Software Requirements Specification

for

Bus Ticket Reservation System

Version 1.0 approved

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

This Software Requirements Specifications (SRS) discusses the complete collection of specifications and functions that comprise the Bus Ticket Reservation System. Starting from interfaces to back end processes, explanations in this document will provide users sufficient understanding about the product's commercial and technical aspects.

1.2 Document Conventions

Chapter labels and section names are written alongside their corresponding numbers. For distinctive purposes, the former is printed larger than the latter. The underlined ones are the subcategories whose characteristics are discussed.

1.3 Intended Audience and Reading Suggestions

This SRS was created for the users of the system, client, administrators and developers. The document is mainly divided into two parts, the representational aspects and technical parts of the product. These representational aspects provide the users the model which all elements are integrated. Underlying processes of the model are found in the technical side of the document.

1.4 Product Scope

This bus ticketing system is designed to aid users in making their transactions and reservations online easier and more efficient. The system allows users to find and book the trips they want. They can even manage their account and see the history of their booking.

For the administrators, the system could be used to manage which buses will be used, what will be the destinations, who are in what bus and many more.

1.5 References

2. Overall Description

2.1 Product Perspective

The Bus Ticket Reservation System is a new system that will aid passengers to book their trips online. It aims for a faster and easier access of information of trips such as available seats and status of trip. Passenger may book his/her trip by coordinating with a travel agency. Moreover, it allows the passengers to contact the bus company administrator through email. Each bus company that uses the system has its own administrator that manages all the information needed to display trips. On the other hand, the super administrator provides permission to bus company administrators. The context diagram below illustrates the users and major operations that the system will provide.

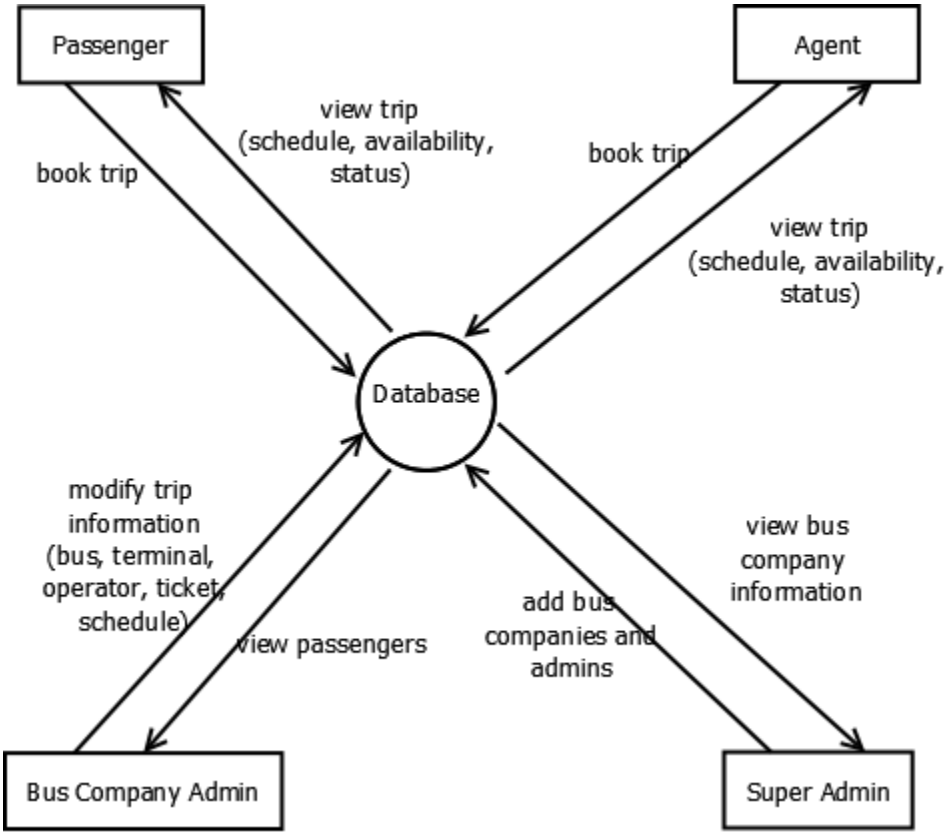


Figure 1. Context Diagram of the System

2.2 Product Functions

PF-1: Booking of trips
PF-2: Viewing of trip information (e.g. status of trip, available seats, terminals, fare, availability, location statistics)
PF-3: Retrieval of booking history
PF-4: Modify basic information of users
PF-5: Messaging system

2.3 User Classes and Characteristics

Passengers

Passengers are users whose requests are put to the system for management. The data they supply includes the basic information needed for booking trips. Passengers have the ability to choose whether to pay their booked trip online(by paypal) or through personal payment in respective terminals. The system can support closely up to an unlimited number of passengers(depending on hard disk size in the servers) and is expected that up to 90% of users are passengers.

Agents

Agents are travel agency employees who can book trips by the request of a passenger. The functionalities that can be accessed by agents are limited and their primary job is to book trips for their clients.

Bus company administrators

Bus company administrators are those that input trip information. They can be any employee appointed by the bus company. Most of the functionalities on modifying trip, buses information and ticketing are managed by these users.

Super administrator

There is only one super administrator for the system. S/He is the user that has access to everything in the database and the one that can add bus company and respective administrators.

2.4 Operating Environment

The software will function on any operating system that has the following web browsers: all major browsers (Safari, Chrome, Firefox, Opera, Internet Explorer). Other browsers might work but they are not fully supported. It is preferred that the web browser is updated to the latest version. There are no specific hardware requirements as long as the client computer and smartphone can handle the web browser. There are no other software requirements that must open to be able to use the system. The server will be run using XAMPP with Apache Webserver.

2.5 Design and Implementation Constraints

DC-1: The design of the system is as simple as possible yet creative to provide ease of access to the users.
IC-1: The system uses CodeIgniter.
IC-2: All scripts are written in JavaScript, PHP or AJAX.
IC-3: Some of the system's features are bounded to the features presented in the project specifications.
IC-4: The implementation is carefully modularized for the proper distribution to the different programmers.
IC-5: Programming standards and conventions are set within the team of programmers and are patterned as much as possible with the current software engineering design conventions.

2.6 User Documentation

UD-1: The system will come with a hardcopy and online manual intended for the users of the system. These manuals will feature the different functions of the system and how to use them.
UD-2: The whole system will also have an SRS documentation together with different UML diagrams.
UD-3: The code will be as fully documented per module as possible in order to help the maintenance and proper debugging.
UD-4: A readme file will also be provided to describe the general logic of the system and the code.

2.7 Assumptions and Dependencies

D-1: The consistency of data of trips is dependent on the operations made by the bus company administrators.
D-2: The system data is dependent on the data encoded by the passenger or agent by which all information that will be presented on the system is solely based on the user's input and some derived from it.

3. External Interface Requirements

3.1 User Interfaces

The system consists of several pages, each of which are only viewable by users who are authorized to view them (i.e., an administrator can access administrator pages (modules), while non-administrator users may not and will only have limited access to pages of the site). Aside from providing a 'Help' page and a user manual, the system's user interface is kept as simple and easy to understand as possible, to ensure that even new users of the system will need very little time to familiarize himself/herself with the system. The system shall also guide the user whenever possible, by providing adequate prompts and error messages when necessary.

To avoid troubling the user, only the most essential information for completing a transaction shall be asked for.

3.2 Hardware Interfaces

Server Side

The system is connected to the developers' MySQL database. It is compatible with any standard computer system.

Client Side

The system is a web based application; users are required to use a modern web browser such as Mozilla Firefox, Internet Explorer, Google Chrome and any other web browser that can support HTML5.

3.3 Software Interfaces

Client Side

An OS capable of running a modern web browser which supports HTML5.

3.4 Communications Interfaces

CI-1: The system shall send an e-mail to any user who has forgotten his/her password and has requested to generate a new password.

CI-2: The system shall send an e-mail to a user once he/she has successfully registered an account.

CI-3: The system shall send an e-mail to subscribers of the system's newsletter feature whenever necessary.

4. System Features

The following section identifies the features that will be available to the users of the system. System features are organized by use cases so that the main functions of the system will be understandable. Some features will not be available to all users of the system.

4.1 Creation of Account

4.1.1 Description and Priority

This feature allows a user to create his / her account by signing-up and filling in the required information. The data s/he must supply depends on the role s/he will choose:

Passenger:

Basic Information (First name, Middle Name, Last Name, Username, Password, Email Address, Phone Number, Birthday, etc)

Bus Company / Travel Agency Admin:

Basic Information (First name, Middle Name, Last Name, Username, Password, etc)

Data to be supplied are not limited to the details above. Priority = High.

4.1.2 Stimulus/Response Sequence

Stimulus: User creates an account through sign-up page. S/he supplies data per information field.

Response: System validates the data supplied by the user and if the account is already existing.
If data are valid, user is directed to home page and has successfully created his/her account.
Else, system displays an error message and asks user to supply valid information again.

4.1.3 Functional Requirements

REQ-1: User should have web browser (Chrome, IE, Firefox, Netscape, Opera, etc.) to access the system.

REQ-2: User should have a unique password with at least ten (10) characters and a unique username with atleast eight (8) characters.

REQ-3 Database must be updated all the time.

4.2 Log in / Log out

4.2.1 Description and Priority

This feature allows the user to access his / her account and at the same allows him / her to log out once the intended transaction by the user has been finished. Priority = High.

4.2.2 Stimulus/Response Sequence

Stimulus: User supplies data (username and password).

Response: System validates the data supplied by the user.
If data are valid, user is directed to his / her home page, which will depend on the type of user who logged in.
Else, system displays an error message and asks user to supply valid information again. If the log out option is clicked, session data and cookies are cleared and the user is once again taken to the default home page of the site.

4.2.3 Functional Requirements

REQ-1: User should input valid information (e.g. username and password. The supplied information will be checked to see if there corresponding username and password stored in the database).

4.3 View Passenger Account

4.3.1 Description and Priority

This feature allows the passenger to view his / her account that contains information that the passenger had supplied upon sign up or updating his / her account. Priority = High.

