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Detection Location For Bus School (DLBS) by Web Application

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Abstract

Millions of children need to be moved from home to school and vice versa every day. For parents, obtaining a safe transport for their children is a crucial issue. Many of the problems facing parents concerned track the progress of their children's line from the moment they came out of their homes and even their return to it again. Ease of access to Smartphone apps is transforming travel management. With much of the world waking up to the use of smart phones and becoming 'app-happy', it is perhaps logical and sensible for school bus operations to follow suit. Which is allowed pupils' parents to access real time information on bus locations and status via hand held devices. The app” Detection Location For Bus School (DLBS)” is the realization of a concept which goes back over a decade: provision of accurate, real time location information to parents. The app relies on a mix of Smartphone technology, GPS, automatic vehicle location and digital maps. PHP is a server-side scripting language designed for web development; We using PHP to connect android device and the MYSQL database. This project is use application to track the current location of the school bus by parents and the school authorities. The proposed systems also include parents about their child boarding the school bus. Also help the school to reduce the period of time to call the nearest driver is available instead of searching for the nearest driver to connect to the, for example, to transfer or buy things for the school it will pass from one place instead of sending a new driver for the other task .

Table of Contents

Chapter 1	11
Introduction.....	11
1.1 Background	12
1.2 Motivation of the project.....	12
1.3 Problem Statement	13
1.4 Project Objectives.....	14
1.5 Project Contributions.....	14
1.6 Project Scope and Limitation	15
 Chapter 2	 16
Literature Review.....	16
2.1 Introduction	17
2.2 Eclipse Programming	17
2.3 Technologies used	17
2.3.1 My SQL database:	17
2.3.2 PHP:.....	18
2.3.3 Service based location	19
2.3.4 Android:	19
2.4 Related Works	23
2.4.1 Nasik India	23
2.4.2 Jsion	23
2.4.3 LDBS application VS existing systems	24
2.5 conclusion.....	25
 Chapter 3	 26
Project Methodology	26
3.1 Introduction	27
3.2 What is methodology.....	27
3.3 Advantages of methodology.....	27
3.4 What is Vehicle Security System?	27

Chapter 4	31
Software Requirement Specifications and Analysis	31
4.1 Introduction	32
4.2 Software Requirements Specification	32
4.2.1 Functional Requirements.....	32
4.2.2 Non-Functional Requirements	33
4.2.3 System Requirements	34
4.3 Requirements Analysis.....	35
4.3.1 Use Case Diagrams	35
4.3.2 Activity Diagrams	39
 Chapter 5	 52
Design and Implementation	52
5.1 Introduction	53
5.2 System Design.....	53
5.2.1 System Architecture	53
5.2.2 Entity Relationship Diagram.....	55
5.2.3 Graphical User Interfaces	56
5.2.3.1 Detection Location For Bus School Web Application GUI:	56
5.2.3.2 Detection Location For Bus School mobile Application GUI:	58
5.4 Implementation.....	65
 Chapter6.....	 66
Testing and Evaluation	66
6.1 Testing.....	67
6.1.1 Test Environment.....	68
6.1.2 Testing Process Stages	69
6.1.3 Checklist System Testing	69
6.1.4 Web Application Automated Testing.....	65
6.2 Maintenance	76
6.3 Evaluation.....	76

Chapter 7	77
Discussion, Conclusion and Future works	77
7.1 Introduction	78
7.2 Project Challenges	78
7.3 Conclusion.....	78
7.4 Future Works.....	79
7.5 References	80

Table of Figures

Figure 2.1 Dex File on Dalvik VM	21
Figure 3.1 Iterative SDLC	29
Figure 4.3 DLBS Web Application for Administration Use Case	38
Figure 4.2 DLBS Web Application for Parent Use Case	37
Figure 4.1 DLBS Web Application for Institutions Use Case.....	36
Figure 4.4 Institutions Signup Activity Diagram	39
Figure 4.5 shows the activity diagram for login into DLBS web application.	40
Figure 4.5 Institutions Login Activity Diagram	40
Figure 4.6 Edit Profile Activity Diagram	41
Figure 4.7 Manage connection Activity Diagram	42
Figure 4.8 Search by Name Activity Diagram	43
Figure 4.9 Login into Application Activity Diagram.....	44
Figure 4.10 View school Profile Activity Diagram.....	45
Figure 4.11 View connection Activity Diagram	46
Figure 4.12 Search connection Activity Diagram	47
Figure 4.13 Admin Login Activity Diagram.....	48
Figure 4.14 Edit Schools Details Activity Diagram.....	49
Figure 4.15 Manage Schools connection Activity Diagram.....	50
Figure 4.16 Delete Schools Activity Diagram	51
Figure 5.1 Detection Location For Bus School System Architecture	54
Figure 5.2 Location For Bus School System Entity Relationship Diagram (ERD)	55
Figure 5.4 School View Profile.....	57
Figure 5.3 Detection Location For Bus School Website Home Page	56
Figure 5. 5 shows login into Detection Location For Bus School mobile application.	58
Figure 5. 5 Detection Location For Bus School Mobile App Login	58
Figure 5.6 View School ID as Mobile ID.....	59
Figure 5.7 View Drivers School bus position.....	60
Figure 5.8 View connection Details and location provider.....	61

Figure 5.9 Options on location provider	62
Figure 5.10 Send Messages to server as location provider.	63
Figure 5.12 Search on driver's bus.....	64
Figure 6.1 Testing Process Stages	69
Figure A1 DLBS Questionnaire Result.....	84
Figure A2 DLBS Acceptance Percentage	85

List of Tables

Table 2.1 DLBS Application vs. existing systems	24
Table 6.1 Web App Functionality Checks	70
Table 6.2 Web App Data Fields Checks	71
Table 6.3 Web App Interface And Error Handling Checks	72
Table 6.4 Web App Compatibility And User Interface Checks	74

List of Abbreviations

Abbreviation	Full State
DLBS	Detection Location For Bus School
GPS	DLBSGlobal Positioning System
GPS	Global Positioning System
SMS	Short Message Service
SQL	Structure Query Language
PHP	personal Home Page
FTP	File Transfer Protocol
LBS	Location For Bus School
IP	Internet Protocol
ATM	Automated Teller Machine
HTC	High Tech Computer
G1	First Generation
OS	Operating System
VM	Virtual Machine
XML	extendable Markup Language
HTML	Hyper Text Mark-up Language
CSS	Cascading Style Sheets
API	Application Programming Interface
AD	Application Development
GSM	Global System for Mobile
SDK	Software Development Kit
GUI	Graphical User Interface

IDE	Integrated Development environment
JER	Java Runtime Environment
JDK	JAVA Development Kit
XP	EXTREME Programming
CMS	Content management system
CRC	Class Responsibility Collaborator
OOP	Object Oriented Programming
UML	Unified Modeling Language
PDA	Personal Digital Assistant
AC	Activity
APPSERV	Apache Server
UI	User Interface
ERD	Entity Relationship Diagram
ADT	Android Developer Tools
DDMS	Dalvik Debug Monitor Service
UX	User Experience
AVD	Android Virtual Device
DVM	Dalvik Virtual Machine
DB	Database
TBS	Technology Building System

Chapter 1

Introduction

1.1 Background

Now a day's most parents are working. So it becomes difficult for them to pick and drop their child every day to school. Here the bus transport provided by the school comes into picture. Parents face the problem of waiting for the bus to arrive. The main purpose of our proposed system is to calculate and provide the parents with the estimated time bus will take to reach the bus stop and also provides the current location of the bus. In Gaza Strip, a child goes missing every eight minutes according to the data from UNRWA records.. The proposed system aims to provide the child boarding the school bus. The app" Detection Location For Bus School (DLBS)" is the realization of a concept that goes back more than a decade: terms of perfect, real time location information to parents. The app relies on a mix of Smartphone technology as Android, GPS, automatic vehicle location and Google maps. In case you change the bus en route to a specific cause or in some special cases Leisure trips parents determine where present their children could have been consensus that are named this Tracking bus system. Where can parents through this system the where about of the bus through technology (GPS) and through smart cards technology and contact with cellular phones.

1.2 Motivation of the project

• From the perspective of parents:

Control system needed by residents to speed in performance and ease of access to information required in time, due to the widespread use of cell phones and speed performance, it is easy for parents to use to communicate with the school or school services Such as buses that transport their children to make sure of the whereabouts of their children at a time specific, and contributed this service for the people in solving the following problems:

1. The problem of wasting time in contact at the school and a review of rows to see if their children in the class or not.
2. Problems were time to contact on the school bus to make sure whether their child may ride the bus or not.
3. There are no similar systems, especially in the Gaza market offers solutions and avoid the difficulties faced by citizens access to information regarding their children's time and to ensure that their escape from schools in the easiest way.

