. System language shall be English. The system shall use validators for inputs and language validation.
10. Dates and times shall be local to the country in which the bus company is operating.
11. The system shall be usable on mobile browsers. (this feature will be provided in the next version)

3.2 Reliability

1. System shall be available 99% of the operation time.

2. Failure rate shall be not more than one failure per 100 requests.
3. In case of a severe system failure, the system shall be up and running again in a maximum of 30 minutes.
4. The system shall ensure data integrity. A transaction shall be rolled back in case of a system failure during ticket reservation or sale. Incomplete transactions shall not be allowed to be committed.

3.3 Performance

1. System's response time for a user's request shall not exceed 5 seconds in a 4 Mbit internet connection.
2. The system shall be capable of serving 1000 users at a given time without exceeding the target response time.
3. The system shall scale smoothly for peak user traffic.

3.4 Supportability

1. The system shall be capable of running on cloud virtual machines.
2. The system shall be containerized and deployed as a container instance.
3. The system shall support Python 3 and Django 3.x versions.
4. The application shall run as a web application in Google Chrome browser (version 89 or later).
5. The frontend shall be valid HTML and CSS according to W3C standards.

3.5 Security

1. All network traffic shall be encrypted using secure hypertext transfer (https) protocol.
2. Passwords shall be stored in encrypted format in the database.
3. Endpoints of the system shall be secured and resources should be accessible only by the authenticated users.
4. Users shall access resources according to their authorization levels.

4. System Interfaces

4.1 User Interfaces

4.1.1 Look & Feel

1. Design shall be provided as a Sketch or Figma file.
2. Same color palette, font families, font styles, button styles and shadows shall be used across all views to achieve a consistent graphical user interface.
3. Colors shall have enough contrast so that they can be differentiated easily and text can be read without difficulty.

4.1.2 Layout and Navigation Requirements

1. Layout shall be responsive depending on the viewer's screen size.
2. System shall welcome the user with a landing page that includes login and signup options.
3. Navigation shall direct the user correctly for the selected flow of operations. (flows will include finctional requirements such as reserve a ticket, buy a ticket, manage buses, manage trips, manage drivers etc.)
4. Payment page will use the payment gateway's user interface (currently Stripe) which is not in our control.

4.1.3 Consistency

1. Layout shall be consistent across the application.
2. Layout shall include a header area, a footer area, a navigation part and a main content area.
3. Password inputs, date inputs with popup calendar boxes, dropdown select inputs, tooltips and information modals should be used consistently throughout the application.

4.1.4 User Personalization & Customization Requirements

1. There shall not be user customization. All users shall see the same graphical user interface.

4.2 Interfaces to External Systems or Devices

4.2.1 Software Interfaces

1. The system shall interact with external payment processors via their application programming interfaces (API).
2. The system shall be open for extension to use other APIs in future releases.
3. The payment processing will be handled by an external payment gateway.

4.2.2 Hardware Interfaces

1. There is no hardware interface for the system.

4.2.3 Communications Interfaces

1. The communication with the system shall be accomplished using Secure Hypertext Transfer Protocol (https) using a modern web browser.

5. Business Rules

5.1 Reservation Rules

5.1.1 <Reservation001>

Passengers could only reserve a seat that was not previously reserved by another passenger.

5.1.2 *<Reservation002>*

During reservation flow, the selected seat should be allocated by the system for 15 minutes so that no other passenger could buy the same seat.

5.1.3 <Reservation003>

Any reservation can be cancelled unless there are 24 hours left to the trip date.

5.1.4 <Reservation004>

Same user cannot have more than 5 active reservations in a given time. (active reservation means the

reservation not committed yet)

5.2 Buying Ticket Rules

5.2.1 <BuyingTicket001>

A reservation can be ticketed only one time. After the reservation is converted to a ticket, it is not a reservation anymore.

5.3 Bus Management Rules

5.3.1 <BusManagement001>

A bus driver cannot be assigned to more than one bus during the same timeframe.

5.3.2 <BusManagement002>

There should be a minimum 12 hours of resting time between trips of the same bus driver.

5.4 Trip Management Rules

5.4.1 <TripManagement001>

A bus cannot be assigned to more than one trip at the same timeframe.

5.4.2 <TripManagement002>

There should be a minimum 4 hours maintenance gap between trips for the same bus.

5.5 Login/Signup Rules

5.5.1 <LoginSignup001>

Passwords should be at least 8 characters long and include at least one capital letter, one small letter and one numeric character.

5.5.2 <LoginSignup002>

The users signing up for the system should use a valid email address.

5.6 Bus Company Management Rules

5.5.1 <BusCompanyManagement001>

More than one bus company can use the system, but the system should not allow two bus companies with the same name. (Bus company name should be unique)

6. System Constraints

1. The system should be implemented by Python programming language version 3.
2. Django framework version 3.0 or above should be used for the backend implementation.
3. Frontend should be implemented using HTML, CSS and JavaScript.
4. A relational database (SQLite) should be used as the database.
5. System should work on Chrome (version 89 or later versions).

7. System Compliance

7.1 Licensing Requirements

In the development phases of this software, all the software components used shall have an open source license. Therefore, there shall not be any requirements or issues regarding the licenses of the software component used in the system.

7.2 Legal, Copyright, and Other Notices

All rights of the system belong to MYES Inc. company. Copying and distributing the application and materials used in the development are strictly prohibited and subject to legal penalties.

7.3 Applicable Standards

There shall not be any specific standards used in the development of this software application.

8. System Documentation

The system documentation shall be provided for the Passenger users inside the application as Question-Answer manner. Possible questions of the Passenger users shall be accessible by clicking on a provided link inside the application. For the Bus company users, some online hands-on training shall be planned and additional staff members shall be provided so there shall not be any documentation needs for them. All documentation shall be created by a separate documentation team which will be formed by the Project Manager after the Transition iteration.