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Software Engineering (CS- 310)
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Project-Phase No: #1
The Smart School Bus
(software plan document)

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1. Introduction

1.1 Purpose

The application aims mainly to save the time and effort of the bus driver in knowing whether the student will go to school or not? Will it pass on all students or not? What will the driver's journey be like for students who go to school?

This is a good way instead of wasting the bus driver's time and effort by going to each student's home and waiting for the student to leave his home. In the same time, the bus driver does not really know whether the student will go to school or not. Also, the traditional way is wrong because it is a waste of bus gas.

The application mainly targets the primary school stage, whether they are boys or girls. The application can be also used for the middle or high school, whether they are boys or girls.

1.2 Scope

The application consists of three basic elements: the school administration, the bus driver with the supervisor accompanying the driver, and the parent.

Each of these elements has certain capabilities. For the school administration, they can add the data of drivers, supervisors and students connecting them to the school buses.

For the bus driver, he can find out the itinerary for students who will attend school via Google Maps.

As for the supervisor who accompanies the driver, he can access the student's data if there any problem occurs for the student.

For the parent, he can determine whether his son will go to school or not.

1.3 Definitions

Messages sent: Any message sent by the application will be via e-mail.

Notifications: Any user-specific notification will be available in the email. Therefore, the user will have to download one of the applications that allows him to receive any email sent for any notification to reach him immediately.

1.4 Overview

The rest of this document is only two chapters. Chapter Two provides an overview of the functions of system and how it interacts with beneficiary, as well as the constraints of system and device through which the system will be viewed.

Chapter Three provides the specifications of requirements in detailed terms and clear to the customer. It also provides the specifications for the non-functional requirements and conclusion of this system.

2. General Description

2.1 Product Perspective

My Bus Project is a web-based system. The system design is suitable for Smartphones and some tablets, but not suitable for desktop devices. This system is divided into three basic elements. These elements must interact with each other in order for the system to work properly. This system saves time and effort for the bus driver. In addition, it organizes taking the students to and from school. It is possible to give a report to the school administration regarding the attendance and absence of students registered on school buses.

2.2 Product Functions

Initially the school administration must create an account for the application. After that, you should go to its control panel to add the data of the supervisors and the bus drivers. The school will now be ready to receive students to be enrolled on the bus. A parent must create an account for the app to register his son on the school bus. Then he must search for the same application of the school to register his son in, to make a request to the school administration to register his son on the bus. After the school administration approves the request, the student will be connected to one of the buses and the parent will be notified that his son has been registered on the bus.

The parent must specify in the app whether his son will go to school or not. The next day the bus driver will open the application to see the itinerary of students who will go to school. When the bus driver arrives at the student's home, the supervisor accompanying the bus driver will send a message to the parent that his son has left his home and boarded the bus. When the school is over and the student returns to the home, the supervisor will send a message to the parent that his son has been returned to the home.

The school administration can obtain a report regarding the attendance and absence of students registered on school buses.

2.3 User Characteristics

The application is divided into two parts: the parent section and the school section. The school section is divided into two parts: an administrative section which is the school administration and a field section and they are bus drivers and supervisors accompanying the drivers. The only two skills that a parent must possess are not being illiterate and being persistent in determining whether his son will go to school or not through application. The

only skill the supervisor must have is the commitment to send a message through the app to the parent at the time the student leaves and returns home. It does not require any experience from the school administration or the bus driver to use the application.

2.4 General Constraints

The Internet connection is considered one of the basic constraints, since the application works through a browser and because it fetches data from the database and therefore the Internet connection is necessary.

The application targets all academic levels of boys or girls. The university level is excluded because the application capabilities for the university stage, especially for the female students are few and unsuitable, especially when there is no tracking system for the bus. It is inappropriate when the parent receives messages by e-mail, because the parent will have to download an application that allows him to receive any email sent.

Parent geolocation is also a key constraint, in order for the driver to know the location of the student's home and to determine the itinerary of the bus driver.

3. Specific Requirements

3.1 Functional Requirements

3.1.1 Functional Requirement #1

Function: Add students to school buses by the school administration.

Description: The school administration should have a control panel that allows adding the data of drivers, supervisors and students and connecting them to school buses.

Inputs: The data of driver, supervisor and student.

Source: Each of these inputs records its data and then this data goes to the school administration.

Outputs: Connecting the driver, supervisor and student to one of the school buses.