Most of the Tracer server configuration parameters are located in a single text file (traccar.xml). On Linux and Mac platforms the path to the file is ‘/opt/tracer/conf/’; on Windows the path can be changed during the installation process, but by default it should be in ‘C:\Program Files\Tracer\conf’ or in ‘C:\Program Files (x86)\Tracer\conf’ on 64 bit Windows. Configuration file can be edited using any text editor. Following table contains available configuration keys and descriptions for each of them. Web interface TCP port number. By default Tracer uses port 8082. To avoid specifying port in the browser you can set it to 80 (default HTTP port). Reverse decoder type. Currently Tracer support following types: Google, nominate and geography. By default (if the value is not specified) server uses Google API. Database user password. Default password for H2 admin (as) user is empty. SQL query to insert a single position record into the database. Following named parameters (must have colon prefix) are available: devised – device identifier in the database (same as ‘id’ in database. select Device) fix Time – date and time of the position fix valid – true if location is accurate, false if location is incorrect or not accurate latitude – latitude reported by the GPS device longitude – longitude reported by the GPS device speed – speed value in knots course – heading/bearing in degrees address – resolved address of the location (requires decoder to be enabled) protocol – name of the protocol other – other data in XML format (for example, <info><odometer>1000</odometer></info>).

1.3 Problem Statement

Most of parents suffer from how to communicate with the school bus drivers to check whether their children had boarded the bus or not, as well as experiencing some schools of the possibility of providing the required all students the information in a timely manner, and also suffer some schools to communicate with bus drivers and transparency in dealing with drivers especially with regard to their whereabouts during working hours and in case of non-transfer students, so the goal of this project is:

How to activate the mobile phone applications that facilitate the search, access and communicate with the bus transfer students.

1.4 Project Objectives

To build a website Detection Location For Bus School (DLBS) aims to which achieve the following:

1. To create a central database that can include educational institutions to act in accordance with this system.
2. Create a web page for schools that have accounts to update and manage their contacts in the database.
3. Connect this information with cell phone applications GPS- smart cards.
4. To enable social networking features through cell phone applications with educational institutions (instant messages, and view the status of presence).
5. Building mobile application works on:

reate a new system complements the system of communication between educational institutions and parents.

Provide the necessary information for parents about the whereabouts of their children through the use of modern technologies.

Reduce the problem of dropping out of school by sending text messages to the people.

1.5 Project Contributions

The importance of this project that it is possible helps any citizen who wishes to communicating with the educational contacts.

Both parents and schools that facilitate access to the information and deal will work with the bus system. Which is contacted the needs Detection Location For Bus School (DLBS), which is designed to do so.

The System (DLBS) is working on strengthening the Palestinian mobile applications industry, which sponsors the focus on solving communicating problems.

(DLBS) application is work around the traditional scenarios (waiting time, cost, and transparency).

1.6 Project Scope and Limitation

1. The proposed system has limited scope and is a small scale project.
2. The project will be implemented for limited number of buses and routes.
3. Detection is limited it will be installed in the bus only.
4. Calculating the estimated arrival time of the bus.
5. Tracking the bus i.e. providing the location of the bus.
6. Notification of child boarding the school bus and arrival at school to the respective parents.
7. The main drawback can be the load on the server.
8. The server may not be able to handle the load.

Chapter 2

Literature Review

2.1 Introduction

This chapter reviews and identifies the technologies systems which were used to create the DLBS system, also clarify business concepts and related work in the business market.

2.2 Eclipse Programming

Eclipse started as a proprietary IBM product (IBM Visual age for Smalltalk/Java)

- Embracing the open source model IBM opened the product up
- Open Source
- It is a general purpose open platform that facilitates and encourages the development of third party plug-ins
- Best known as an Integrated Development Environment (IDE)
- Provides tools for coding, building, running and debugging applications
- Originally designed for Java, now supports many other languages
- Good support for C, C++
- Python, PHP, Ruby, etc...

Prerequisites for Running Eclipse :

Eclipse is written in Java and will thus need an installed JRE or JDK in which to execute

- JDK recommended

2.3 Technologies used

2.3.1 My SQL database:

A lot of computer programs, as well as web-based programs like blogs, photo galleries and content management systems need to store and retrieve data. For example, blog software need to store the posts (i.e., articles) you write, and retrieve them when a visitor goes to your site. Similarly, photo galleries store information about their pictures (for example, for sites that allow users to rate the photos, the numerical rating for each picture is stored in a database).

Instead of reinventing the wheel and implementing their own system of storing and retrieving data, these software simply use the specialized database programs I mentioned earlier. To make it easy for other programs to access data through them, many database software support a computer language called "SQL" (often pronounced as "sequel"). SQL was specially designed for such a purpose. Programs that want the database software to handle the low-level work of managing data simply use that language to send it instructions. There are many databases that support the use of SQL to access their data, among them MySQL and PostgreSQL. In other words, MySQL is just the brand of one database software, one of many. The same goes for Postgre SQL. These two databases are very popular among programs that run on websites (probably because they are free), which is why you often see one or both of them being advertised in the feature lists of web hosts, as well as being listed as one of the "system requirements" for certain web software.[1]

2.3.2 PHP:

“Is a server-side scripting language designed for web development but also used as a general-purpose programming language As of January 2013, PHP was installed on more than 240 million websites (39% of those sampled) and 2.1 million web servers. Originally created by Rasmus Lerdorf in 1994, the reference implementation of PHP is now produced by The PHP Group. While PHP originally stood for Personal Home Page, it now stands for PHP: Hypertext Preprocessor, a recursive backronym.” [2]

“PHP includes free and open source libraries with the core build. PHP is a fundamentally Internet-aware system with modules built in for accessing File Transfer Protocol (FTP) servers, many database servers, embedded SQL libraries such as embedded PostgreSQL, MySQL, Microsoft SQL Server and SQLite, LDAP servers, and others. Many functions familiar to C programmers such as those in the stdio family are available in the standard PHP build.” [3]

2.3.3 Service based location

A location-based service (LBS) is a software application for a IP-capable mobile device that requires knowledge about where the mobile device is located. Location-based services can be query-based and provide the end user with useful information such as "Where is the nearest ATM?" or they can be push-based and deliver coupons or other marketing information to customers who are in a specific geographical area.

An LBS requires five basic components: the service provider's software application, a mobile network to transmit data and requests for service, a content provider to supply the end user with geo-specific information, a positioning component (see GPS) and the end user's mobile device. By law, location-based services must be permission-based. That means that the end user must opt-in to the service in order to use it. In most cases, this means installing the LBS application and accepting a request to allow the service to know the device's location.

2.3.4 Android:

“Android is a Linux-based open source platform. It is backed by Google with the foundation of Open Handset Alliance that includes 65 technical leader companies like HTC, Intel, Qualcomm, NVIDIA, and T-Mobile. The G1, the first Android-based phone, was launched in 2008 by HTC. The Android Development Kit is available for Windows, Linux and Mac OS. Applications are developed in Android using a version of the Java programming language running on the Dalvik virtual machine.” [4]

• Dalvik Virtual Machine and Android Applications

“Every Android application runs in its own process, with its own instance of the Dalvik virtual machine. Dalvik has been written so that a device can run multiple VMs efficiently. The Dalvik VM executes files in the Dalvik Executable (.dex) format, which is optimized, for minimal memory footprint. The VM is register-based and runs classes compiled by a Java language compiler that have been transformed into the .dex format by the included "dx" tool.” [5]

•The Dex File Format

On the Android platform, Java source code is still compiled into .class files. However, after .class files are generated, the “dx” tool is used to convert the .class files into a .dex, or Dalvik Executable, file. Whereas a .class file contains only one class, a .dex file contains multiple classes. It is the .dex file that is executed on the Dalvik VM. Dalvik is a discontinued[1] process virtual machine (VM) in Google's Android operating system that executes applications written for Android. Dalvik is an integral part of the Android software stack in Android versions 4.4 "KitKat" and earlier. A tool called dx is used to convert Java .class files into the .dex format. Multiple classes are included in a single .dex file. Duplicate strings and other constants used in multiple class files are included only once in the .dex output to conserve space. A Java class file is a file (with the .class filename extension) containing Java byte code that can be executed on the Java Virtual Machine (JVM). A Java class file is produced by a Java compiler from Java programming language source files (.java files) containing Java classes. If a source file has more than one class, each class is compiled into a separate class file.