4.3.2 Stimulus/Response Sequence

Stimulus: Passenger chooses what information to view (e.g. passenger's booked trips, history of booking, current trip status, passenger profile, etc)

Response: System checks the type of user account through session data and cookies to allow and verify safe viewing of data.

4.3.3 Functional Requirements

REQ-1: The user should have a valid account and should be of passenger type.

REQ-2: The passenger must be logged in to his / her account.

4.4 Modify User Information

4.4.1 Description and Priority

This feature provides the users to add, edit, and delete information (basic information). This information will be used by other users to attend to their needs as well. Priority = High.

4.4.2 Stimulus/Response Sequence

Stimulus: User supplies data.

Response: System validates the data supplied by the user.
If data are valid, user is directed to updated view page of information updated.
Else, system displays an error message and asks user to supply valid information again.

4.4.3 Functional Requirements

REQ-1: User should input valid information (e.g. For first/last name, user should input alphabetic characters only).

REQ-2: User cannot delete his/her first and last name then leave it unanswered.

REQ-3: The user should have a valid account and should be of passenger type.

REQ-4: The user must be logged in for him / her to edit his / her account.

REQ-5 Database must be updated all the time.

4.4 Changing Password

4.4.1 Description and Priority

This feature provides the users to change his password. Priority = Medium.

4.4.2 Stimulus/Response Sequence

Stimulus: User wants to change his/her password and supplies necessary information.

Response: System validates the data supplied.
If data supplied does not match the current password, asks the user to provide data again.

4.4.3 Functional Requirements

REQ-1: User should supply password that matches the old/current password.

REQ-2: User should supply password that matches the provided new password.

REQ-3: Database must be updated all the time.

4.5 Contact Management / Bus Company Administrator

4.5.1 Description and Priority

This feature provides the users to exchange messages regarding on their inquiries. This feature assists the queries of the users regarding on their account. This will make the communication between the user and the administrators easier. Priority = High.

4.5.2 Stimulus/Response Sequence

Stimulus: User sends message to the administrator.

Response: System gets the message and stores the message to the database.
Administrator accesses the database and looks for new messages and responds to them by sending message also.

4.5.3 Functional Requirements

REQ-1: User must supply valid data (Message Subject, Message Body)

4.6 Reservation of Trip (Passenger)

4.6.1 Description and Priority

This feature allows the passenger to reserve for a trip based on his / her chosen date, origin and destination upon checking that there are still available slots based on the passenger's preferences. Priority = High.

4.6.2 Stimulus and Response

Stimulus: The passenger supplies necessary information for his / her preferred trip and seat.

Response: The system will return a page return a page containing schedules of the possible trips that the passenger can choose based on his / her preferences, if there are any. Once the passenger has chosen a trip schedule and seat, the chosen seat will be marked as taken and the number of available seats for the said trip will be updated. The passenger will be asked for his / her mode of payment. Once payment mode has been set and verified and all accounts have been settled, the passenger will see a link leading to a PDF that contains the trip ticket that he / she needs to print.

4.6.3 Functional Requirements

REQ-1 User must be logged in and should be of passenger type.

REQ-2 Database must be updated all the time.

4.7 View Terminals

4.7.1 Description and Priority

This feature allows the users to view the terminals situated all over the country or nearest to them. Priority = Medium.

4.7.2 Stimulus and Response

Stimulus: The user clicks on the option for viewing the terminals.

Response: The system will return a page return a page containing all the terminals that are stored in the database.

4.7.3 Functional Requirements

REQ-1 User can still access the page even though he / she is not logged in.

REQ-2 Database must be updated all the time.

4.8 View Schedules

4.8.1 Description and Priority

This feature allows the user to view all the available schedules based on the preferences that he/ she selected. Priority = High.

4.8.2 Stimulus and Response

Stimulus: User supplies or selects his / her preferences (e.g. data of departure, origin, destination, etc).

Response: System returns available trip schedule based on his / her preferences.

4.8.3 Functional Requirements

REQ-1 User can still access the page even though he / she is not logged in.

REQ-2 Database must be updated all the time.

4.9 View Newsletter

4.9.1 Description and Priority

This feature allows the passenger to view the available newsletters, whether unread or not. Priority = Low.

4.9.2 Stimulus and Response

Stimulus: Passenger clicks on the option for viewing newsletters.

Response: System returns available newsletters for the user.

4.9.3 Functional Requirements

REQ-1 User can only access newsletters when he / she is logged in and user must be of passenger type.

REQ-2 Database must be updated all the time.

4.10 View Location Statistics

4.10.1 Description and Priority

This feature allows the user to view the most frequently visited destinations based on consolidated user records. Priority = Low.

4.10.2 Stimulus and Response

Stimulus: User clicks on the option for viewing location statistics.

Response: System returns a map wherein the most frequently visited destinations are pinned on the map.

4.10.3 Functional Requirements

REQ-1 User can still access the page even though he / she is not logged in.

REQ-2 Database must be updated all the time.

4.11 Reservation of Trip (Agent and Bus Company Administrator)

4.11.1 Description and Priority

This feature allows the reservation of trips via the travel agency agent or through the bus company administrator. Priority = High.

4.11.2 Stimulus and Response

Stimulus: The agent/bus company administrator supplies necessary information which was provided to him / her by his / her client.

Response: The system will return a page return a page containing schedules of the possible trips that the passenger can choose based on his / her preferences, if there are any. Once the agent/bus company administrator has chosen a trip schedule and seat, the chosen seat will be marked as taken and the number of available seats for the said trip will be updated. Once payment mode has been set and verified and all accounts have been settled, the agent / bus company administrator will see a link leading to a PDF that contains the trip ticket that he / she needs to print.

4.11.3 Functional Requirements

REQ-1 User must be logged in and should be of travel agency agent / bus company administrator type.

REQ-2 Database must be updated all the time.

4.12 Bus Manager

4.12.1 Description and Priority

This feature allows the bus company administrator to add, edit information or delete busses. Priority = High.

4.12.2 Stimulus and Response

Stimulus: The bus company administrator chooses whether to add, edit or delete busses that are registered in the database.

Response: If the bus company administrator chooses to add new busses to the database, the bus company administrator is asked to provide the necessary information that corresponds to the new busses (plate number, type, capacity, etc). Else if the bus company administrator chooses to edit existing information regarding the busses, the bus company administrator will be asked once again to fill in the necessary information for the field to be edited. If the delete option is chosen by the bus company administrator, he / she is asked to choose which busses to delete. All changes made will be reflected in the database.

4.12.3 Functional Requirements

REQ-1 User must be logged in and should be bus company administrator type.

REQ-2 Database must be updated all the time.

4.13 Travel Schedule Manager

4.13.1 Description and Priority

This feature allows the bus company administrator to add, edit or delete travel schedules and add stopovers for a certain trip schedule. Priority = High.

4.13.2 Stimulus and Response

Stimulus: The bus company administrator chooses whether to add, edit or delete travel schedules that are registered in the database.

Response: If the bus company administrator chooses to add a new trip schedule to the database, the bus company administrator is asked to provide the necessary information that corresponds to the new travel schedule (e.g., trip time, date, origin, destination, etc.). Else if the bus company administrator chooses to edit existing trip schedule information, the bus company administrator will be asked once again to fill in the necessary information for the field/s to be edited. If the delete option is chosen by the bus company administrator, he / she is asked to choose which trip schedules to delete. Also, additional stopovers for a certain trip can be added by using this manager. All changes made will be reflected in the database.

4.13.3 Functional Requirements

REQ-1 User must be logged in and should be bus company administrator type.

REQ-2 Database must be updated all the time.

4.14 Bus Company Information Manager

4.14.1 Description and Priority

This feature allows the bus company administrator to add or edit the bus company information. Priority = High.

4.14.2 Stimulus and Response

Stimulus: The bus company administrator chooses whether to add, edit or delete bus company information that is registered in the database.

Response: If the bus company administrator chooses to add a new trip schedule to the database, the bus company administrator is asked to provide additional or new information regarding the bus company (e.g. company, date established, description, etc). Else if the bus company administrator chooses to edit existing information, the bus company administrator will be asked once again to fill in the necessary information for the field/s to be edited. All changes made will be reflected in the database.

4.14.3 Functional Requirements

REQ-1 User must be logged in and should be bus company administrator type.

REQ-2 Database must be updated all the time.

4.15 Operator Manager

4.15.1 Description and Priority

This feature allows the bus company administrator to add, edit or delete operators that are registered in the database. Priority = High.

4.15.2 Stimulus and Response

Stimulus: The bus company administrator chooses whether to add, edit or delete operators that are registered in the database.

Response: If the bus company administrator chooses to add a new operator, the bus company administrator is asked to provide the necessary information that corresponds to the new operator entry (e.g., name, job, etc.). Else if the bus company administrator chooses to edit existing operator information, the bus company administrator will be asked once again to fill in the necessary information for the field/s to be edited. If the delete option is chosen by the bus company administrator, he / she is asked to choose which operator/s to delete. All changes made will be reflected in the database.

4.15.3 Functional Requirements

REQ-1 User must be logged in and should be bus company administrator type.

REQ-2 Database must be updated all the time.

4.16 News and Events Manager

4.16.1 Description and Priority

This feature allows the bus company administrator to add, edit or delete news and events that will be available for user viewing once published. Priority = Low.

4.16.2 Stimulus and Response

Stimulus: The bus company administrator chooses whether to add, edit or delete news and events that are saved in the database.

Response: If the bus company administrator chooses to add a new event or news, the bus company administrator is asked to provide the necessary information that needed for the new entry (e.g. title, date, content, etc). Else if the bus company administrator chooses to edit existing news or event information, the bus company administrator will be asked once again to fill in the necessary information for the field/s to be edited. If the delete option is chosen by the bus company administrator, he / she is asked to choose which news or event to delete. All changes made will be reflected in the database.

4.16.3 Functional Requirements

REQ-1 User must be logged in and should be bus company administrator type.

REQ-2 Database must be updated all the time.

4.17 Newsletter Manager

4.17.1 Description and Priority

This feature allows the bus company administrator to add, edit or delete newsletters that are sent to the users. Priority = Low.

