



Project Proposal (Synopsis) of

BACHELOR OF COMPUTER APPLICATIONS (BCA)

On

SCHOOL BUS TRACKING SYSTEM

To,

Project Coordinator (BCA)

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SCHOOL BUS TRACKING SYSTEM

TABLE OF CONTENT

	Page No.
1. Introduction 4
2. Objectives6
3. Project Category	....7
4. Platforms/Tools of Project – H/W and S/W	....10
5. Design of Project	
• DFD	....11
• ERD	....16
• Data structure	....17
• No. of Modules and their Description	....19
6. Validation to be Performed	....22
7. Types of Report Generation	....23
8. Limitations of the Project	....24
9. Future Cope of the Project	....25
10. Bibliography	....26

INTRODUCTION

Traditional system:

In the schools there is no way to share location of the students while they are travelling in the bus. There is no safety and security in the traditional system. When the bus is late the parents have to wait for the bus for a long time without knowing how much delay. Attendance is marked in the registers. Parents aren't updated with the location of the bus. Because of safety and security issues people prefer to drop and pickup their kids by their own vehicle.

Proposed System:

The proposed system is the **SCHOOL BUS TRACKING SYSTEM** **which** is the Android App made for any type of SCHOOL to track the location of the school buses and respective students. Parents can keep track of their children while they are travelling to school and while coming back home. The app sends alerts about boarding and deboarding from the bus of their child to the parents. The app is so efficient to ensure the safety and security of the students.

It is created in android studio using Java programming language and MySQL/Firebase server. GPS (Global Positioning System) from driver's mobile phone sends the location data to the parent via the app. The app sends live location of the bus to the parents via internet.

Admin can add or delete students, trips, routes etc. in the Database. There is validation check at beginning using the Phone number and password. Only admin have the authority to alter the details. School has to share the details of the students with the admin in order to add him to the database.

The driver will have the android application installed in his smartphone. When driver sign in GPS location of the driver will be followed naturally by the application and stores the GPS co-ordinates into database after at regular intervals. At the point when driver logs out from the application, again GPS area will be put away. School bus tracking system relies on the WATERFALL MODEL.

OBJECTIVES OF THE PROJECT

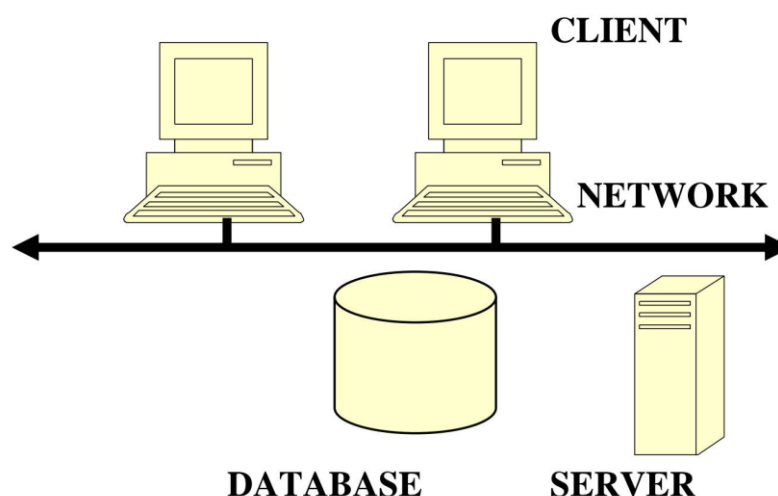
- Provide Android app to **TRACK LIVE LOCATION** of the **SCHOOL BUS**.
- This provides a good graphical interface/environment through which an easy and interactive communication can be made regarding bus location.
- The system allows updating the details of Students, Routes, Driver, Trips, Initial and final location etc.
- Ensure Safety and Security of the students while transiting.

PROJECT CATEGORY

CLIENT SERVER ARCHITECTURE

In Client Server Architecture data management and transaction processing functions can be performed independent of the client applications and user interfaces.

In client server architecture the front-end (Client) and the back-end (server) are connected by a network. The front-end deals with the user interface and the back-end executed SQL statements and deals with database management. The data is transmitted through the network in a tabular form called the TDS (Tabular Data Stream). The major advantage of Client/Server architecture is that the server is available for a number of clients and, there is a distribution of work between the client and the server. The user directs the request to the client (front-end) the client in turn understands the users request and redirects the request to the server. The server retrieves the data, gives it to the client and any future manipulation is done by the client on the basis of the user's request.