As shown in figure 2.1 Dex File on Dalvik VM

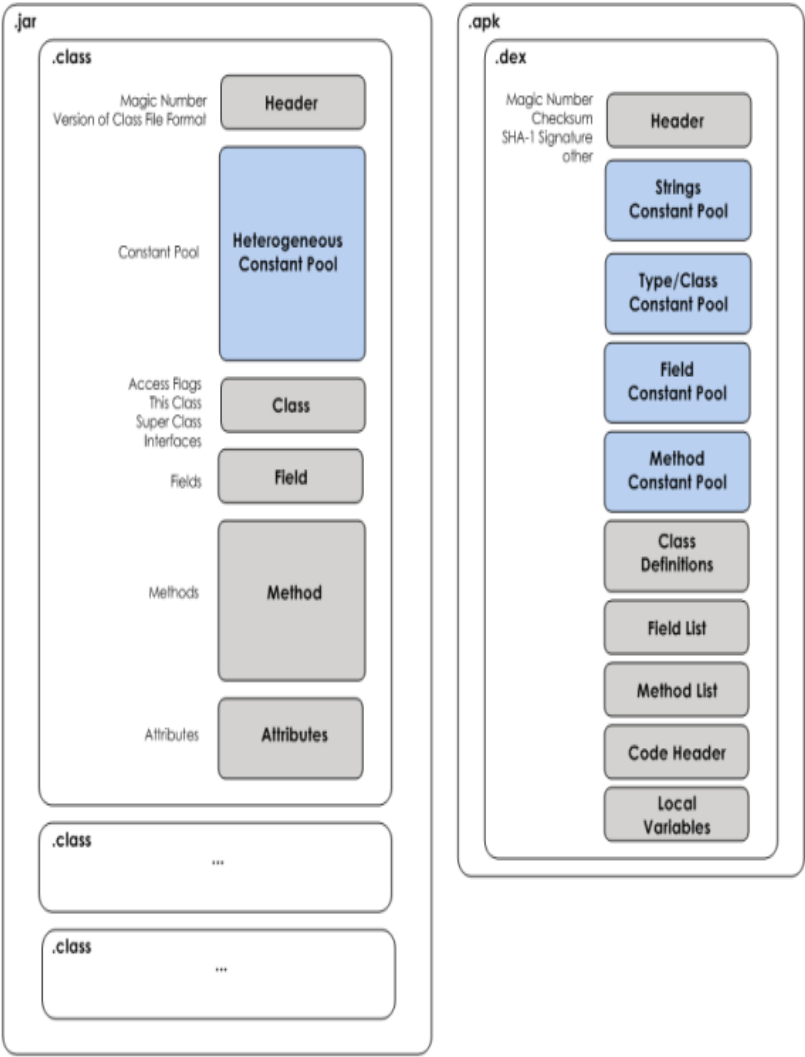


Figure 2.1 Dex File on Dalvik VM

•Java and XML

Android uses the Java class library to build applications for the Android software environment. Java on Android makes use of XML for variables such as strings and integers. XML is used to control the layout and style of an application. This separate layer convention is similar to Hyper Text Markup Language (HTML) for content and Cascading Style Sheet (CSS) in style. There are differences because of different languages and functionalities since HTML is not a programming language as Java is. However, from a conceptual level, this comparison can be made. As far as practical aspects are concerned, Java defines the button's functionality, while XML defines the buttons' text, color, font-weight, and size.

Google Maps

It is a desktop and mobile web mapping service application and technology provided by Google, offering satellite imagery, street maps, and Street View perspectives, as well as functions such as a route planner for traveling by foot, car, bicycle (beta test), or with public transportation.

Also supported are maps embedded on third-party websites via the Google Maps API,[1] and a locator for urban businesses and other organizations in numerous countries around the world. Google Maps satellite images are not updated in real time; however, Google adds data to their Primary Database on a regular basis. Google Earth support states that most of the images are no more than 3 years old.[2]

The opt-in redesigned version of the desktop application has been available since 2013, alongside the "classic" (pre-2013) version. The redesigned version was met by user criticism regarding slowness,[3] hiding some common functions, removing a scale bar, and lack of other features that include My Places and sharable customized links to parameterized split Street View and Map views.[4] It is possible to switch back to the old version.[5]

2.4 Related Works

2.4.1 Nasik India

In [7], the hardware and software of the GPS and GSM network were developed. The proposed GPS/GSM based System has the two parts, first is a mobile unit and another is controlling station. The system processes, interfaces, connections, data transmission and reception of data among the mobile unit and control stations are working successfully. These results are compatible with GPS technologies. In [8], a vehicle tracking system is an electronic device, installed in a vehicle to enable the owner or a third party to track the vehicle's place. This paper proposed to design a vehicle tracking system that works using GPS and GSM technology. This system built based on embedded system, used for tracking and positioning of any vehicle by using Global Positioning System (GPS) and Global system for mobile communication (GSM). This design will continuously watch a moving Vehicle and report the status of the Vehicle on demand.

2.4.2 Jsion

Implementation of system involves android application development. In that android tools (SDK) are used to design application form i.e. Registration module. Data from user will be accepted through this GUI. From Server side appropriate response will be given to the customer using web service. As android data parsing and server side data parsing is different, it is managed through PHP web service. Main aim is to provide tracking of service to the customer that will be provided by server side and displayed in the form of progress bar. Notification will be given using android services.

2.4.3 DLBS application VS existing systems

Table 2.1 DLBS Application vs. existing systems

Features	Nasik India	Jsion	GPS Tracker	Linux up	DLBS
Guinness for main School information	✓	X	✓	✓	✓
View Student's contacts information	X	✓	✓	✓	✓
Availability of driver inside school " View status"	X	✓	✓	✓	✓
Availability to any parent's	✓	X	✓	X	✓
Easy to search	✓	✓	✓	✓	✓
Social communication	X	✓	X	✓	✓

From above comparison between our applications "DLBS" with other similar applications in Table2.1 DLBS application provide a lot of benefits that business need and citizens look for, these benefits will be more attractive to our target area in business market also ensure popularity and success of our system.

2.5 conclusion

This chapter tools and software and languages that were used in the program where the use of the database SQL server to store and retrieve data and use Google Maps uploaded both points and doubting the student. Android Architecture as it shows the components of the software and consists of four layers of .Widgets are installable Web applications that use technologies such as HTML and JavaScript. From table 2.1 we can looking to find that Guinness for main School information applied in Nasik India but not applied in Jsion. Also , in availability to any parent's features applied in Nasik India but not applied in Jsion. But in opposite of applied of three features (View Student's contacts information , Availability of driver inside school “ View status” and Social communication) able in Jsion but not applied in Nasik India and but GPS Tracker not have shearing in social communication> Availability of a system may also be increased by the strategy of focusing on increasing testability, diagnostics and maintainability and not on reliability.

Chapter 3

Project Methodology

3.1 Introduction

This chapter describes the methodology which used in this project, clarifying its phases and advantages.

3.2 What is methodology

Methodology is a documented process for managing projects containing procedures and definitions and interpretations used in the collection, storage, analysis and presentation of information as part of the search process Where was the use of tracer methodology step by step analysis of the test in the case of an error the test are referenced from the first analysis of the .

3.3 Advantages of methodology

- 1 .Better planning .
2. Improved quality of system produced .
- 3 . Consistency .
4. Thoroughness .

3.4 What is Vehicle Security System?

A Vehicle security system is a system that combines the Internet technology, GPS and GPRS technologies to track down the location of vehicles. This measure helps in monitoring the location in case of theft of the cars. It can either prevent a car from getting stolen or help in retrieving a stolen car. This security system helps in finding out the location of a vehicle using different methods. It is basically an electronic Internet based system that uses modern technological tools and added authentication related features for taut security. It is basically computer software installed at least at one operational base to enable the owner or a third party to track the vehicle's location. Vehicle monitoring System allows a party to locate, trace and monitor its vehicles in real time. With the GSM/GPRS technology, security can be implemented by collecting data about the vehicle in the process from the field and deliver it to the base of operation. The vehicle security system is of two types basically: passive and active. The location according to GPS coordinates is stored in Passive devices along with the speed, heading and sometimes a trigger event such as key on/off, door open/closed. Vehicle tracking system combines the installation of an electronic device in a vehicle with Internet technology, terrestrial networks and GPS. Once the vehicles come back to the predetermined location, we remove the device and download the data to the computer. Passive device employ wireless transferring of data and its download procedure is automatic. Active devices also collect the same information but usually transmit the data in real-time via cellular or satellite networks to a computer or data centre for evaluation. The device fitted in the vehicle has a built in GPS receiver determines the vehicle location, traveling speed, direction etc..

The secure system of tracking the vehicle only with the help of an electronic device and computer software is very accurate and provides the desired results with great finesse. The device transmits the data via GSM/GPRS wireless network to the Vehicle Tracking Application. If no network is detected, the data is stored locally and sends when the network is established. Modern vehicle tracking systems commonly use GPS or GLONASS technology for locating the vehicle. Though once can also use other types of automatic vehicle location technology. Internet in combination with the maps and software can give us some information on the vehicle. The GPS data sent by the device is stored in a secured database of Vehicle Tracking application. The vehicle security system has become an intrinsic part of the measures taken to stop vehicle stealing and increase the sense of security among the car owners and the owners of the other vehicles.

Development Requirements:

Tools will used to develop the system

- ✓ Eclipse version: 4.3.1
- ✓ Notepad++version: 6.5
- ✓ SQL Server Management
- ✓ APPSERV version: 2.5.9
- ✓ Photoshop version: CC Creative Cloud
- ✓ Visio version: 2013 professional
- ✓ Microsoft Project Management

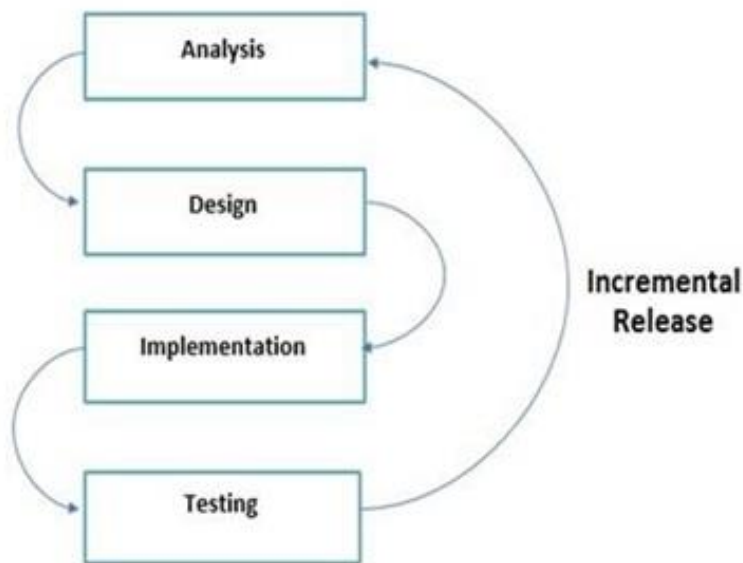


Figure 3.1 Iterative SDLC

□ Analysis

process of breaking a complex topic or substance into smaller parts in order to gain a better understanding of it. Requirements analysis – encompasses those tasks that go into determining the needs or conditions to meet for a new or altered product, taking account of the possibly conflicting requirements of the various stakeholders, such as beneficiaries or users. DLBS system is an advanced method to track and monitor any remote vehicle with the device that receives and sends signals through GPS satellites. The components of DLBS are Global Positioning System (GPS) and Geographic Information System (GIS) which provide the real geographic location of the vehicle. DLBS system consists of PC-based tracking software to dispatch, a radio system, GPS receiver on the vehicle and GPS satellites.