4.17.2 Stimulus and Response

Stimulus: The bus company administrator chooses whether to add, edit or delete newsletters that are saved in the database.

Response: If the bus company administrator chooses to add a newsletter, the bus company administrator is asked to provide the necessary information that is needed for the new entry (e.g. title, date, content, etc). Else if the bus company administrator chooses to edit existing newsletter, the bus company administrator will be asked once again to fill in the necessary information for the field/s to be edited. If the delete option is chosen by the bus company administrator, he / she is asked to choose which newsletter to delete. All changes made will be reflected in the database.

4.17.3 Functional Requirements

REQ-1 User must be logged in and should be bus company administrator type.

REQ-2 Database must be updated all the time.

4.18 View Passenger

4.18.1 Description and Priority

This feature allows the bus company administrator to view passengers based on their schedule, bus number, trip number and destination. Priority = Medium.

4.18.2 Stimulus and Response

Stimulus: The bus company administrator selects a link / option that allows that allows him / her to view the passengers based on the preferences / constrained chosen by the administrator.

Response: The system returns a list of passengers that matches the specified constraint entered by the bus company administrator.

4.18.3 Functional Requirements

REQ-1 User must be logged in and should be bus company administrator type.

REQ-2 Database must be updated all the time.

4.19 View / Delete Messages

4.19.1 Description and Priority

This feature allows the bus company administrator to view and delete messages sent by the users via the Contact Us option. Priority = Medium.

4.19.2 Stimulus and Response

Stimulus: The bus company administrator selects a link / option that allows that allows him / her to view or delete messages sent to him / her.

Response: If the view option is selected, the whole message body is shown to the administrator as well as the link for replying to the message. If the delete option is selected, the bus company administrator is asked to choose which messages are to be deleted.

4.19.3 Functional Requirements

REQ-1 User must be logged in and should be bus company administrator type.

REQ-2 Database must be updated all the time.

4.20 Issue / Print Ticket

4.20.1 Description and Priority

This feature allows the bus company administrator to issue or print a ticket for a client or passenger. This is also useful during the cases where in a ticket becomes lost due to any untoward incidences. Priority = High.

4.20.2 Stimulus and Response

Stimulus: The bus company administrator enters the name of the passenger to whom the ticket is issued to.

Response: The system returns trip schedule/s wherein a passenger that has purchased a ticket matches with the information that has been supplied by bus company administrator. Once the client / passenger, at the same time the bus company administrator, has chosen and verified which of the trip schedule ticket/s should be issued again, the bus company prints the ticket which brings the transaction to an end. If the name supplied by the bus company administrator does not match any person in any trips in the database, an error message is returned by the system.

4.20.3 Functional Requirements

REQ-1 User must be logged in and should be bus company administrator type.

REQ-2 Database must be updated all the time.

4.21 Add / Delete Gallery Images

4.21.1 Description and Priority

This feature allows the bus company administrator add or delete gallery images (photos of busses, etc). Priority = Low.

4.21.2 Stimulus and Response

Stimulus: The bus company administrator clicks or selects an option / link that will allow him / her to add or delete or user.

Response: If the bus company administrator chooses to upload an image, said image will be uploaded or saved to the database and the system will return a message

indicating that the image has been saved. If he / she choose to delete an image, the bus company administrator will be asked to choose which image/s is / are to be deleted from the database.

4.21.3 Functional Requirements

REQ-1 User must be logged in and should be bus company administrator type.

REQ-2 Database must be updated all the time.

4.22 Ticket Manager

4.22.1 Description and Priority

This feature gives the bus company administrator an easy way of managing tickets, modifying ticket information (such as change of passenger name) and viewing all ticket holders. Priority = High.

4.22.2 Stimulus and Response

Stimulus: The bus company administrator clicks or selects an option / link that will allow him / her to modify ticket information and view all ticket holders.

Response: If the bus company administrator chooses to modify existing ticket information, he / she will be asked once again to fill in the necessary information for the field/s that needs to be edited. If the bus company administrator chooses to view all purchased tickets, the system will return all list will all of the purchased tickets that are grouped according to the date purchased and sorted according to their ticket numbers.

4.22.3 Functional Requirements

REQ-1 User must be logged in and should be bus company administrator type.

REQ-2 Database must be updated all the time.

4.23 Print Seat Layout

4.23.1 Description and Priority

This feature allows the bus company administrator to print the seat layout of a bus that will be used for a particular trip as well as the information of each passenger occupying each seat in the bus. Priority = High.

4.23.2 Stimulus and Response

Stimulus: The bus company administrator selects the trip that he / she wants to print the seat layout.

Response: The system returns a page that contains the layout of the bus together with the name of each passenger printed on his / her assigned seat.

4.23.3 Functional Requirements

REQ-1 User must be logged in and should be of bus company administrator type.

REQ-2 Database must be updated all the time.

4.24 Bus Company Manager

4.24.1 Description and Priority

This feature allows the system administrator to add, edit information or delete bus companies. Priority = Medium.

4.24.2 Stimulus and Response

Stimulus: The system administrator chooses whether to add, edit or delete bus companies that are registered in the database.

Response: If the system administrator chooses to add new bus companies to the database, the system administrator is asked to provide the necessary information that corresponds to the new bus companies (name, date established, etc). Else if the system administrator chooses to edit existing information regarding the bus companies, the bus company administrator will be asked once again to fill in the necessary information for the field to be edited. If the delete option is chosen by the system administrator, he / she is asked to choose which bus companies to delete. All changes made will be reflected in the database.

4.24.3 Functional Requirements

REQ-1 User must be logged in and should be of system administrator type.

REQ-2 Database must be updated all the time.

4.25 Create / Delete Bus Company Administrator

4.25.1 Description and Priority

This feature allows the system administrator to create new bus company administrators or delete existing ones. Priority = Medium.

4.25.2 Stimulus and Response

Stimulus: The system administrator chooses whether to create or delete bus company admistrator/s.

Response: If the system administrator chooses to add or create new bus company administrators, the system administrator is asked to provide the necessary information that corresponds to the new bus company administrator (name, temporary username, temporary password, etc). If the delete option is chosen by the system administrator, he / she is asked to choose which bus company administrators to delete and the chosen bus administrators will have their privileges revoked. All changes made will be reflected in the database.

4.25.3 Functional Requirements

REQ-1 User must be logged in and should be of system administrator type.

REQ-2 Database must be updated all the time.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

PR-1: The system is expected to handle about 50 concurrent users at peak usage time of 8:00am up to 5:00pm with an estimated average session of 5 minutes.

PR-2: The server is fast enough to handle request in real time provided that the internet resource of the server is stable and under normal conditions.

5.2 Safety Requirements

No safety requirements have been identified.

5.3 Security Requirements

SE–1: All network transactions that involve personally identifiable information shall be encrypted.

SE–2: The system must ensure that the right to privacy and other stockholders of the system are observed.

SE–3: The system must ensure that user inputs are valid.

SE–4: The system must able to provide error catching mechanisms for “unexpected” user or system behavior.

SE–5: The system shall allow a registered user to have control over its own private information.

5.4 Software Quality Attributes

SQ-1: Usability - the user interface must have a solid flow and every field will have a dropdown list box if its domain can be identified beforehand.

SQ-2: Modularity - in order for the system to be easily maintained, it will be built in a way such that changing an implementation in one part will not cause a mess up in the system but rather change the exact feature intended to be changed.

SQ-3: Correctness – computations made by the system should be accurate

SQ-4: Interoperability – system can be accessed using any popular web browsers.

SQ-5: Robustness – system must handle abnormal and erroneous inputs and other operational conditions.

SQ-6: Scalability – system must be able to accommodate a maximum of 100 users logged on and performing all types of transactions.

5.5 Business Rules

BR – 1 Guests can also book trips.

BR – 2 Bus companies choose the admin.

BR – 3 Super Admin controls which bus companies should use the system.

BR – 4 Super Admin gives the bus company admin an access to the system.

BR – 4 Admin monitors the user log activities.
BR – 5 Admin has the ability to void a transaction if the ticket is still unpaid.