- The Project is based on **Three Tier Architecture**.
The three tier architecture where the application is divided into three logical constituents

- User Interface – Provide services such as user interface. (Android SDK)
- Business Services – Implement business rules
- Data Services – Provide handling and validation of data. (MS SQL Server/Firebase in this case)

Disadvantage of the two tier architecture

- It puts extra load on the server.
 - It increases the network traffic.
 - Difficult to implement incremental improvements.
 - Application is bound to the data source.
-
- It will be build using JAVA and SQL server/Firebase on Windows 7 Platform.

Reasons for using JAVA

- Java is Object-Oriented. This allows you to create modular programs and reusable code.
- Java is platform-independent. Java has ability to move easily from one computer system to another. The ability to run the same program on many different systems.

Because of Java's robustness, ease of use, cross-platform capabilities and security features, it has become a language of choice for providing worldwide Internet solutions.

RDBMS have the following facilities

- Creations of files, Addition of data, Deletion of data, Modification of data.
- Retrieving data collectively or selectively.
- The data stored can be sorted or indexed at user's discretion or direction.
- Various reports can be produced from the system. These may either be standardized reports or that may be specifically generated according to specific user definition.
- Mathematical function can be performed and the data stored in the database can be manipulated with functions to perform the desired calculations.
- To maintain data integrity and database use.
- Data integrity for multiple users.
- Providing form based interface for easy accessibility and data entry.

TOOLS/PLATFORM, HARDWARE AND SOFTWARE REQUIREMENT SPECIFICATION

Tools/Platform

Project is developed using **JAVA** in **ANDROID STUDIO** as Front-end & **MS SQL/FIREBASE** for storing data as backend.

Hardware Requirement Specification

Altogether a Mobile Phone with following components:

- ☐ Qualcomm Snapdragon processor
- ☐ 2 GB RAM
- ☐ Internal Storage 8 GB
- ☐ GPS enabled(Global Positioning System)
- ☐ Internet
- ☐ Android 4.1 or Higher

