Project

School Bus Monitoring and Management System[1]

In this project, your team of analysts will work on specifying the requirements and use case model for a new system to be sold to schools in Riyadh to help these schools better monitor and manage their school bus service. The aim is to improve the efficiency of bus transportation and increase the satisfaction of parents.

The School Bus Monitoring and Management System **(SBMS)** is to be deployed on each purchasing school. The **SBMS** consists of a central server connecting several smartphones carried out by bus drivers and students' parents. An administrative user (admin) from the school can add bus drivers, parents, and buses. A bus driver can check-in and check-out students and can view routes to the students' home locations using his/her smartphone. A parent can use his/her smartphone to see the current location of the bus carrying his/her child.

The admin uses a web access interface (a web page) to register bus drivers, parents, and buses. When registering a parent of a student, the admin inputs the home location of the parent's son or daughter by clicking on a map. The **SBMS** will send an SMS to the newly registered parent or bus driver which includes a unique username and password. A parent uses the username/password to access the system via his/her smartphone. This is the same for the bus driver. Parents or bus drivers can change their password.

The admin also registers buses and bus drivers. The admin needs to set the capacity for each bus. A bus capacity is the number of students that the bus can accommodate. The admin assigns bus drivers to buses manually. The system will then send a message to the bus driver to accept or decline the assignment. If the bus driver accepts the assignment, the bus will be assigned successfully to him/her.

In addition, the admin should have full management capabilities (edit and delete) of the bus driver and parent accounts.

A bus driver accesses the system via a smartphone. Beforehand, the bus driver should upload the **SBMS** mobile app (iOS is initially chosen to be the operating system supported by **SBMS**). A bus driver should access the mobile app using his/her correct username and password. The bus driver can view the route computed for his/her bus. In addition, the bus driver should be able to view the location of the bus in real time.

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[1] The general ideas are based on the graduation project titled 'School Bus Monitoring System' which was supervised by Dr. Khaoula Hamdi.

A bus driver delivers his/her assigned students from their homes to school in the morning and vice-versa in the afternoon. When the bus driver picks up a student, the bus driver uses the mobile app to check-in the student. Analogously, when the bus driver delivers a student to his/her home or the school, the bus driver uses the mobile app to check-out the student. The bus driver delivers students in order as outlined by the computed route for his/her bus. The bus driver should be able to view the number of remaining students who still have not been checked out.

A parent uploads the **SBMS** mobile app for parents and accesses the app using his/her correct username and password. A parent should be able to view the location of the bus carrying his/her child in real time and can view the pickup schedules of the week where he can request canceling the advanced scheduled pickup of his/her child.

The mobile apps should be easy to use by parents and bus drivers, the system allows 1000 parents and bus drivers to use the system at the same time. Also, the location of the bus should be accurate and updated continuously in real time.