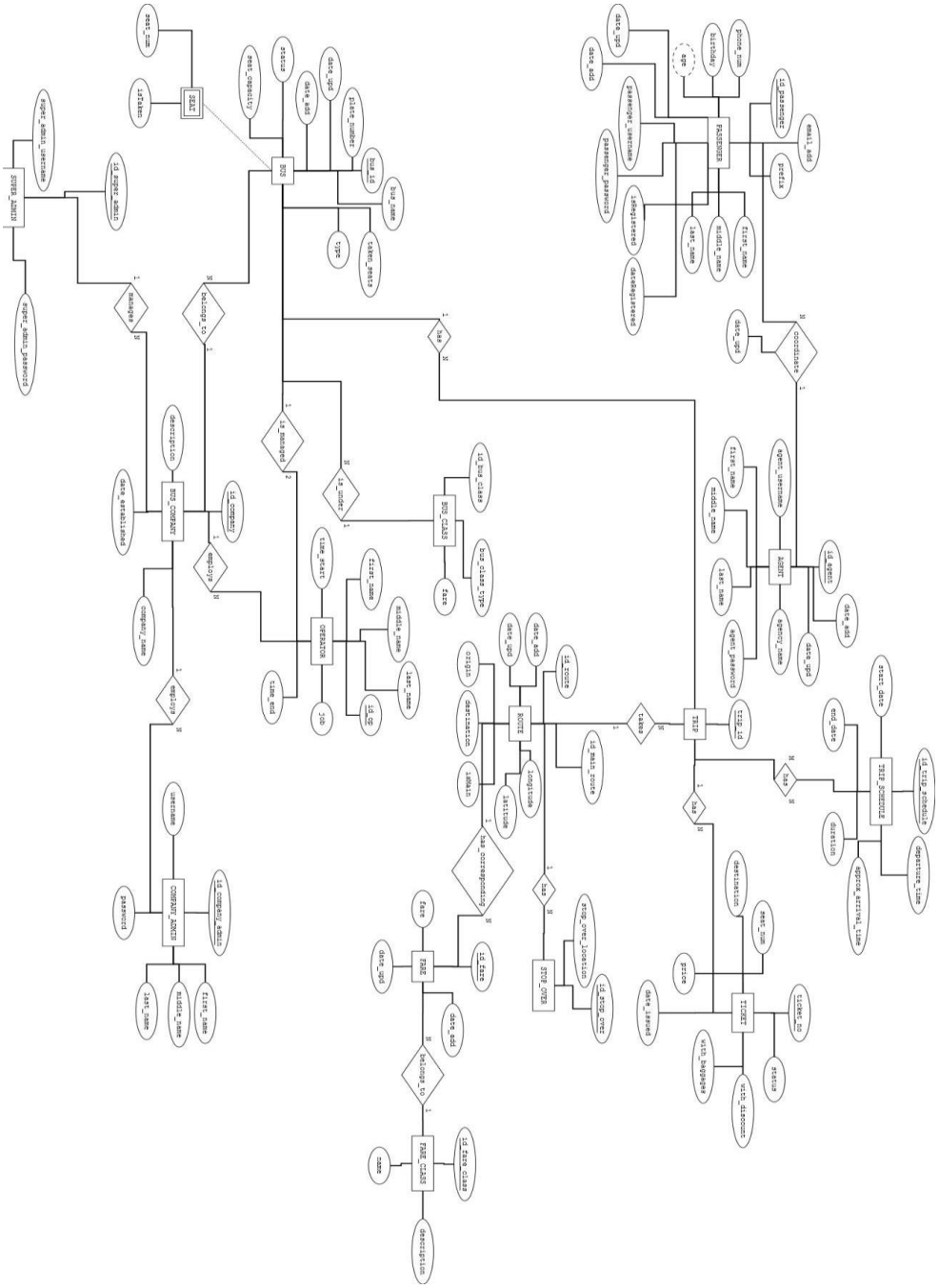
6. Other Requirements

Appendix A: Glossary

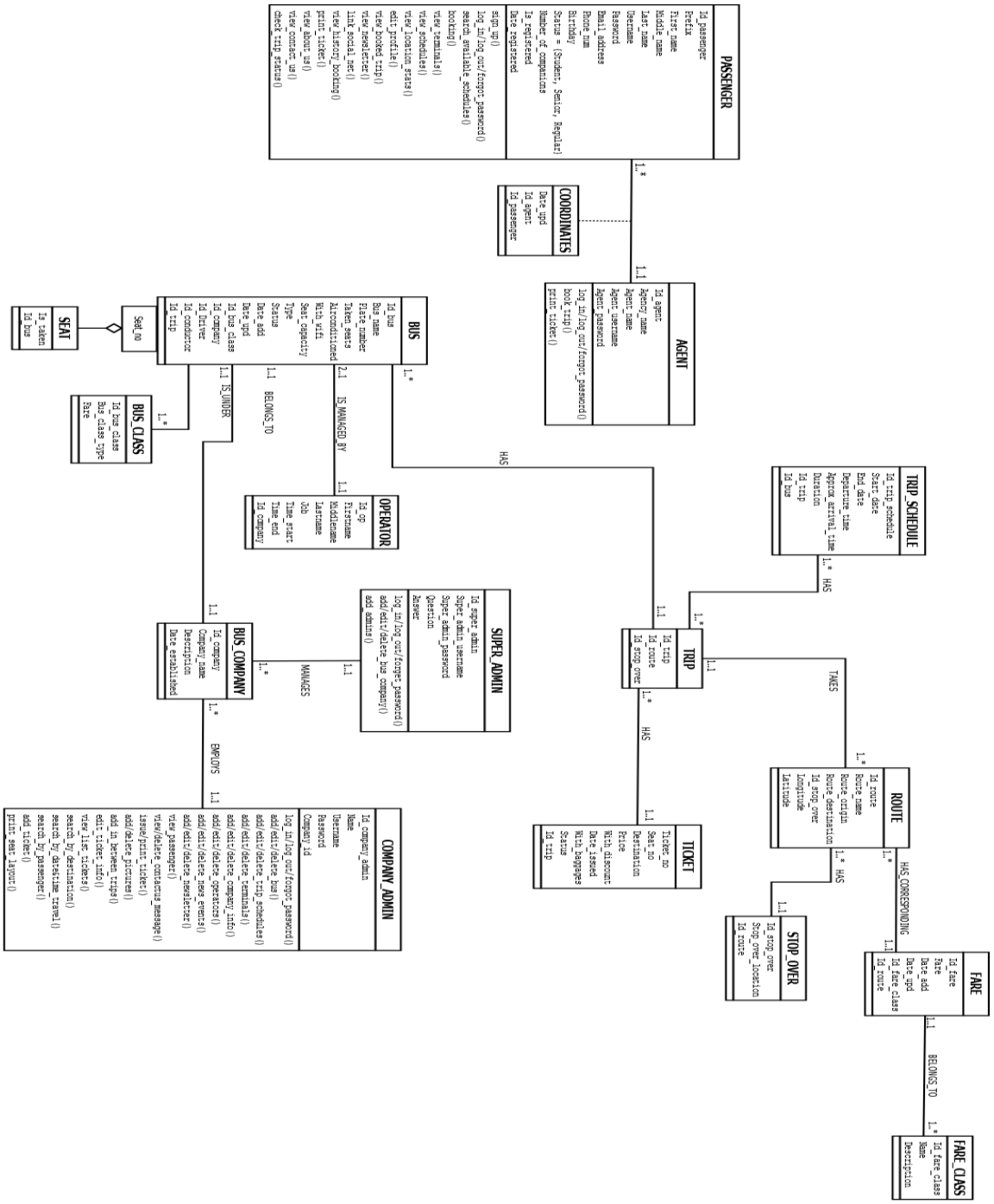
Activity Diagram	A UML diagram that shows the procedural flow of between two or more class objects while processing an activity.
Actors	Human beings who will interact with the system.
Class Diagram	A UML diagram that shows how the different entities (people, things and data) relate to each other; shows the static structure of the system.
ERD	**Entity-Relationship Diagram.** Illustrates the logical structure of databases.
HTML5	**Hypertext Mark Up Language.** A markup language for presenting content of the world wide web. HTML5 is the new standard for HTML.
md5	**Message Digest algorithm 5**. An encryption algorithm that represents a “fingerprint” of a data .
Sequence Diagram	A UML diagram that shows a detailed flow for a specific use case.
Use Case	Illustrates a unit of functionality provided by the system.
Use Case Diagram	A UML diagram that helps development teams to visualize the functional requirements of a system, including the relationship of actors to essential processes, as well as the relationships among different use cases.