□ Designing

This design phase includes the following steps that will take into account :

- 1 Specify system architecture and Database relations.
- 2 Make bus tracing Simple as possible.
- 3 Use smart cards for CMS design sessions.

□ **Implementation**

a realization of a technical specification or algorithm as a program, software component, or other computer system through computer programming and deployment. Stand alone global positioning system receivers are widely used nowadays to accurately locating one's position. By using stand alone GPS receivers the distance between two locations on earth can also be measured. This project is aim to design and implement a low cost Global Positioning System suitable to be used for hiking, climbing and sailing activities. A Smartphone application is also developed for continuously monitoring the vehicle location. The Google Maps API is used to display the vehicle on the map in the Smartphone application. Thus, users will be able to continuously monitor a moving vehicle on demand using the Smartphone application and determine the estimated distance and time for the vehicle to arrive at a given destination.

□ **Testing**

This phase includes the following steps:

1. All code must have unit tests.
2. All code must pass all unit tests before it can be released.
3. When a bug is found tests are created.
4. Acceptance tests are run often and the stories published.

More details shown in chapter 6 “Testing and evaluation”.

Chapter 4

Software Requirement Specifications and Analysis

4.1 Introduction

This chapter describes the project requirements specification based on requirements gathering ways which used in project analysis.

4.2 Software Requirements Specification

In this Section, all users and system requirements are gathered from user stories through interviewing with many schools, requirements specified based on listening to their problems to specify solutions, these regiments including functional, nonfunctional and system requirements. After all requirements gathering development requirements are specified for later design and implementation.

4.2.1 Functional Requirements

The goal of functional requirement is to determine the behavior of users for “Bus School” in terms of functionality. To clarify the processes of Bus School system it must know there are two basic components of Bus School system are Web application include (accounts for schools) and android application (to view information for Bus School).

• **Registration Management:**

The system must allow users “Institutions” to register and login into the system.

☐ **Registration**

- ✓ The system shall able sign up through official website.
- ✓ The system must validate user’s login, so the user can enter valid user name and password to login in the system.
- ✓ The user can restore username and password if data requirement to open account is forgotten.

• **School Management:**

The student must be able to manage all information about the school students such as ability to add information, mobile number, and other details through webpage account .

- ✓ The user “School” must be able to add student information such as class, numbers, social accounts and other details .
- ✓ The user must be able to delete or update student information.

• **Users Operations:**

The system must allow users “Parent” to view school profile and other things associated with Schools after download Bus School application.

- ☐ The users should register mobile number as identity to login in application.
- ☐ The users must able view school’s profile and their student contacts information such as image, information, mobile number, and other details.
- ☐ The user can send instant messages to student and view their availability in the application.

• **Search Management**

The system must be able to enable searching from student to find them.

4.2.2 Non-Functional Requirements

• **Performance Requirement**

Bus Tracking system must be on very high standard servers to accommodate the huge amount of data and requests for access to the server from a large number of users at the same time.

- **Security Requirement**

In Bus Tracking system, the database must be located in a special secure server and must have backups to other servers directly at specific times to avoid loss and damage data.

- **Usability Requirement**

In Bus Tracking system, the users (School, Parent) interfaces must be familiar to users, so that the users can easily complete their tasks without any training or help.

- **Reliability Requirement**

Bus Tracking system should provide accurate and reliable information about contacts to all users. That ensuring success and adoption of the system as accurate information source.

- **Availability Requirements**

The system should be available at all times, meaning the Bus Tracking users can access it anytime 24 hours

- **Flexibility Requirements**

The system must be able to add or delete features because it is based on object-oriented concept.

- **Maintainability Requirement**

Using the concept of OOP, upgrade of the project and problem-solving is easier.

4.2.3 System Requirements

Since web and mobile technologies and external database server, system requirements will used to build project, system requirements include operation and development requirements which specified as the following:

- ☐ **Operation Requirements:**

Software requirements which include hardware and software requirements should be specified as the following:

☐ **Software Requirements:**

Software requirements which were used:

- ✓ Operating system: any computer OS.
- ✓ Internet Access for browsing Bus

Tracking web application.

- ✓ Android platforms for run Bus

Tracking application.

☐ **Data Mobile Requirements**

Data Mobile requirements which were used:

- ☐ Computers or any device connecting to internet.
- ☐ Mobiles or any device support Android operating system.

4.3 Requirements Analysis

In this section, we use modeling system “UML diagrams” based on requirements analysis through meetings and user stories to describe the functions and processes that system shall to do.

4.3.1 Use Case Diagrams

A use case diagram is a static description of some way in which the application is used. This diagram shows how the application use cases are related to each other and how the users can get at them. Each bubble represents a use case, and each stick person represents a user. Bus School system has three main actors include (Web user, admin user, android user) which have many different processes in three integrated system to run the whole system. Here we describing (Web System for Institutions, Android System for Student, and Web System for Administration) as the following UML description.

□ Web Application for Institutions Use Case Diagram

Figure 4.1 illustrates Bus School web application use case, that shows there is one actor represent web user “School” and many use cases that represent the main process that system enabling to do them starting from login and registering and add connection also all updating operations on connection information.

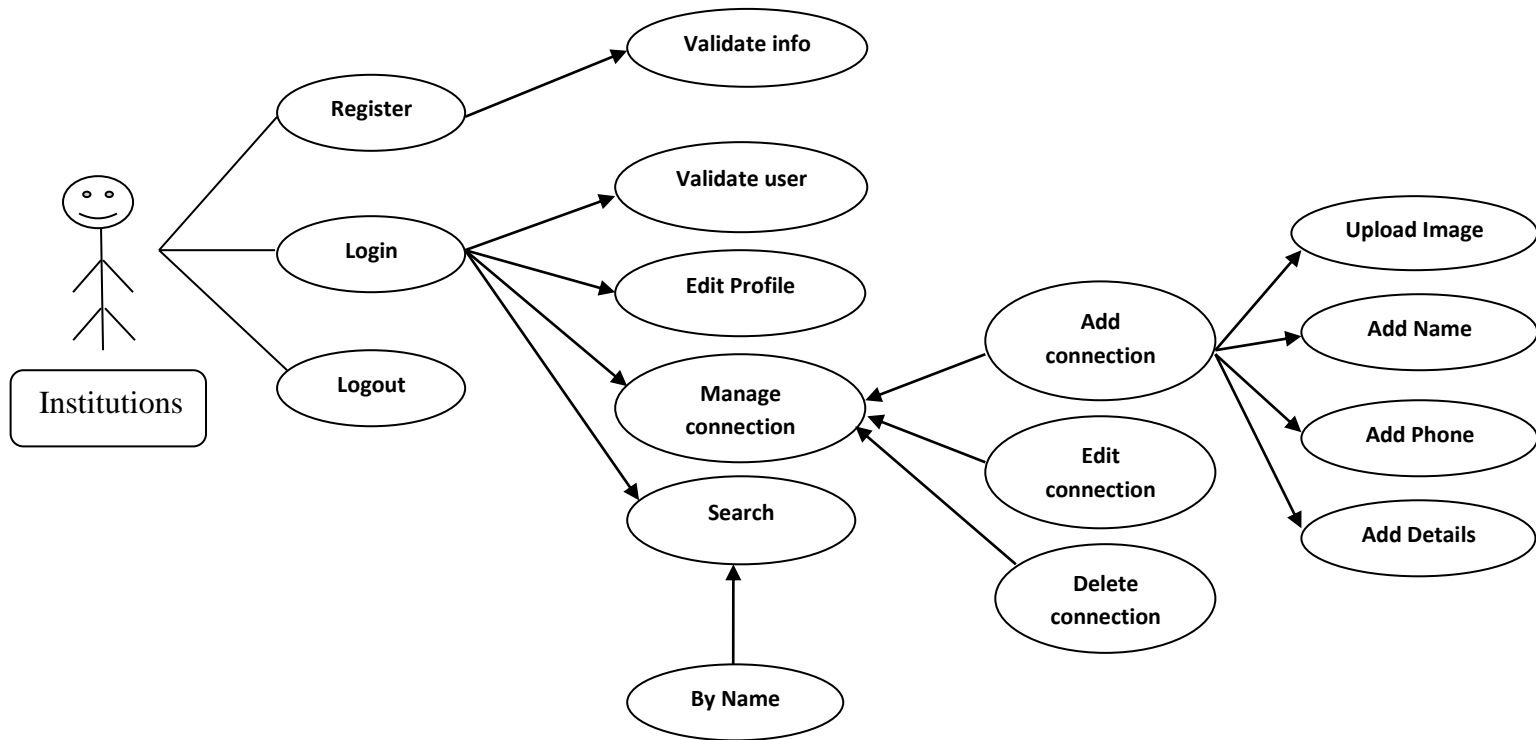


Figure 4.1 DLBS Web Application for Institutions Use Case

□ Web Application for Parent Use Case Diagram

Figure 4.1 illustrates **DLBS** Web application use case, that shows there is one actor represent android user “**Parent**” and use cases that represent the main process that system enabling to do them starting from login ,view connection details also search and connection with student by calling or sending messages.

