Transportation Management System for Hashemite University Students

Faculty of Prince Al-Hussein Bin Abdallah II for Information Technology

The Hashemite University

Presented to:
Dr. Maen Mohammed Mustafa Hammad

Prepared by:
Mahmoud Ibrahim Mahmoud Abu Aqel
1936150

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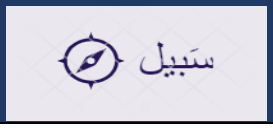


1. Preface:

This project is about introducing a transportation management system (TMS) in Arabic and English languages to the Hashemite University (HU), to organize the relationship between students, employees, and bus drivers.

Project:

- Mobile Application (Sabeel)

2. Introduction:

The transportation problem is considered one of the biggest challenges and obstacles facing the Administration of the HU and its students. The cause of the problem lies in the impractical system of public buses, where bus lines overlap, and the quality of service component is absent, the lack of buses and its frequent breakdowns; also, some drivers do not adhere to legal speeds which become a threat to the safety of students, in addition to their delay in their morning lectures. All these mentioned reasons explained the suffering of more than 30,000 students at the Hashemite University who face great difficulty with transportation in a daily basis. Therefore, the HU decided to solve this problem once and for all.

The transportation department in the HU (i.e. Hakaya) has many buses that run into different routes within and outside the city of Zarqa (about 45 minutes' drive of the capital Amman) to carry students and employees between their homes and the university during different times of the day from all the different Governorates in Jordan. The service will provide struggle-free transport facilities to the students and staff by granting them the chance to register with the TMS, allowing them to search for the bus running based on their desired route, bus type and payment method. The application is a supportive tool for the transportation department which will enable it to add, edit, and delete bus passengers, drivers, and routes.

2.1. Purpose:

The purpose of this document is to describe the functionality and specifications of the Mobile Application (Sabeel) which contains the best ways to manage the transportation process from & to the HU, which will serve the drivers, students and all the employees of the university in a practical way.

2.2. Users of System:

- System Administrator
- Drivers
- Students
- University Employees

3. Glossary:

- HU: Hashemite University
- TMS: Transportation Management System
- iOS: iPhone, iPad & iPad touch, operating system manufactured by Apple Co.
- Android: An operating system for most of smart phones.
- GPS: Global Positioning System
- UI: User Interface

4. Functional Requirements:

This section shows the requirements that specify all the functional actions of this application which make it an easy-to-use app, explained as the following:

1. The application will be managed by an administrator(s) who will be responsible for all the functions of the system. The administrator(s) can add, edit, and delete information in the whole database.

2. User categories:
    a. Driver, for bus drivers
    b. Student/Employee, for university students and staff
    c. Admin, for system administrator

3. A driver user will be only allowed to see how many seats are booked in the bus, view maps/routs, check in and out for each trip they make, and check if the confirmation of the ticket is correct or not.

4. A student/employee user will only be allowed to check the buses schedule, check bus stations, select a bus, book seat(s) in a bus, and view maps/routs.

5. The App will allow the users to register into the system using the authentic information which will be verified by the system before confirmation.

5.1 The authentication will be performed based on pre-defined information such as university student ID, employee ID, etc. This is to ensure that outsiders cannot register.

5.2 Students, employees, and drivers can register in the mobile app.

5.3 Once a registration form is submitted by a user, the next step is in pending status until an administrator approves his/her registration.

6. Registered users will be enabled to login to the app.

6.1 The users access the login page, Provide HU id (username) and password.

6.2 Login validity is checked, then the user is shown his/her respective home page.

6.3 If the entered password was not valid, the user shall click forget password button, another page shall appear with enter your email button, then the user shall click send verification code, a verification code shall be sent to your email.

6.4 The user shall type the received verification code on its specified button, and the user shall be moved to a new page with three buttons to be filled, username, password, and retype password, a new password shall be created.

7. The student and staff users will be allowed to book their seats.

7.1 The user will be charged a certain amount depending on the route, time duration, and bus type.

7.2 After the booking, a voucher/receipt will be generated by the app and needs to be submitted by the user to confirm the booking.

8. The administrator will be able to add, edit, and delete details to the trips such as maps, first destination and final destination.

9. The administrator will be able to add, edit, and delete driver's details, and can assign a driver to a bus or a bus to a driver.

10. The administrator will be able to edit details about any registered user.

11. The administrator will be able to assign a bus to a registered route depending on the necessity.

5. Nonfunctional Requirements:

1- The system shall be in both Arabic & English languages, so users can choose their favorite for registration.