Appendix B: Analysis Models

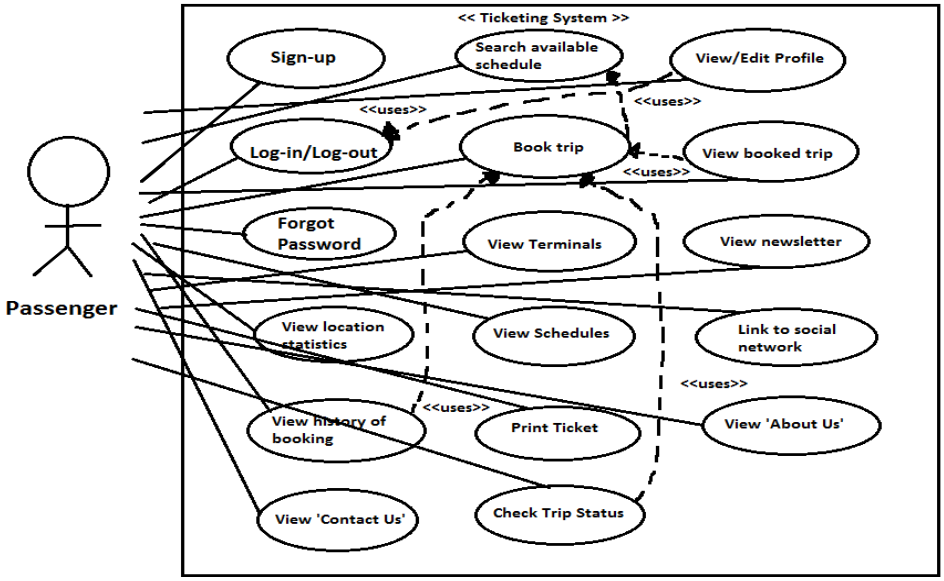
B-1. **Entity Relationship Diagram**

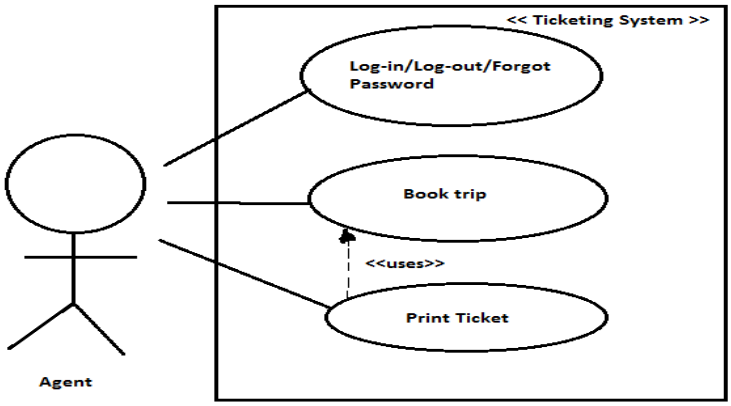


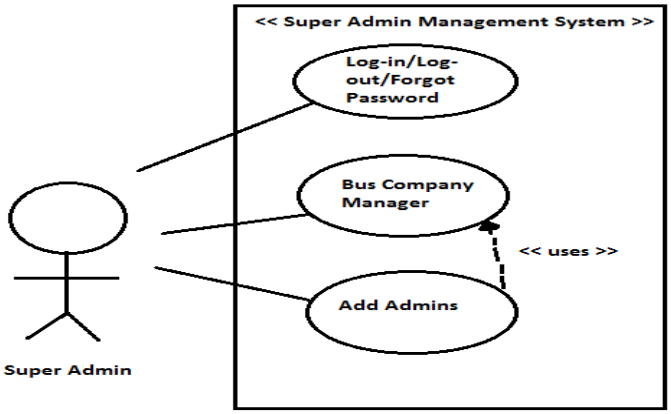
B-2. **Class Diagram**

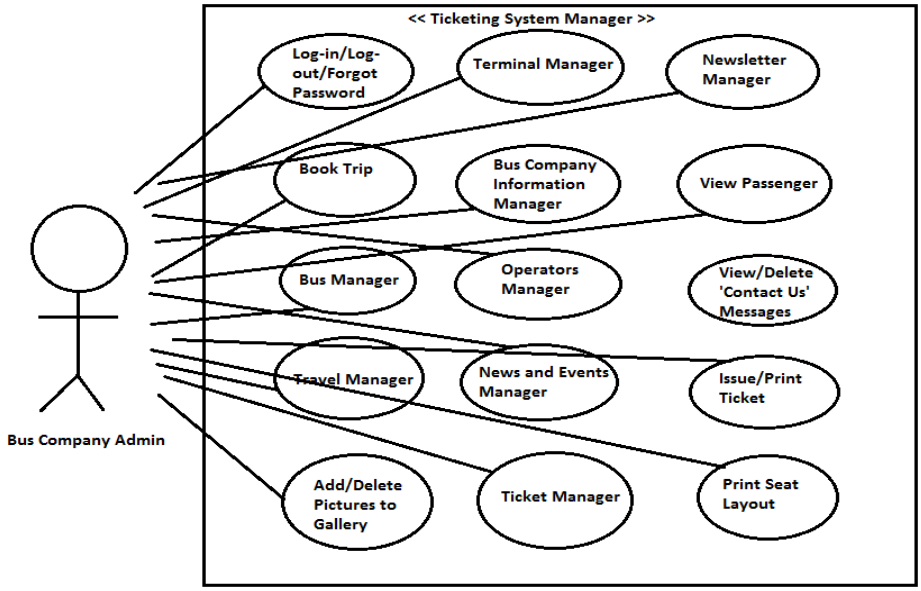


B-3. **Use Case Diagram**

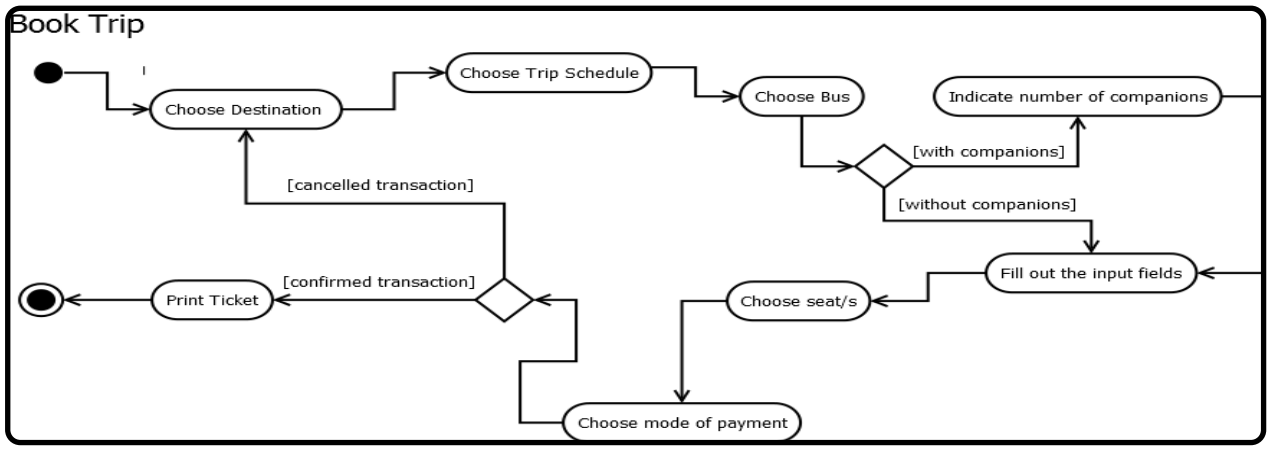


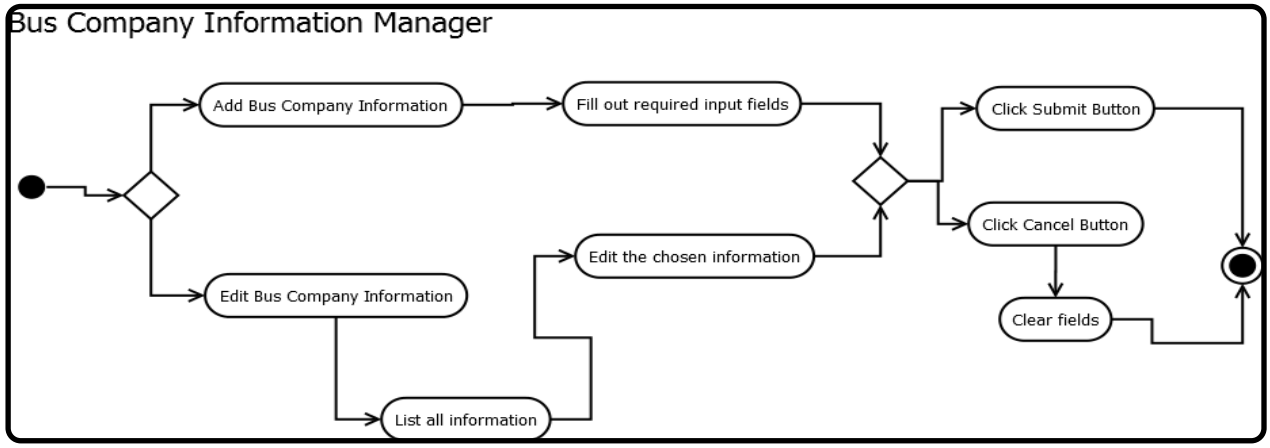


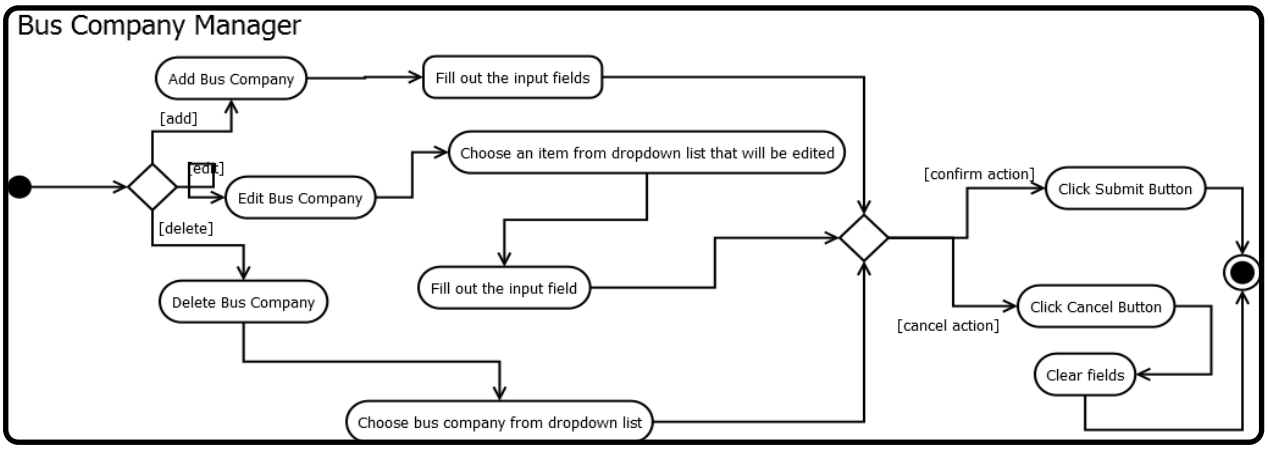

<< Super Admin Management System >>
Log-in/Log-out/Forgot Password
Bus Company Manager
<< uses >>
Add Admins
Super Admin

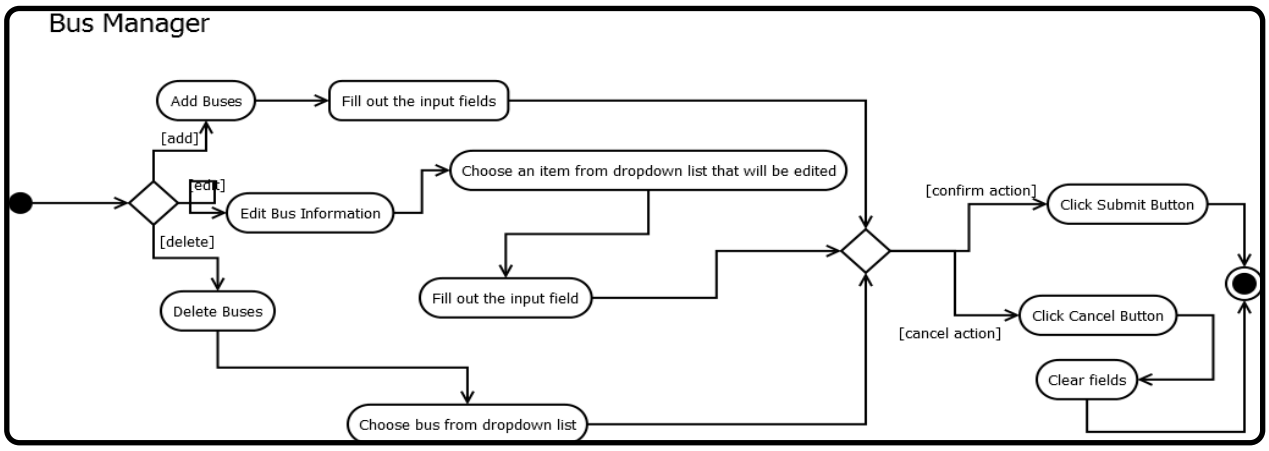

<< Ticketing System Manager >>
Log-in/Log-out/Forgot Password
Terminal Manager
Newsletter Manager
Book Trip
Bus Company Information Manager
View Passenger
Bus Manager
Operators Manager
View/Delete 'Contact Us' Messages
Travel Manager
News and Events Manager
Issue/Print Ticket
Add/Delete Pictures to Gallery
Ticket Manager
Print Seat Layout
Bus Company Admin