Event: Initially, the school administration must receive the data of driver, supervisor and student to be linked to the school bus. The parent must search in the application for the school where his son is registered, to make a request to the school administration to register his son on the bus. The school administration must add the data of supervisors and bus drivers manually or by sending a registration link for each of them. After the school administration approves of the parent's request, the parent will be connected. And one of the supervisors and drivers will be connected to one of the school buses.

Pre-condition: Both the parent, supervisor and driver have an account in the application.

Post-condition: A notification will be sent to the parent with the bus details in which the son is registered, such as the driver's name, the name of the supervisor, the bus number, etc.

Side Effects: The application will not operate as required if this function is not present.

3.1.2 Functional Requirement #2

Function: Students attendance status.

Description: The parent should have a control panel that allows him to determine whether his son will go to school or not.

Outputs: The bus driver knows whether the student will go to school or not.

Destination: Inside an event function.

Event: Students are taken from their homes based on the parents' determination within the application whether their children will go to school or not. The parent must decide before the expiry date. Establish the limitation period so that the parent does not decide that his son will go to school at a time when the driver is busy taking students to school. The expiry date of the determination decision is determined by the school administration.

Requirements: Function Requirement #1.

Pre-condition: The parent has an account in the app.

Post-condition: Sending the bus driver the itinerary after the end of the date for determining the students going to school.

Side Effects: The application will not operate as required if this function is not present.

3.1.3 Functional Requirement #3

Function: Bus driver's itinerary.

Description: The bus driver has a control panel that allows him to know the itinerary for students who will attend school.

Inputs: The parent determines in the app whether his son will go to school or not.

Source: Via the Parent Control Panel.

Outputs: The bus driver gets the itinerary.

Destination: Inside a conditional function.

Event: When the bus driver is ready to take students, whether from their homes or from school, the application enables the driver to know the itinerary, to take students to the school or to their homes. Instead of the driver logs into the app and deducing the itinerary by himself based on students who will go to school or not, the start of the journey, whether it is going or returning students from the school, will be determined based on the nearest home for bus driver.

Requirements: Function Requirement #2.

Pre-condition: The bus driver has an account in the app.

3.1.4 Functional Requirement #4

Function: The access to the data of student.

Description: The supervisor has a control panel that allows him to access the student's data.

Inputs: The parent has an account in the app.

Source: Through the application.

Outputs: The supervisor can access student data.

Event: Through the control panel of the supervisor, the supervisor can access data related to the student such as the name of the parent and the name of the student and the phone number of the parent regarding any problem related to the student, for example that the door of the student's house does not open at the time of his return from school. So the supervisor must communicate with the parent to solve this problem.

Requirements: Function Requirement #1.

Pre-condition: The supervisor has an account in the app.

3.1.5 Functional Requirement #5

Function: Parent Notice.

Description: A daily notification when the student gets into the bus and returns home.

Inputs: The parent has an account in the app.

Source: Through the application.

Outputs: Sending a message to the parent.

Destination: Inside an event function.

Event: When the driver arrives at each student's home, the supervisor will have to send a message to the parent that his son has left his home going to school. This process is repeated when the driver takes each student back to the home.

Requirements: Function Requirement #2.

Pre-condition: The student must be registered with one of the school buses.

3.1.6 Functional Requirement #6

Function: School Administration Report.

Description: A report regarding the attendance and absence of students enrolled in school buses.

Inputs: The students must be registered in the school buses.

Source: Students are added to buses through the school administration.

Outputs: The school administration obtained a detailed report of students' attendance and absence.

Event: This function depends on the parent. When the parent decides to absent his son for any reason, he will determine within the application that his son will not go to school. At the end of the date, all parents' decisions regarding their sons' attendance will be approved or not. These decisions will be sent to the school administration.

Requirements: Function Requirement #2

Pre-condition: The school administration has an account in the app.

3.2 Non-Functional Requirements

1. The ability of a parent to communicate by phone with the bus administration official in case a problem occurs for the student.
2. The possibility of the supervisor absent any student, it was specified in the application that he will attend but in fact that he did not leave the house, so that the report data for students who attended school for this day are correct.
3. The ability to communicate with the application developer in case of there is any problem or suggestion regarding the application.

4. Conclusion

This document has been explained in such a way that it makes the client or anyone else understand this document from the first time. In the future, additions and amendments will be made for the application to add the university stage with the rest of the academic levels. We will also make the application available on Android and IOS.