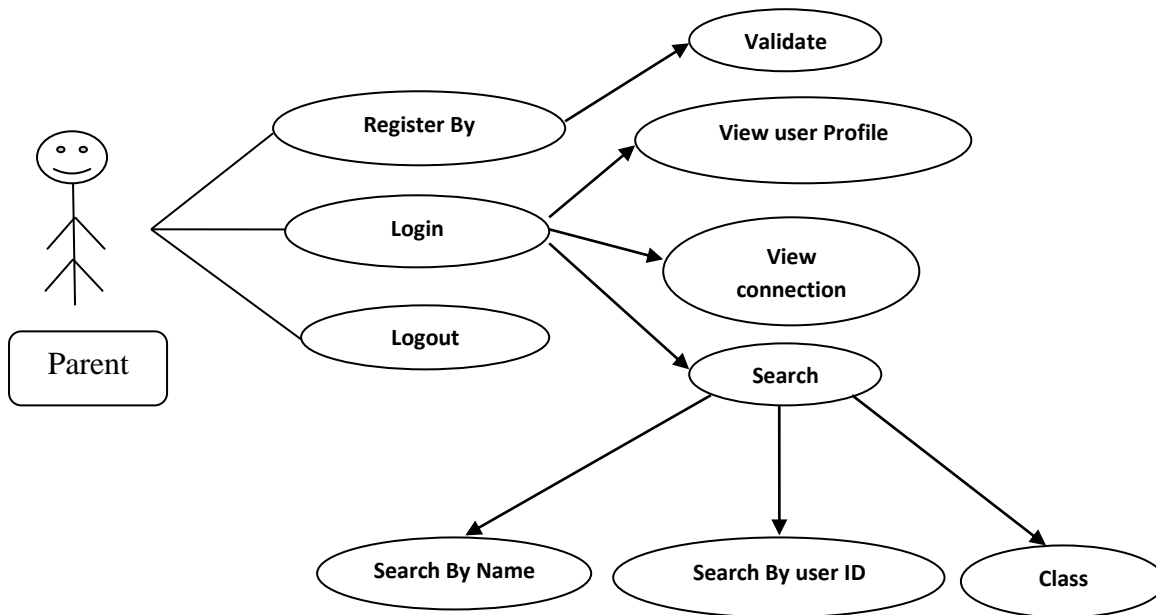


Figure 4.2 DLBS Web Application for Parent Use Case

□ Web Application for Administration Use Case Diagram

Figure 4.3 illustrates **DLBS** administration web application use case, that shows there is one actor represent web user “Admin” and use cases that represent the main process that admin can doing it, such as view registered schools and editing on their information if necessary and delete schools .

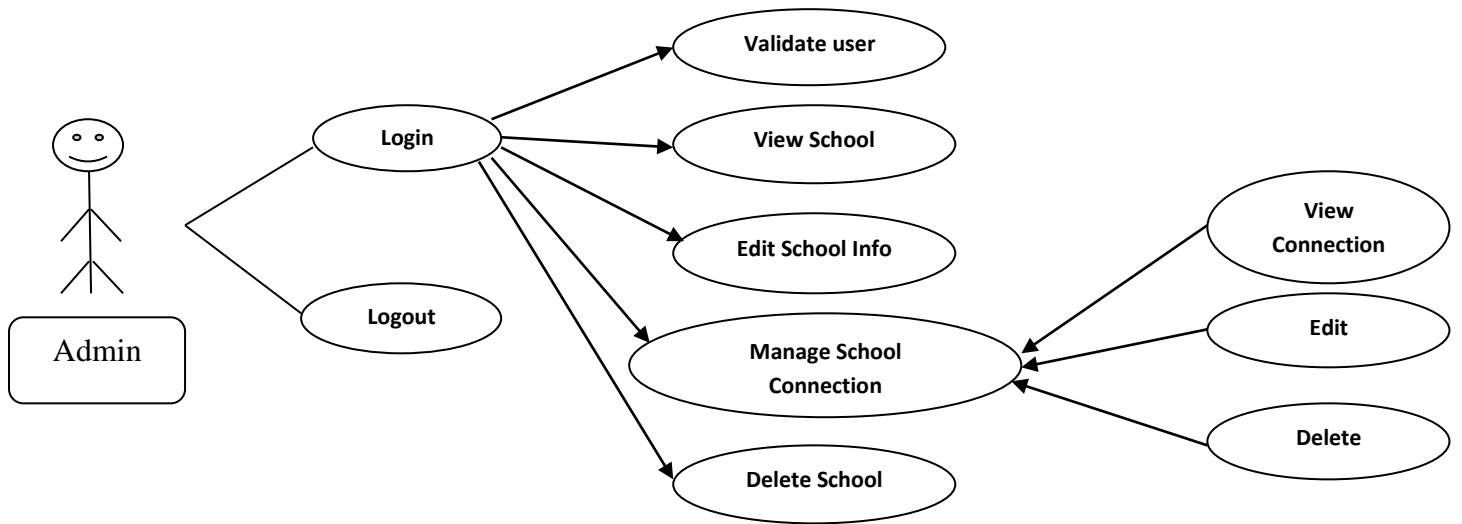


Figure 4.3 DLBS Web Application for Administration Use Case

4.3.2 Activity Diagrams

Activity diagrams (AC) can be used to describe the business and operational step-by-step

workflows of Schools in a system. Here we describe **DLBS** System from institutions Sign Up until Parent view contacts and all necessary processes as the following:

□ Activity Diagrams for Institution DLBS Web System

AC 1: Institutions Sign up

Figure 4.4 shows the activity diagram for new school to register in **DLBS** system to have an account .

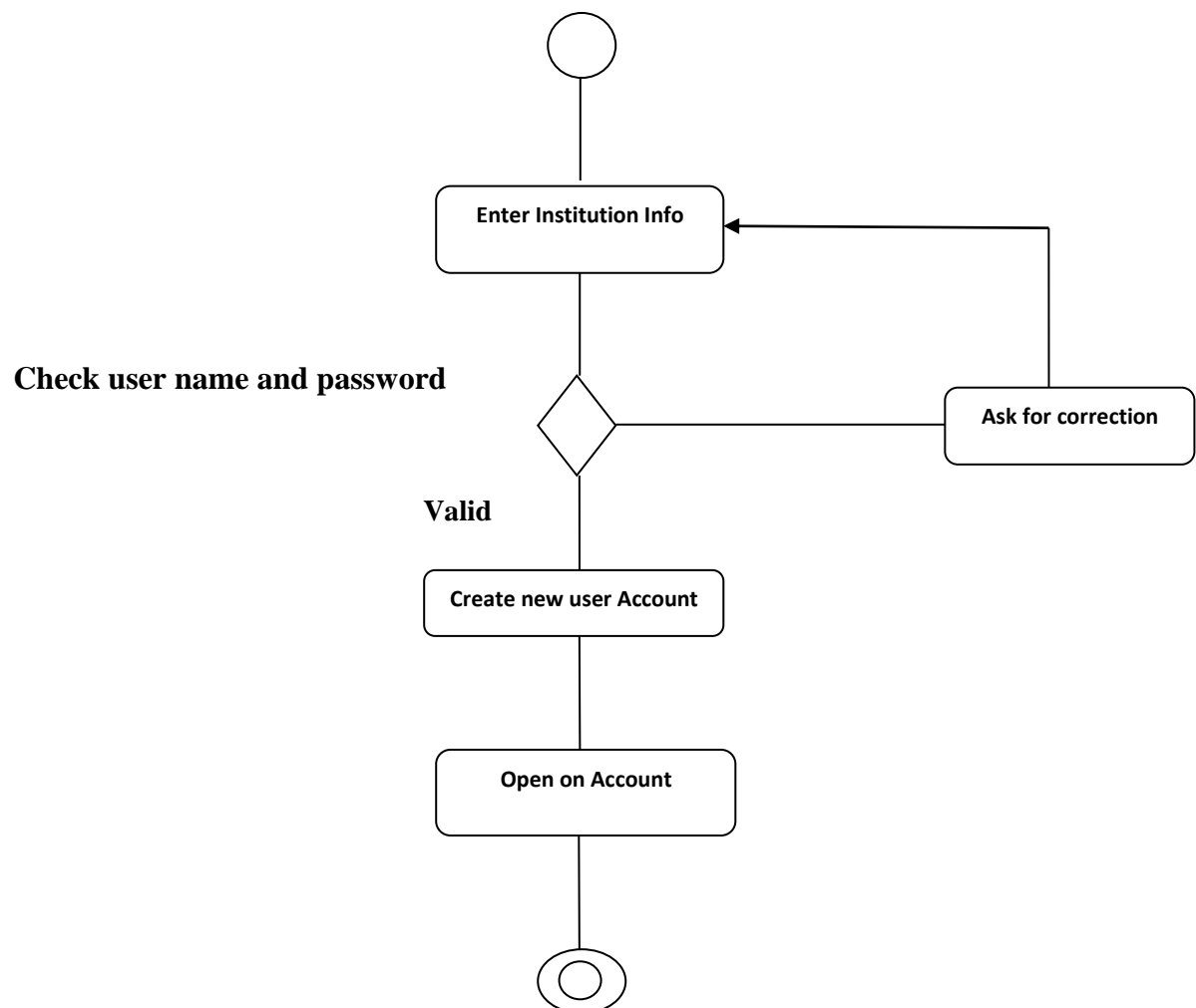


Figure 4.4 Institutions Signup Activity Diagram

AC 2: Institutions Login

Figure 4.5 shows the activity diagram for login into **DLBS** web application.