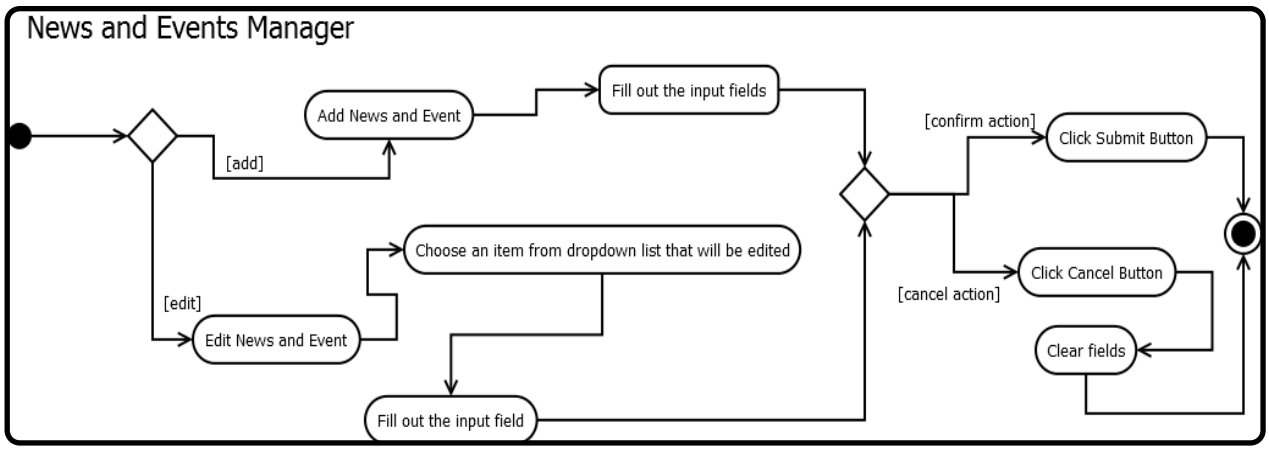
B-4. **Activity Diagrams**

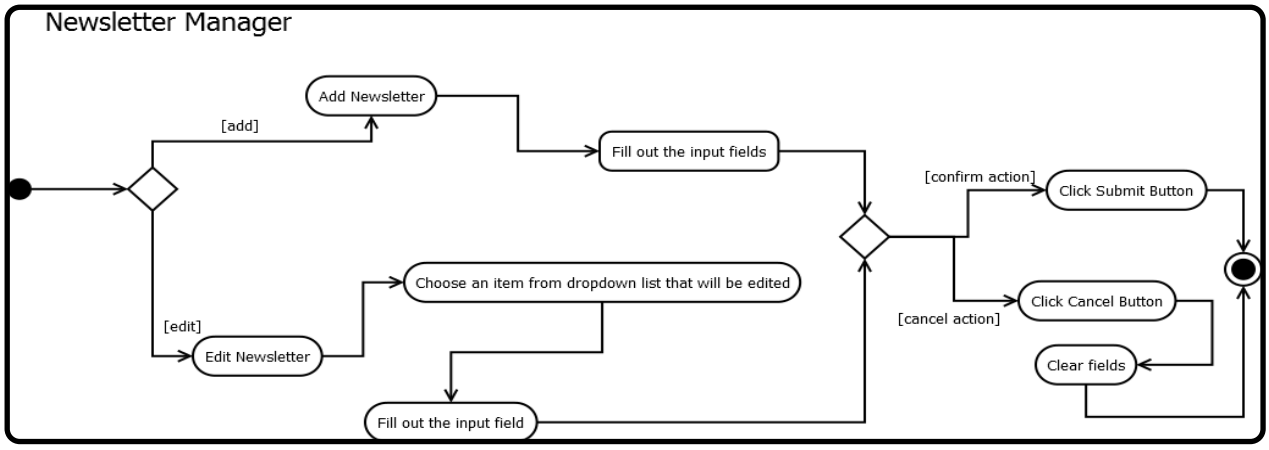


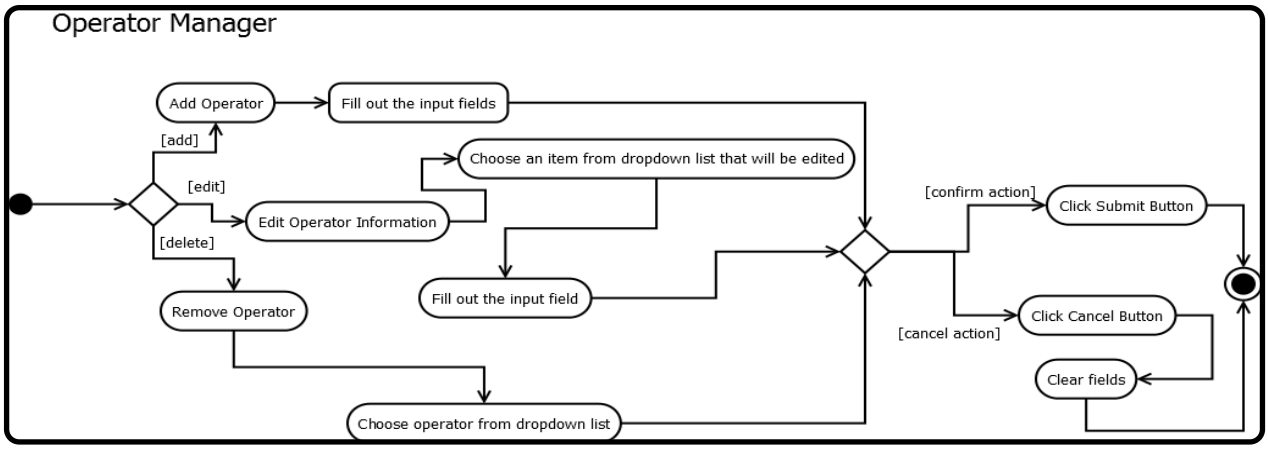


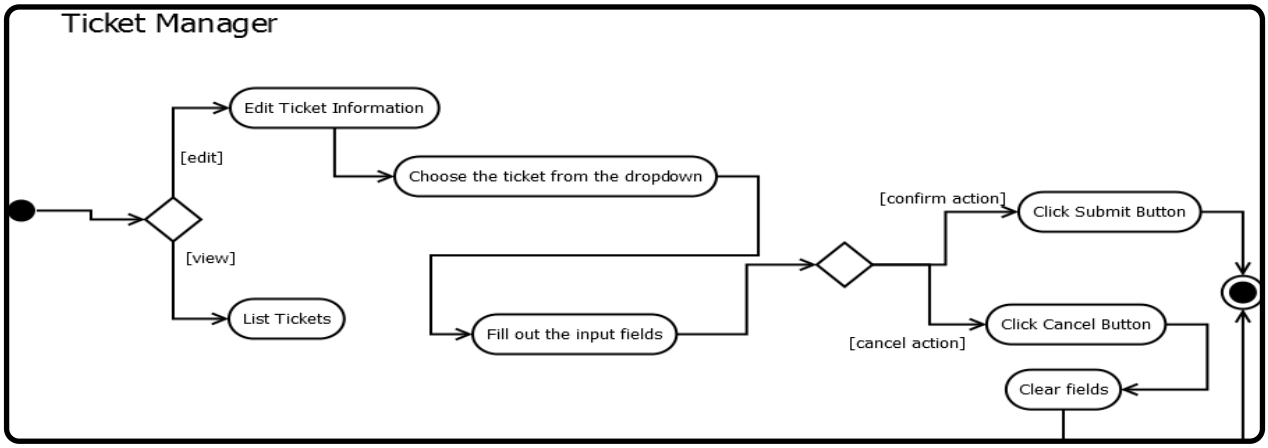


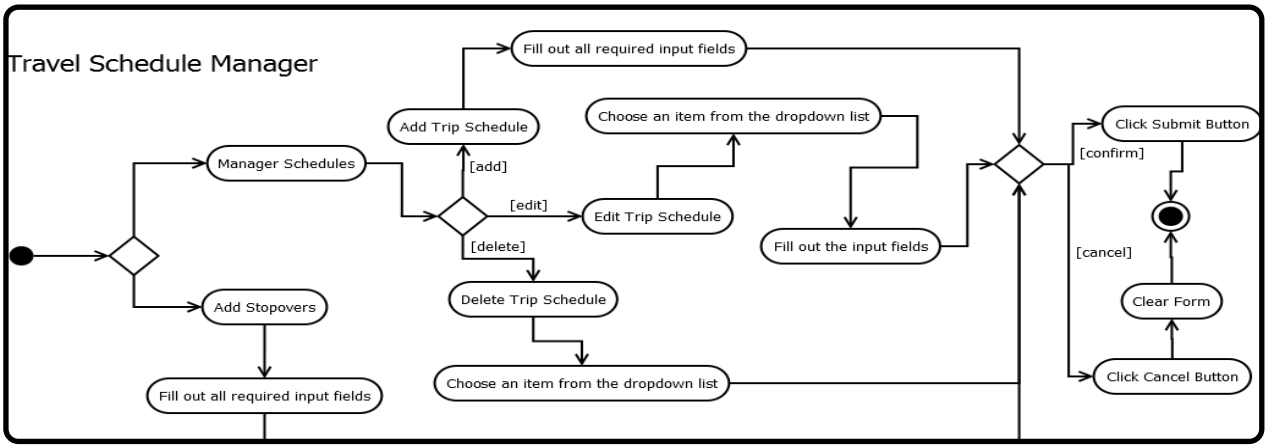

Bus Manager
Add Buses
Fill out the input fields
[add]
[edit]
Edit Bus Information
Choose an item from dropdown list that will be edited
[delete]
Delete Buses
Fill out the input field
Choose bus from dropdown list
[confirm action]
Click Submit Button
[cancel action]
Click Cancel Button
Clear fields


News and Events Manager
Add News and Event
Fill out the input fields
[add]
[edit]
Edit News and Event
Choose an item from dropdown list that will be edited
Fill out the input field
[confirm action]
Click Submit Button
[cancel action]
Click Cancel Button
Clear fields