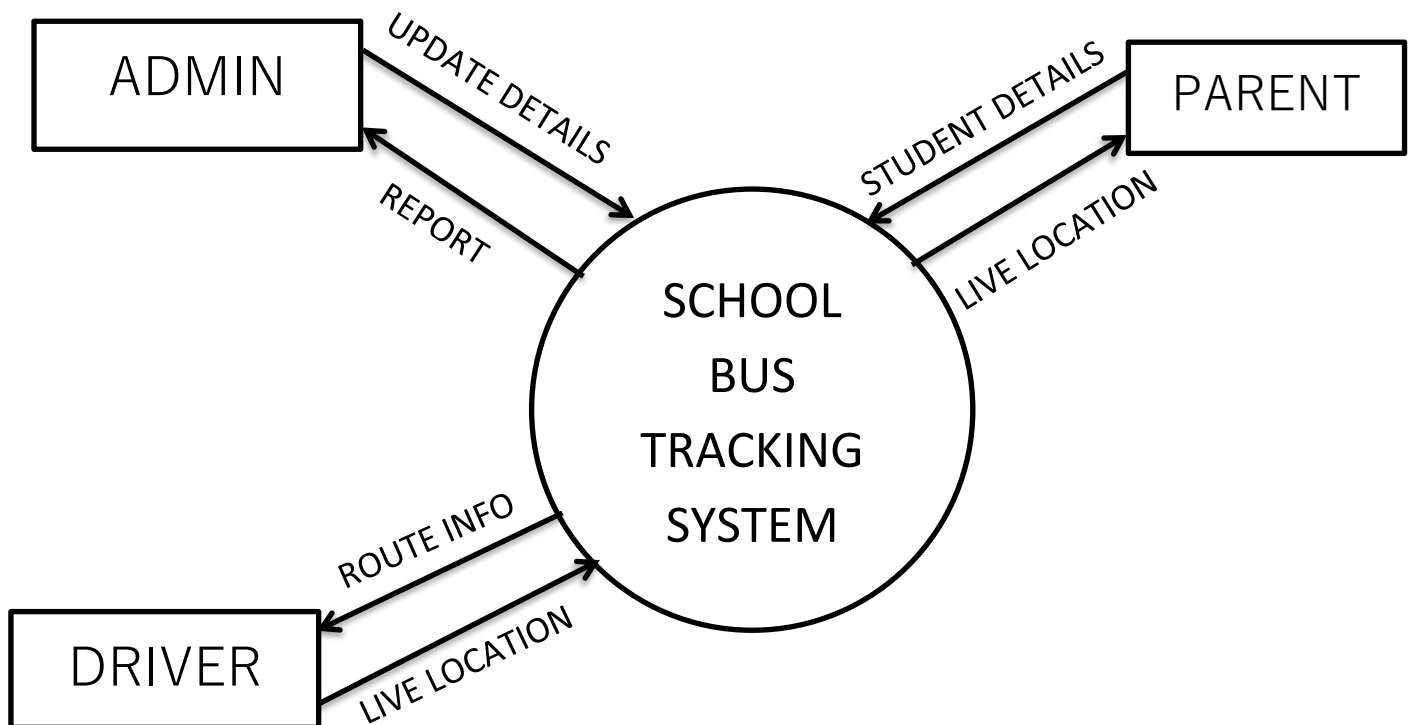
Software Requirement Specification

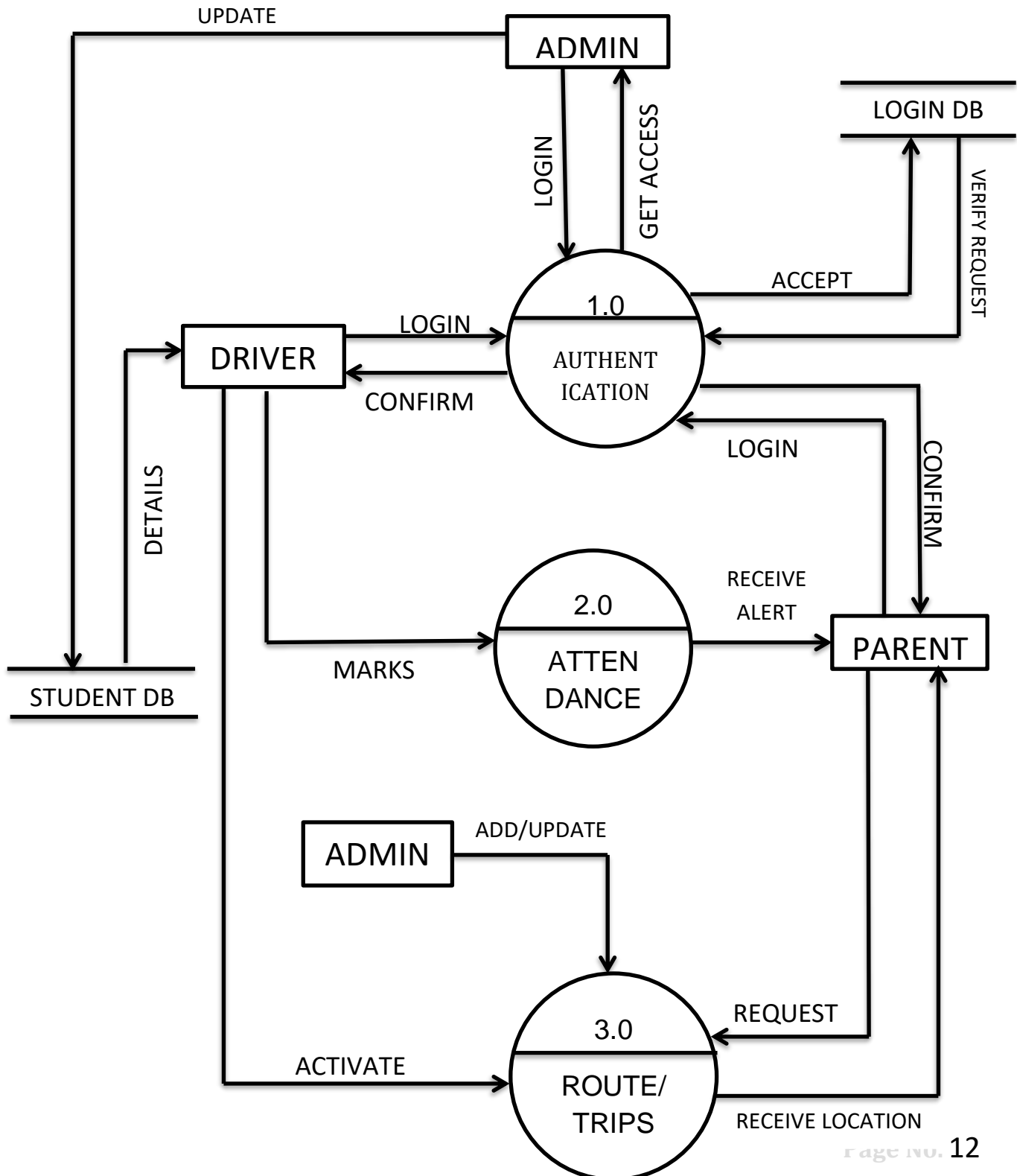
The software which are required for developing the application are as below:

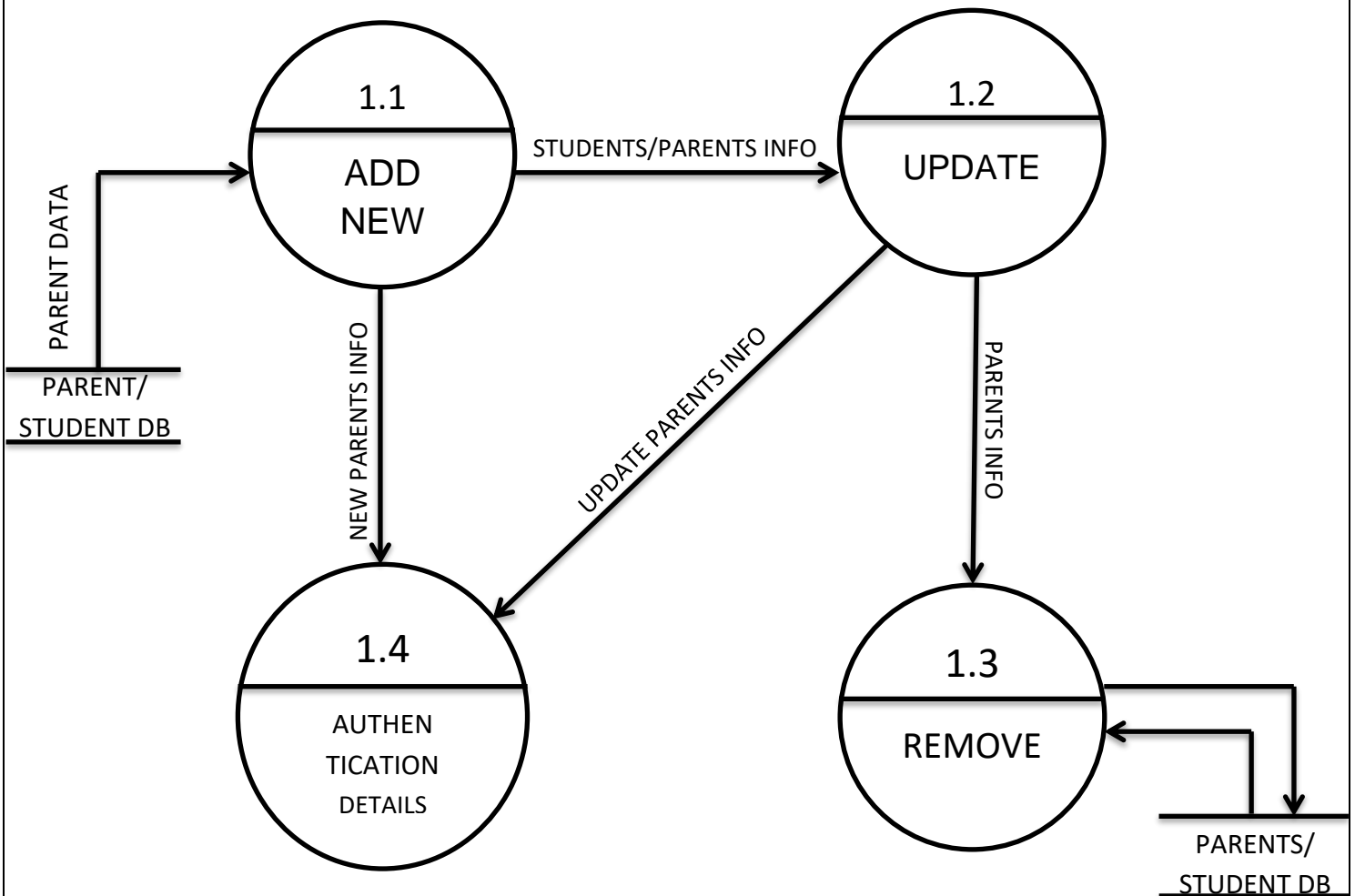
- ☐ **Operating System** :- **Microsoft Windows 10**
- ☐ **Front End** :- **Android SDK**
- ☐ **Back End** :- **Firebase/ MySQL Server**
- ☐ **Documentation** :- **MS Word 2013**