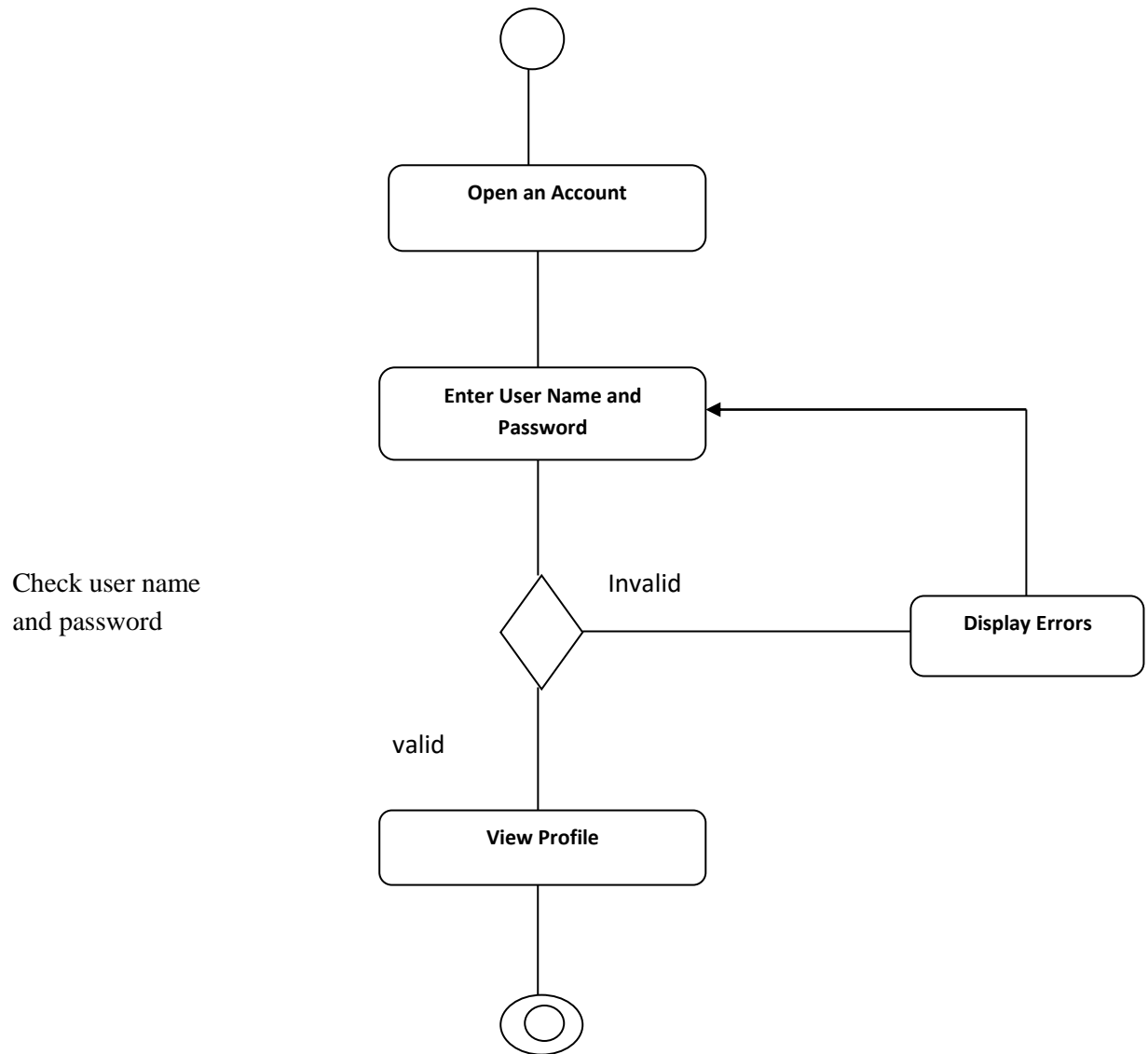


Figure 4.5 Institutions Login Activity Diagram

AC 3: Edit Profile

Figure 4.6 shows the activity diagram for editing schools profile information in **DLBS** web application.

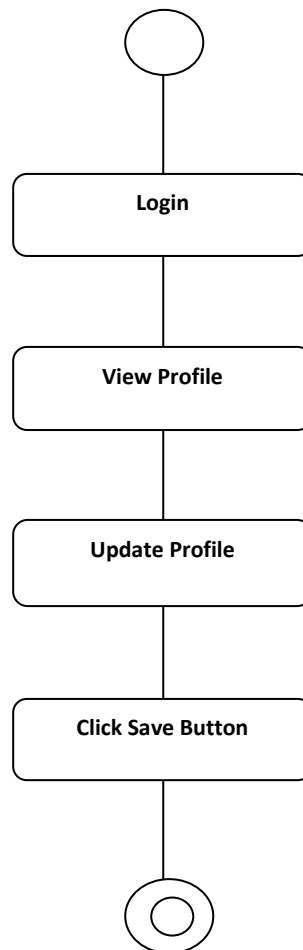


Figure 4.6 Edit Profile Activity Diagram

AC 4: Manage Connection

Figure 4.7 shows the activity diagram for managing Schools' Connection information such as adding new Connection, editing and delete Connection in **DLBS** web application.

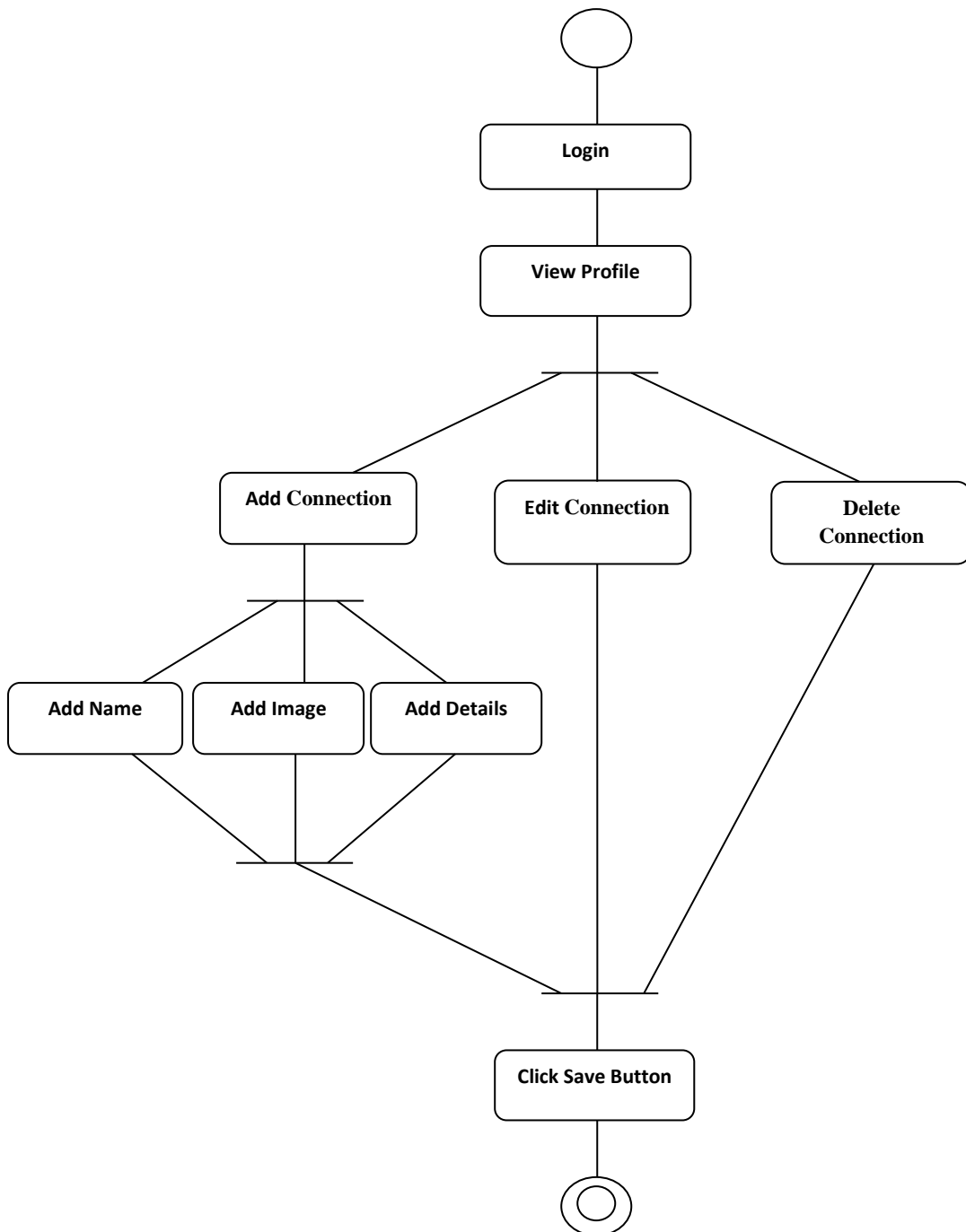


Figure 4.7 Manage Connection Activity Diagram

AC 5: Search

Figure 4.8 shows the activity diagram for search on contacts in schools profile in **DLBS** web application.