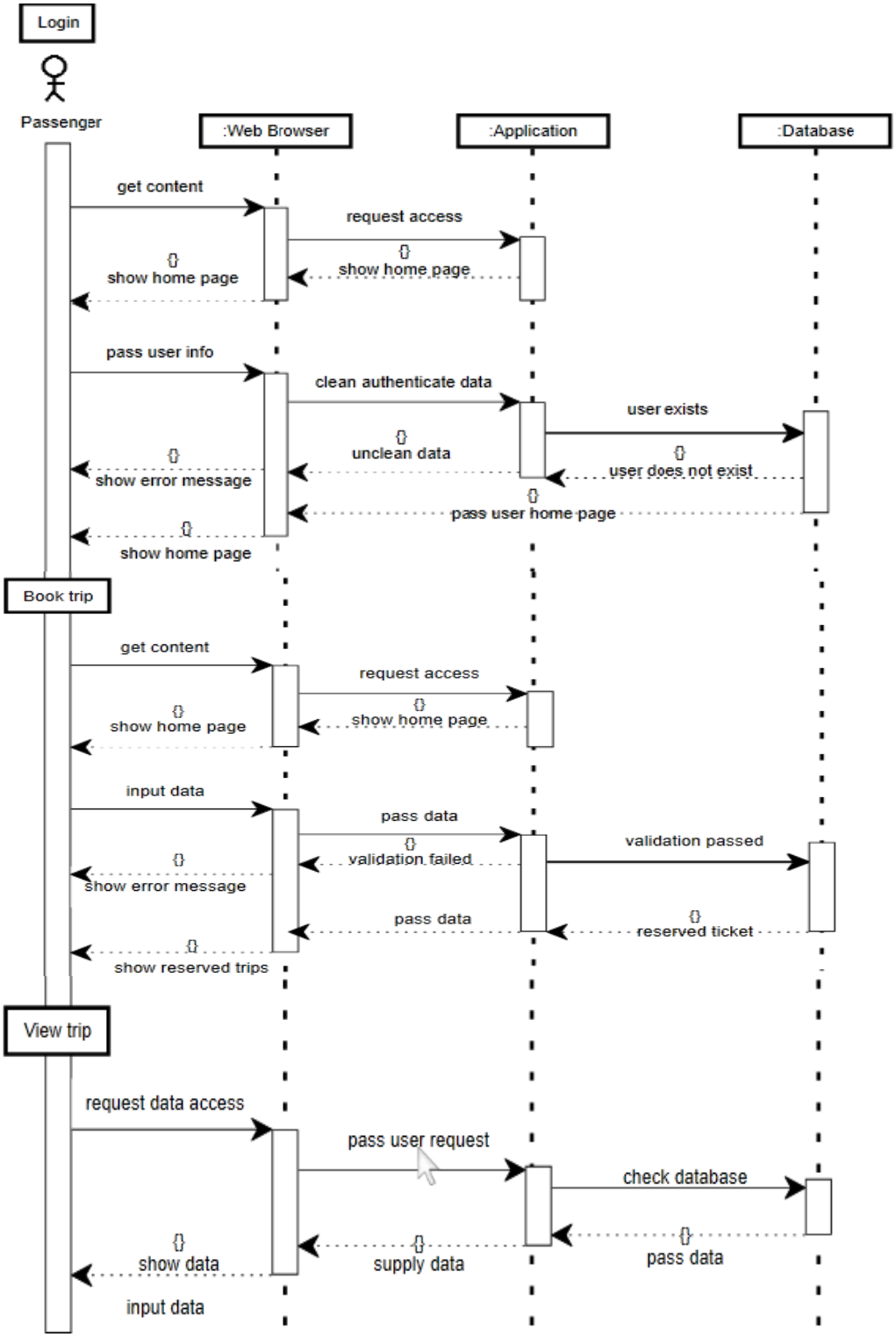

Newsletter Manager
Add Newsletter
[add]
Fill out the input fields
[edit]
Edit Newsletter
Choose an item from dropdown list that will be edited
Fill out the input field
[confirm action]
Click Submit Button
[cancel action]
Click Cancel Button
Clear fields

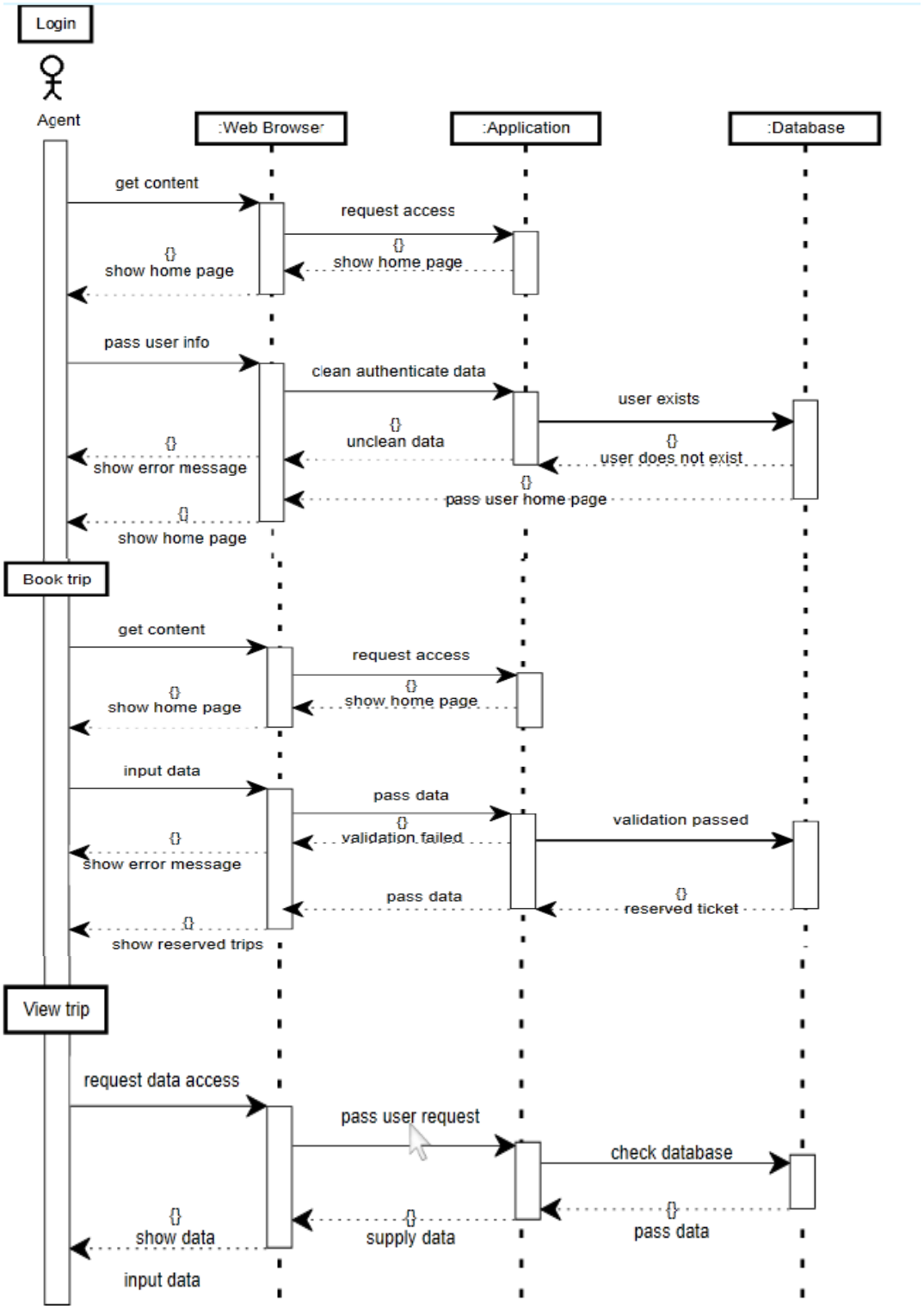

Operator Manager
Add Operator
Fill out the input fields
[add]
[edit]
[delete]
Choose an item from dropdown list that will be edited
Edit Operator Information
Remove Operator
Fill out the input field
Choose operator from dropdown list
[confirm action]
Click Submit Button
[cancel action]
Click Cancel Button
Clear fields