DATA FLOW DIAGRAM

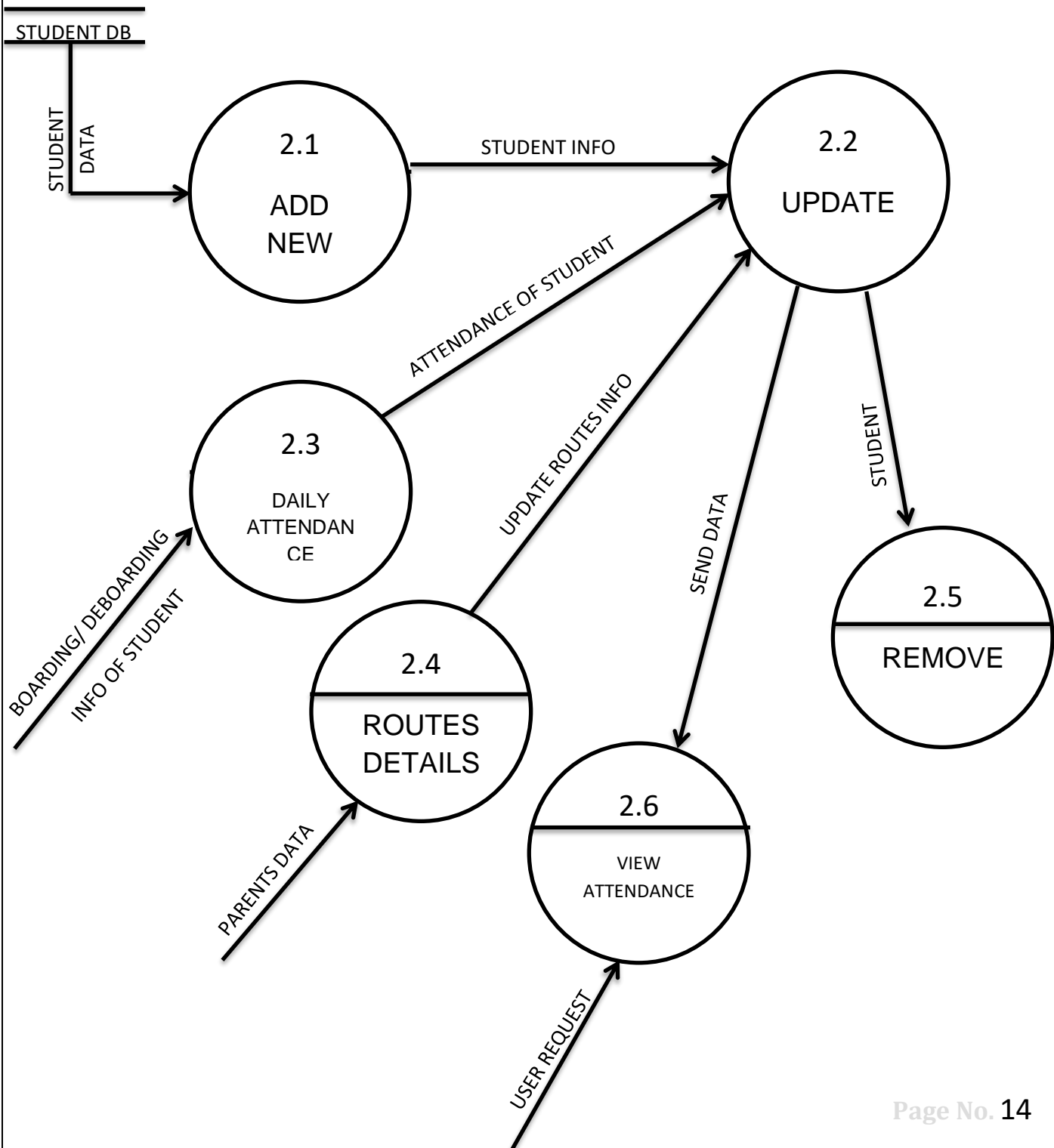
CONTEXT LEVEL DFD