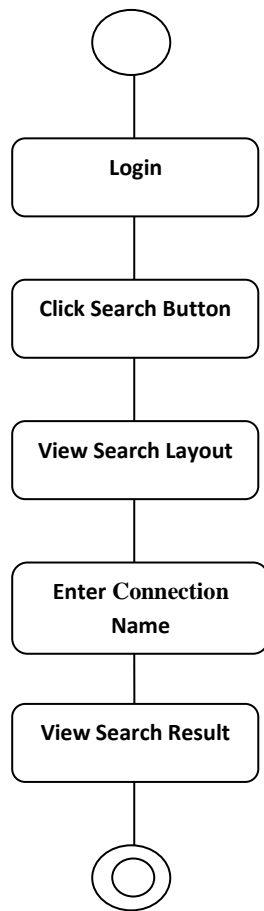


Figure 4.8 Search by Name Activity Diagram

□ Activity Diagrams for “Parent” DLBS Android System

AC 1: Login

Figure 4.9 shows the activity diagram for login into **DLBS** android application for the first time after installing it.

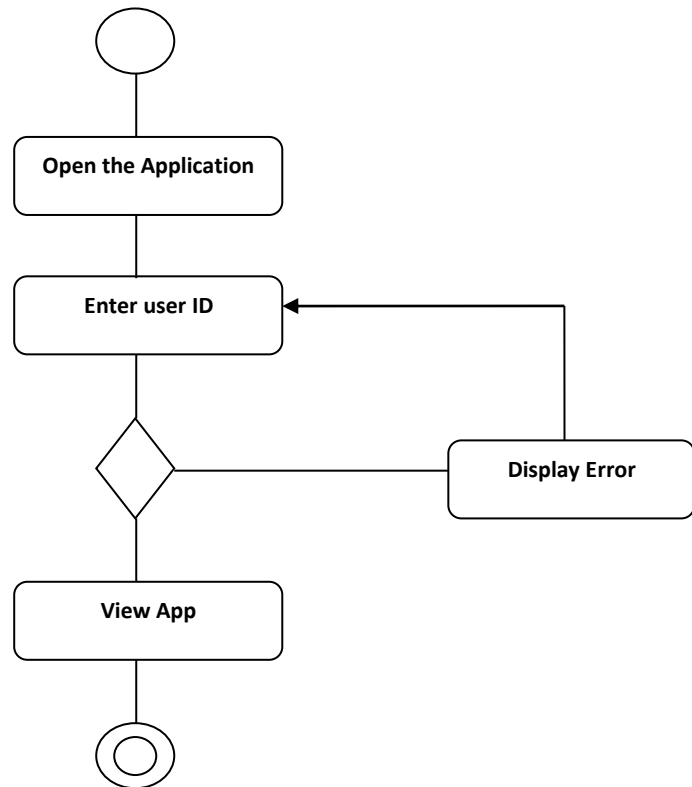


Figure 4.9 Login into Application Activity Diagram

AC 2: View School Profile

Figure 4.10 shows the activity diagram for viewing school's profiles after login into app.

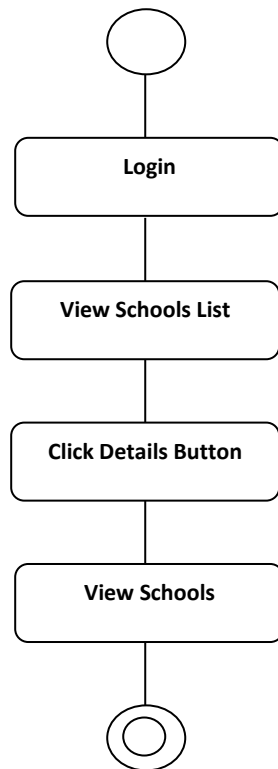


Figure 4.10 View school Profile Activity Diagram

AC 3: View Connection

Figure 4.11 shows the activity diagram for main purpose of creation **DLBS** application in viewing Connection in school's profiles after login into app.

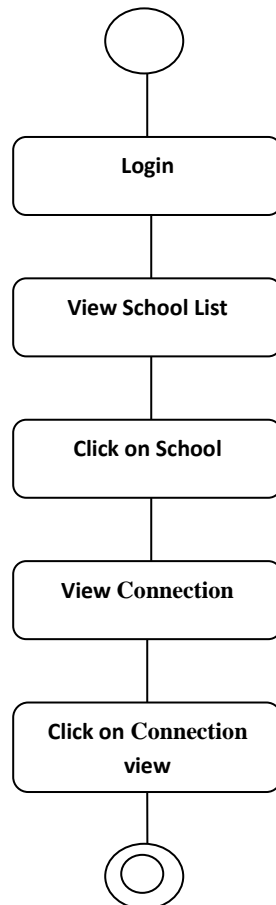


Figure 4.11 View Connection Activity Diagram

AC 4: Search

Figure 4.12 shows activity diagram of normal path to web user for searching about Connection by entering Connection name, phone number or by class in search view then view search result layout.

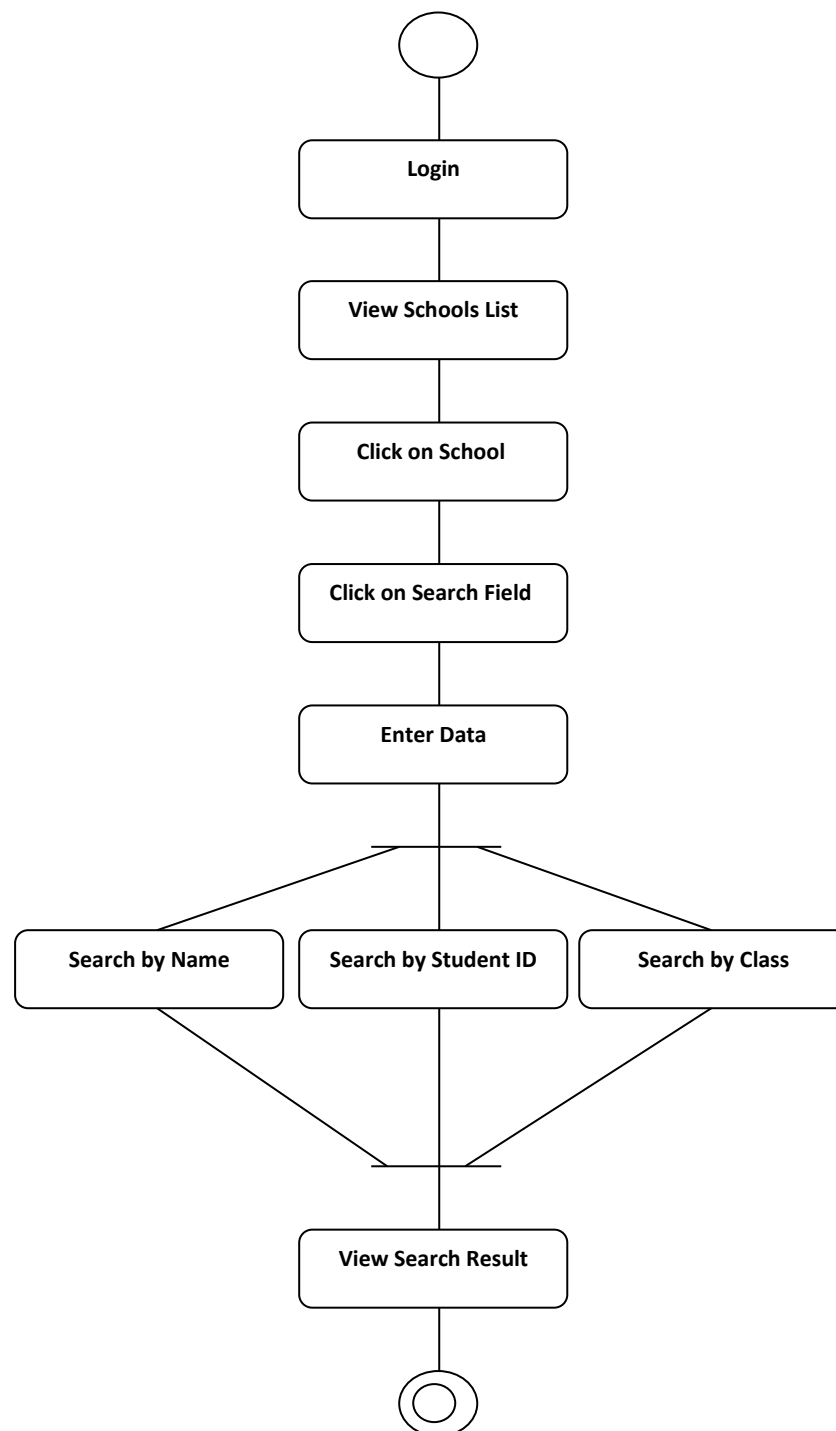


Figure 4.12 Search Connection Activity Diagram

□ Activity Diagrams for “Administration” DLBS Web System

AC1: Admin Login

Figure 4.13 shows activity diagram of login into admin control panel to manage web application.