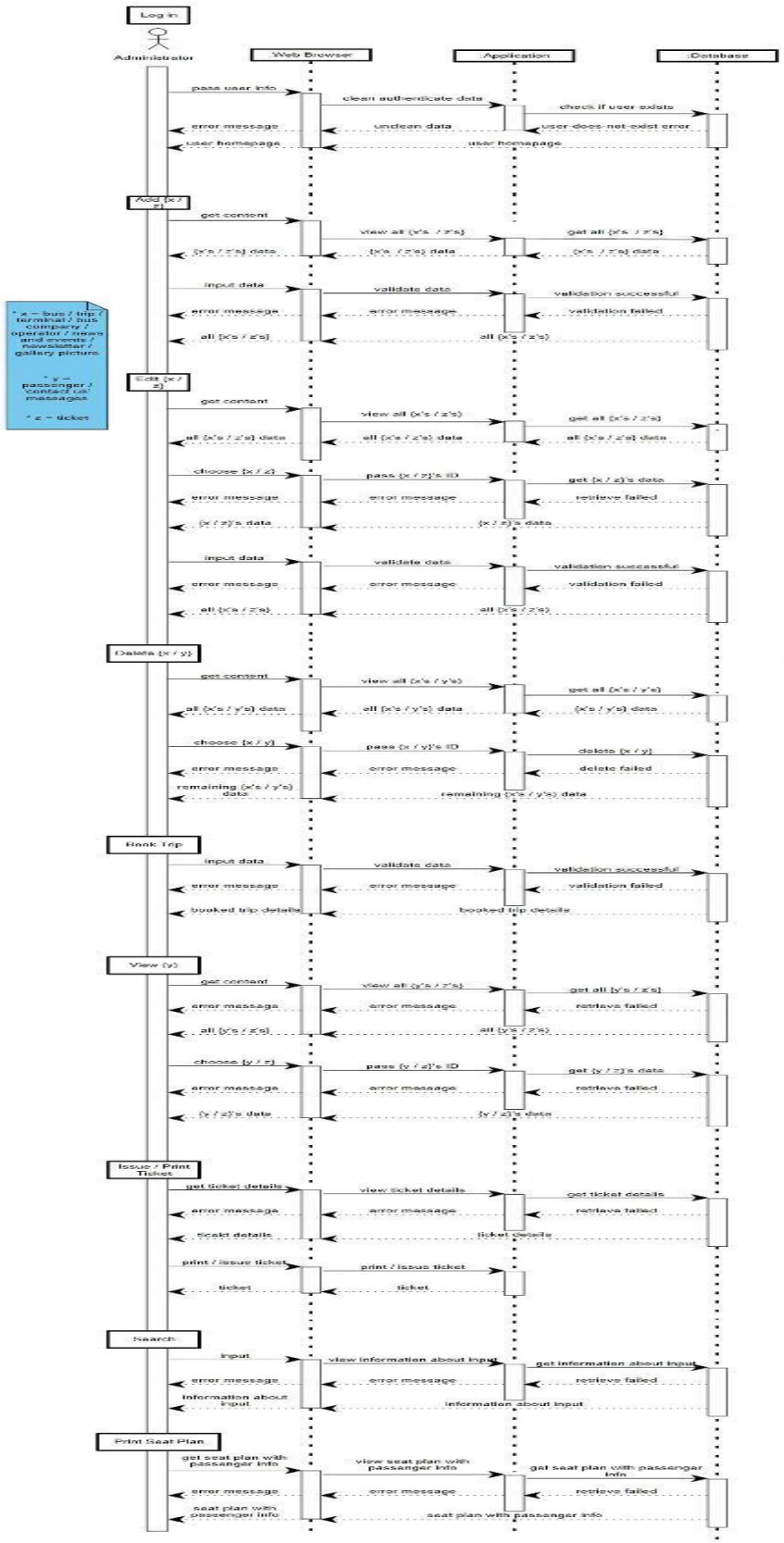

Ticket Manager
Edit Ticket Information
[edit]
Choose the ticket from the dropdown
[view]
List Tickets
Fill out the input fields
[confirm action]
Click Submit Button
[cancel action]
Click Cancel Button
Clear fields

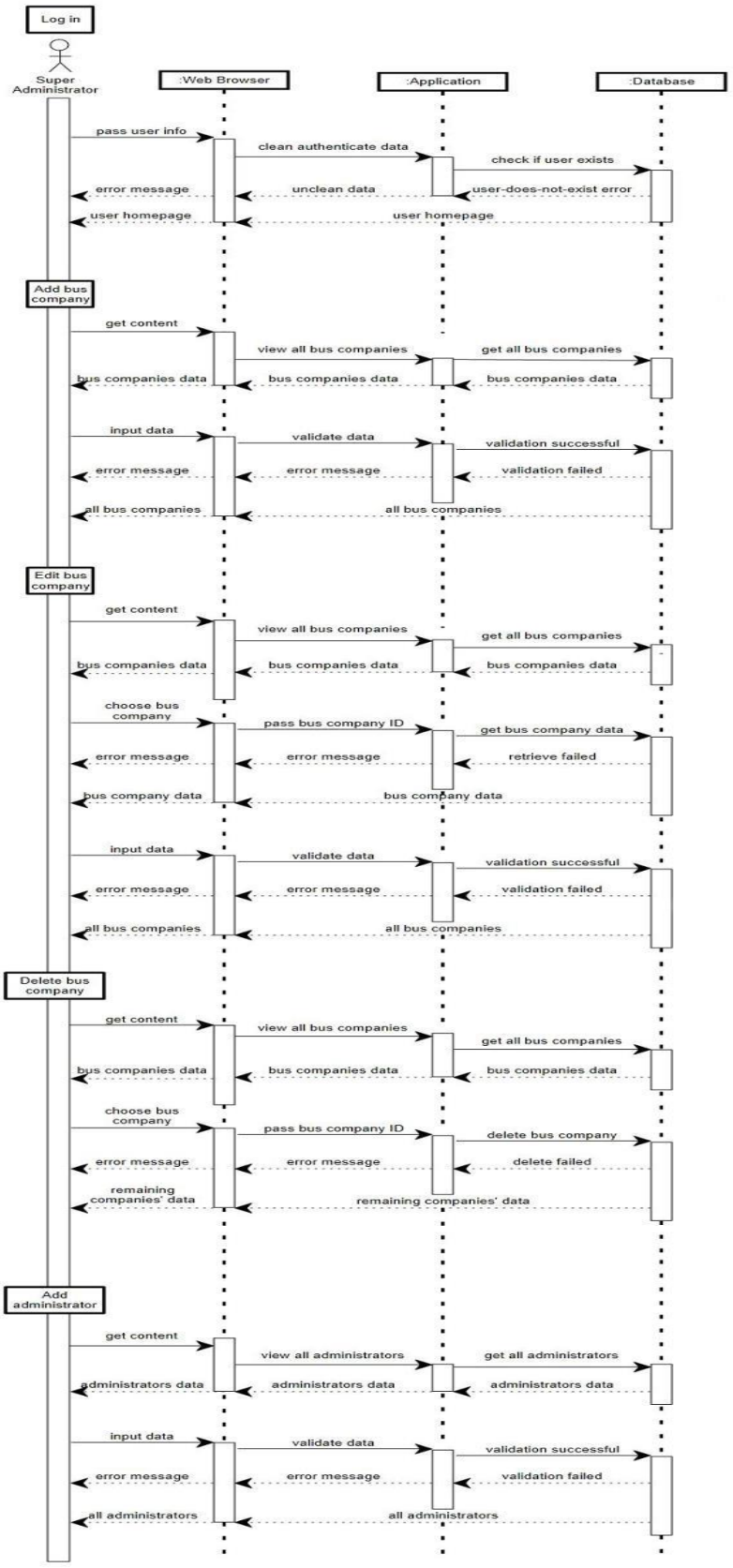

Travel Schedule Manager
Fill out all required input fields
Add Trip Schedule
Choose an item from the dropdown list
Manager Schedules
[add]
[edit]
Edit Trip Schedule
[delete]
Fill out the input fields
Click Submit Button
[confirm]
[cancel]
Add Stopovers
Delete Trip Schedule
Clear Form
Fill out all required input fields
Choose an item from the dropdown list
Click Cancel Button

B-5. **Use Case Diagrams**




Login
Agent
:Web Browser
:Application
:Database
get content
request access
{}
show home page
{}
show home page
pass user info
clean authenticate data
user exists
{}
unclean data
{}
user does not exist
{}
show error message
{}
pass user home page
{}
show home page
Book trip
get content
request access
{}
show home page
{}
show home page
input data
pass data
{}
validation failed
validation passed
{}
show error message
pass data
{}
reserved ticket
{}
show reserved trips
View trip
request data access
pass user request
check database
{}
show data
{}
supply data
{}
pass data
input data


Log in
Administrator
:Web Browser
:Application
:Database
pass user info
clean authenticate data
check if user exists
error message
unclean data
user does not exist error
user homepage
user homepage
Add (x / z)
get content
view all (x's / z's)
get all (x's / z's)
(x's / z's) data
(x's / z's) data
(x's / z's) data
input data
validate data
validation successful
error message
error message
validation failed
all (x's / z's)
all (x's / z's)
* x – bus / trip / terminal / bus company / operator / news and events / newsletter / gallery picture
* y – passenger / contact us' messages
* z – ticket
Edit (x / z)
get content
view all (x's / z's)
get all (x's / z's)
all (x's / z's) data
all (x's / z's) data
all (x's / z's) data
choose (x / z)
pass (x / z)'s ID
get (x / z)'s data
error message
error message
retrieve failed
(x / z)'s data
(x / z)'s data
input data
validate data
validation successful
error message
error message
validation failed
all (x's / z's)
all (x's / z's)
Delete (x / y)
get content
view all (x's / y's)
get all (x's / y's)
all (x's / y's) data
all (x's / y's) data
(x's / y's) data
choose (x / y)
pass (x / y)'s ID
delete (x / y)
error message
error message
delete failed
remaining (x's / y's) data
remaining (x's / y's) data
Book Trip
input data
validate data
validation successful
error message
error message
validation failed
booked trip details
booked trip details
View (y)
get content
view all (y's / z's)
get all (y's / z's)
error message
error message
retrieve failed
all (y's / z's)
all (y's / z's)
choose (y / z)
pass (y / z)'s ID
get (y / z)'s data
error message
error message
retrieve failed
(y / z)'s data
(y / z)'s data
Issue / Print Ticket
get ticket details
view ticket details
get ticket details
error message
error message
retrieve failed
ticekt details
ticket details
print / issue ticket
print / issue ticket
ticket
ticket
Search
input
view information about input
get information about input
error message
error message
retrieve failed
information about input
information about input
Print Seat Plan
get seat plan with passanger info
view seat plan with passanger info
get seat plan with passengar info
error message
error message
retrieve failed
seat plan with passenger info
seat plan with passangar info


Log in
Super Administrator
:Web Browser
:Application
:Database
pass user info
clean authenticate data
check if user exists
error message
unclean data
user-does-not-exist error
user homepage
user homepage
Add bus company
get content
view all bus companies
get all bus companies
bus companies data
bus companies data
bus companies data
input data
validate data
validation successful
error message
error message
validation failed
all bus companies
all bus companies
Edit bus company
get content
view all bus companies
get all bus companies
bus companies data
bus companies data
bus companies data
choose bus company
pass bus company ID
get bus company data
error message
error message
retrieve failed
bus company data
bus company data
input data
validate data
validation successful
error message
error message
validation failed
all bus companies
all bus companies
Delete bus company
get content
view all bus companies
get all bus companies
bus companies data
bus companies data
bus companies data
choose bus company
pass bus company ID
delete bus company
error message
error message
delete failed
remaining companies' data
remaining companies' data
Add administrator
get content
view all administrators
get all administrators
administrators data
administrators data
administrators data
input data
validate data
validation successful
error message
error message
validation failed
all administrators
all administrators