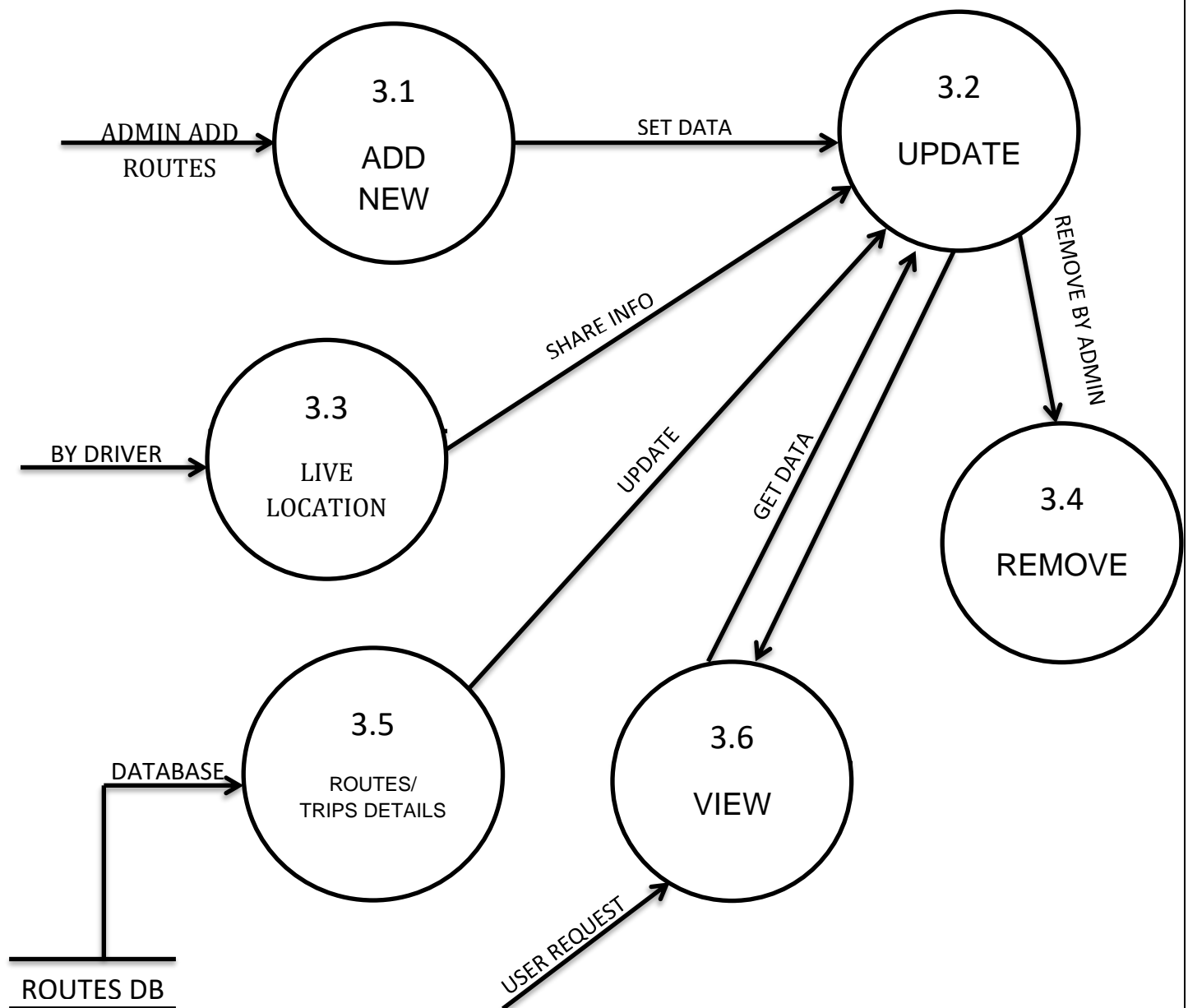
LEVEL 1 DFD FOR SCHOOL BUS TRACKING SYSTEM