2- This system shall prevent loss of the information by users in any case of errors.

3- This system should be easy to use by the drivers, students and employees, as the UI should be intuitive enough so there is no need for training to login, search and view. On the other hand, admin who is responsible for all the functions of the system, must be familiar with the format of the system and the data entry, and this is may require a minimal training.

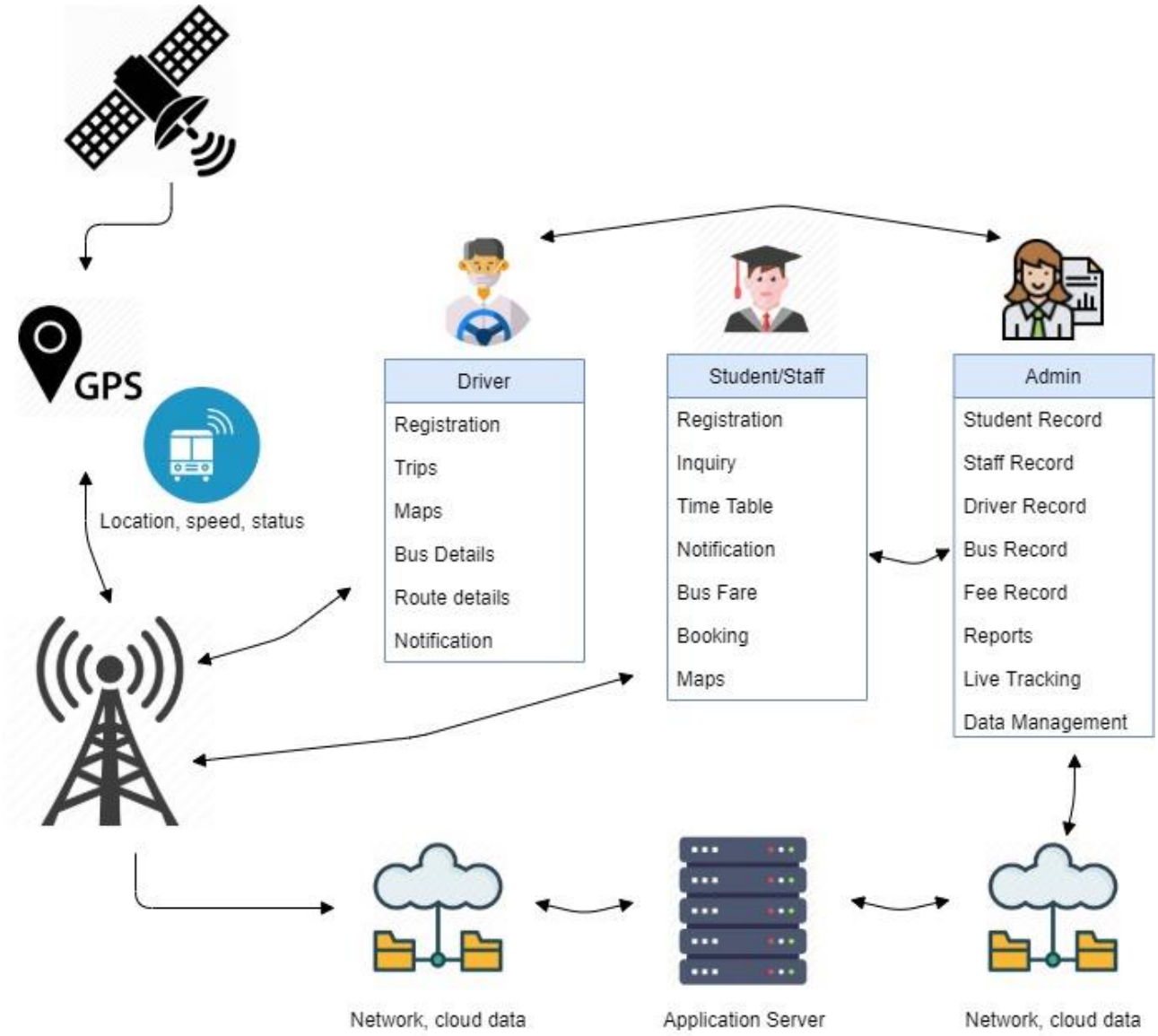
6. System Architecture:

The system is designed to have three key components;

- Application server,
- Global Positioning System (GPS) tracking unit,
- Users:
    - Admin
    - Student/Staff
    - Driver

The application enables users to track the movement of the bus and search for relevant data stored in the database about the trip, bus, and driver. The application allows Admin users to update the database and send notifications to users. The application will be operating in iOS & Android operating systems.