LEVEL 2 DFD**Part 1**

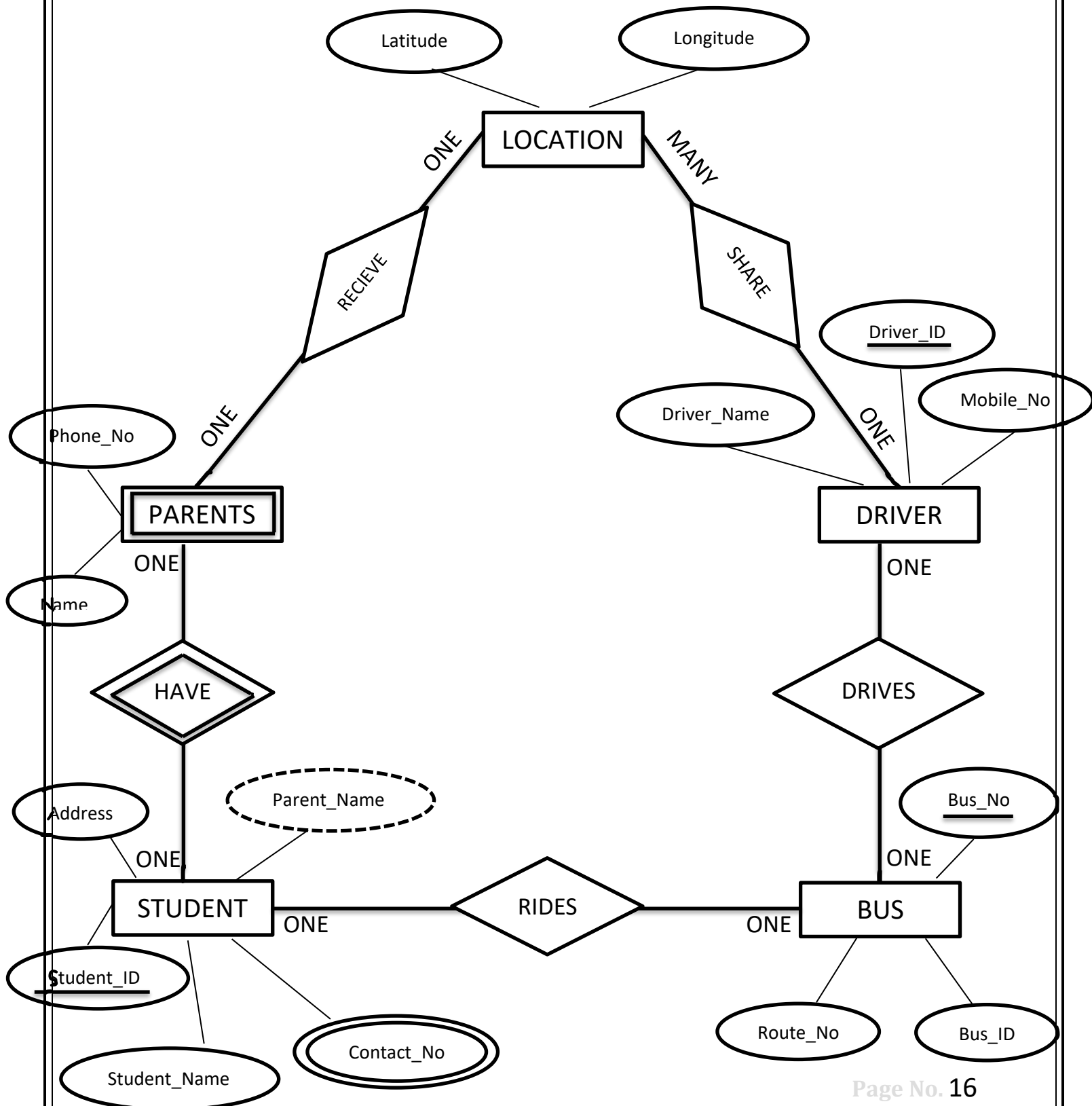
Part 2



Part 3



ENTITY-RELATIONSHIP DIAGRAM



DATA STRUCTURES

Table 1: Bus Information

Field Name	Type	Description
Bus_No	Character[20]	Primary Key
Route_No	Integer	
Driver_ID	Integer	
Conductor_ID	Integer	
Teacher_ID	Integer	
Student_ID	Integer	Foreign Key

Table 2: Route Information

Field Name	Type	Description
Route_no	Integer	Primary Key
Pick_up	Character[20]	
Drop_off	Character[20]	
Location	Character[20]	
Time	Float	
Bus_ID	Integer	Foreign Key
Bus_No	Character[20]	

Table 3: User Information

Field Name	Type	Description
Student_Name	Character[20]	Primary Key
Parent_Name	Character[20]	
Student_ID	Integer	
D_O_B	Character[20]	
Address	Character[50]	

Phone_No	Long Integer	
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Table 5: Driver Information

Field Name	Type	Description
Driver_Name	Character[20]	
Driver_ID	Integer	Primary Key
Bus_ID	Integer	Foreign Key
Bus_No	Character[20]	
Mobile_No	Long Integer	

Table 7: Main

Field Name	Type	Description
Student_ID	Integer	Primary Key
Bus_ID	Integer	
Bus_No	Character[20]	
Route_No	Integer	
Location	Character[50]	
Time	Time Stamp	
Latitude	Float	
Longitude	Float	
Next_Stop	Integer	
Last Stop	Integer	
Pick_up	Character[20]	
Drop_off	Character[20]	

NUMBER OF MODULES AND THEIR DESCRIPTION

The following are the major activities of SCHOOL BUS TRACKING SYSTEM. It contains the number of modules with their description. The modules used in this app are:

- 1) **Administrator Module**
- 2) **Driver Module**
- 3) **Parent Module**

1) Administrator Module

Administrator can login to the administrator account after verification and approval. He can enter new course points of interest and furthermore he can choose the course from the rundown of courses and after that the comparing stops are shown. He has the choices to include or expel a course. He additionally has the alternative to adjust or expel a prevent from

the course. In the event that administrator need to state any data to the driver then he can send the message to the driver's versatile through the program. He can likewise enter new understudy subtle elements and can see the rundown of understudies. He has the alternatives to include or expel understudy subtle elements.

2) Driver Module

Driver has to enter the mobile number and password to login the application. When the application is launched, the home activity fetches the routes from the server and binds it to the spinner for the driver to select it. If the driver selects "Start", the location of the bus will be uploaded to the server. If the driver presses the board button for a student then an alert message is sent to the parent app. While the bus travels, the parent will be updated with the location. When all the students have been dropped to their respective stops then the trip is deactivated.

3) Parent Module

Client has to enter the mobile number and password to login the application. Once the user has been logged in, then map is displayed which shows the current location of the bus. They will receive an alert notification when the bus came to the nearest stop. When the application is launched, the home activity fetches the routes from the server and binds it to the spinner for the client to select it. When the client selects the route, corresponding stops are fetched from the server and binded to the spinner for the client to select. If the client selects "Get Location" then the location details of the bus for the route is fetched. If the client selects "Show Map" then the location of the bus on the map will be display.

VALIDATION TO BE PERFORMED

- Any unauthorized person can't enter into system because each and every user of this system is already validated in system. At the time of entry system will ask for the password.
- There is validation check for parent and Driver.
- Every student should have a unique Student ID.

TYPES OF REPORT GENERATION

Trip report

Display the details of the trip with students and their address.

Number of Student on pick up or drop off

It displays how many students are travelling.

Location Report

It keeps track of the current Location of the bus.

Departure Report

It shows which student has been boarded at the specific time.

Arrival Report

It shows the arrival time of the bus.

LIMITATIONS OF THE PROJECT

- 2 GB RAM is required to use the app.
- Android 4.1 SDK or higher is required.
- The phone should be GPS enabled.
- Internet is required to run the app.

FUTURE SCOPE OF THE PROJECT

The app is built with modular approach and it is easier to maintain it. We can introduce RFID Technology with the software to mark the attendance of the students. Then driver will not have to take the attendance manually. The app can be integrated with transport fees module to pay the transportation fees.

BIBLIOGRAPHY

BOOKS-

- IGNOU Blocks
- Software Engineering- A Practitioner's Approach by Roger S.Pressman(7th Eddition)
- Robert Viera, Professional Microsoft SQL Server, 23 Aug 2009

JOURNALS AND ARTICLES-

- "Software Project Planning"-R.S.Pressman & Associates, Inc.
<https://www.rspa.com/spi/project-plan.html>

ONLINE RESOURCES-

- <https://www.w3schools.com>
- www.google.com
- www.youtube.com