Figure 1: below shows an overview of the system architecture. The tracking side of the system consists of automatic-based GPS bus location and sends the geographical coordinates to the server.



Use case Diagram:

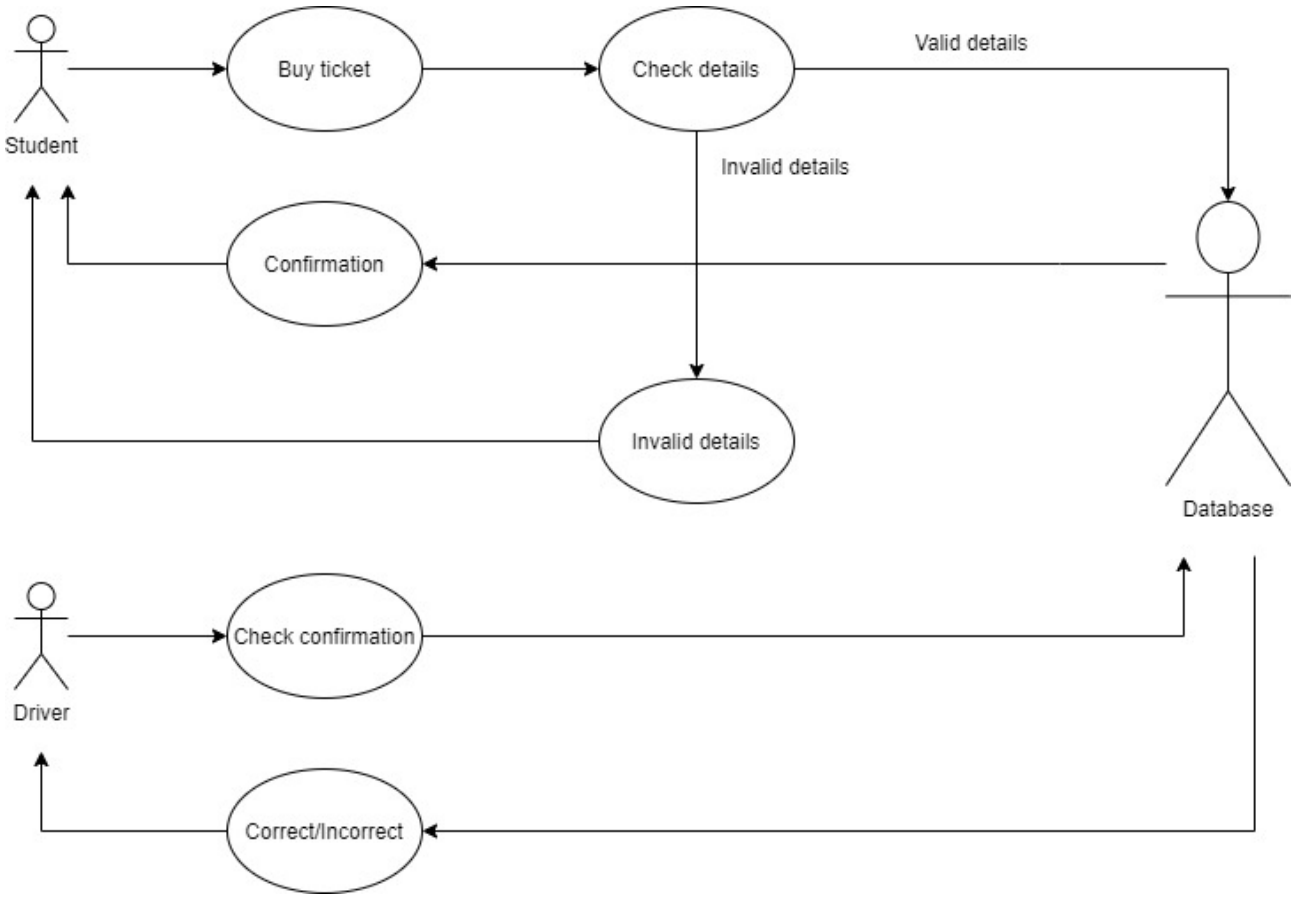


Figure 2: Use case example; buying a ticket

Figure 3: Use case example 2; Below shows the relationship between the student, employee and the bus driver in Sabeel Application.