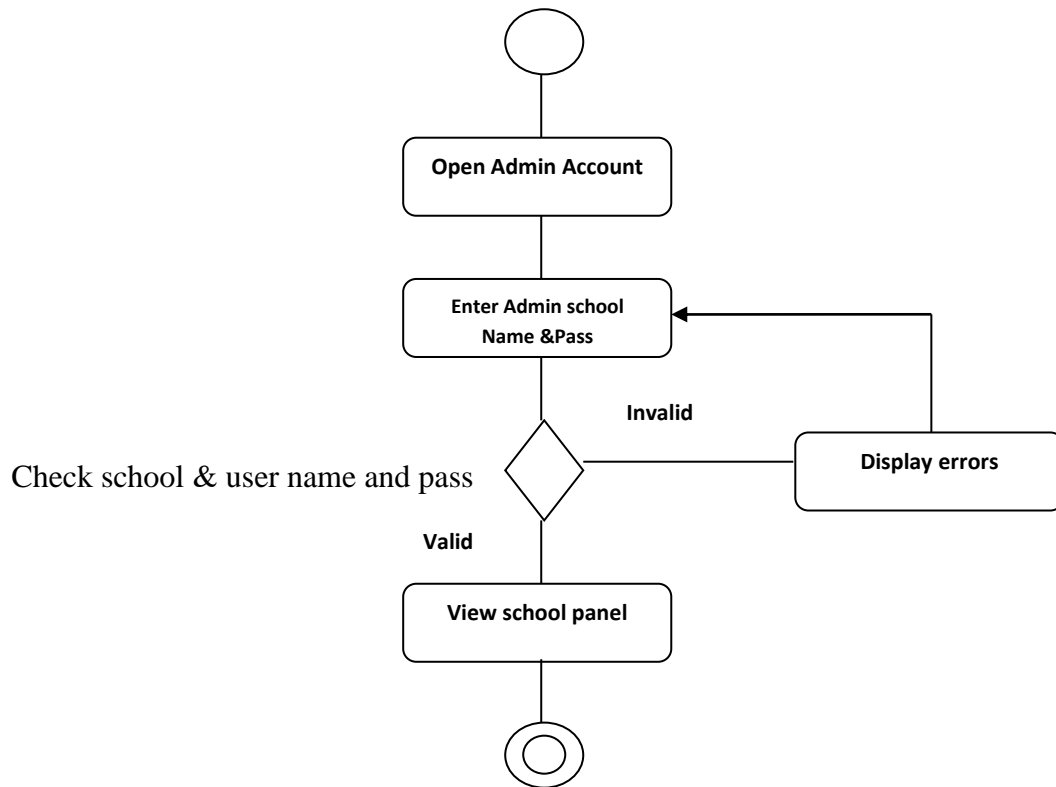


Figure 4.13 Admin Login Activity Diagram

AC 2: Edit Schools Information

Figure 4.14 shows activity diagram of editing schools profiles to changing their information which will update database information.

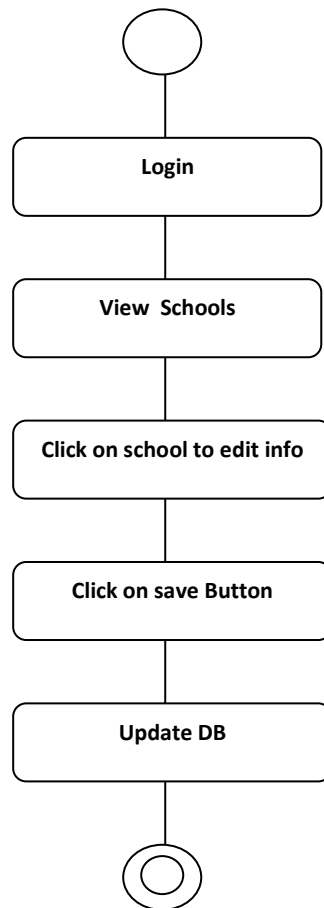


Figure 4.14 Edit Schools Details Activity Diagram

AC 3: Manage Schools Connection

Figure 4.15 shows activity diagram of managing Connection by viewing, editing and deleting Connection .

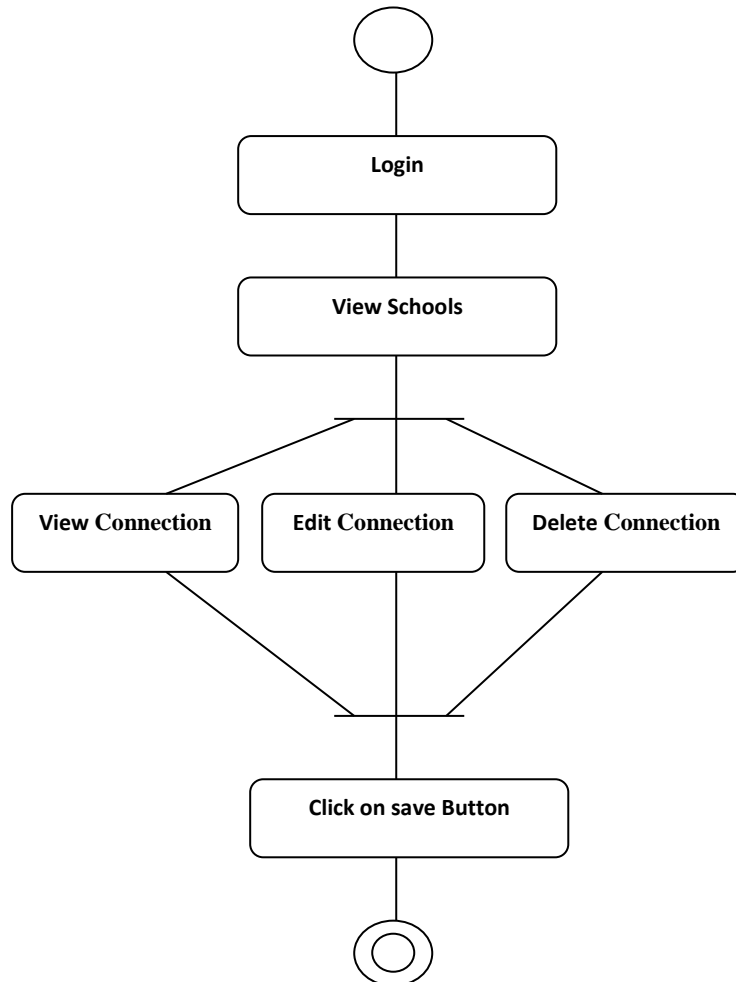


Figure 4.15 Manage Schools Connection Activity Diagram

AC 4: Delete Schools

Figure 4.16 shows activity diagram of deleting school profile as whole permanently which will update database information.

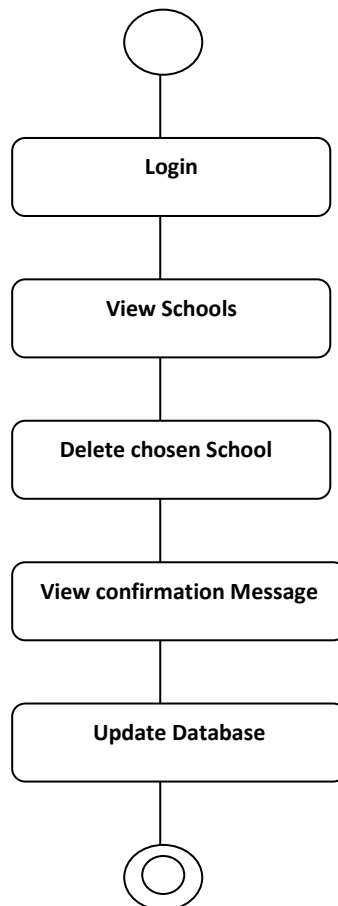


Figure 4.16 Delete Schools Activity Diagram

Chapter 5

Design and Implementation

5.1 Introduction

This part is concerned with design stage activities like: CRC design, System architecture, entity relationship diagram, and user's interfaces. After all design stages complete implementation phase extreme DLBSS coding starting using development tools .

5.2 System Design

System design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. After specified all requirements extreme design relies on test driven development, which design phase still under users test to reach desired design. After well understood of requirements DLBSS design starting from CRC designs which explain main classes and their responsibilities and collaborators, after that system architecture designed for all DLBSS components until reaching design of user interfaces that frequently changing under users testing.

5.2.1 System Architecture

A system architecture is the conceptual model that defines the structure, behavior, and more views of a system. [12]. A system architecture can comprise system components, the externally visible properties of those components, the relationships (e.g. the behavior) between them. It can provide a plan from which products can be procured, and systems developed, that will work together to implement the overall system. Figure 5.1 illustrates DLBS System Architecture which consist of web application connect to database which stores all input data to viewing it in mobile application. Also shown in Figure A1 as a tiers architecture.

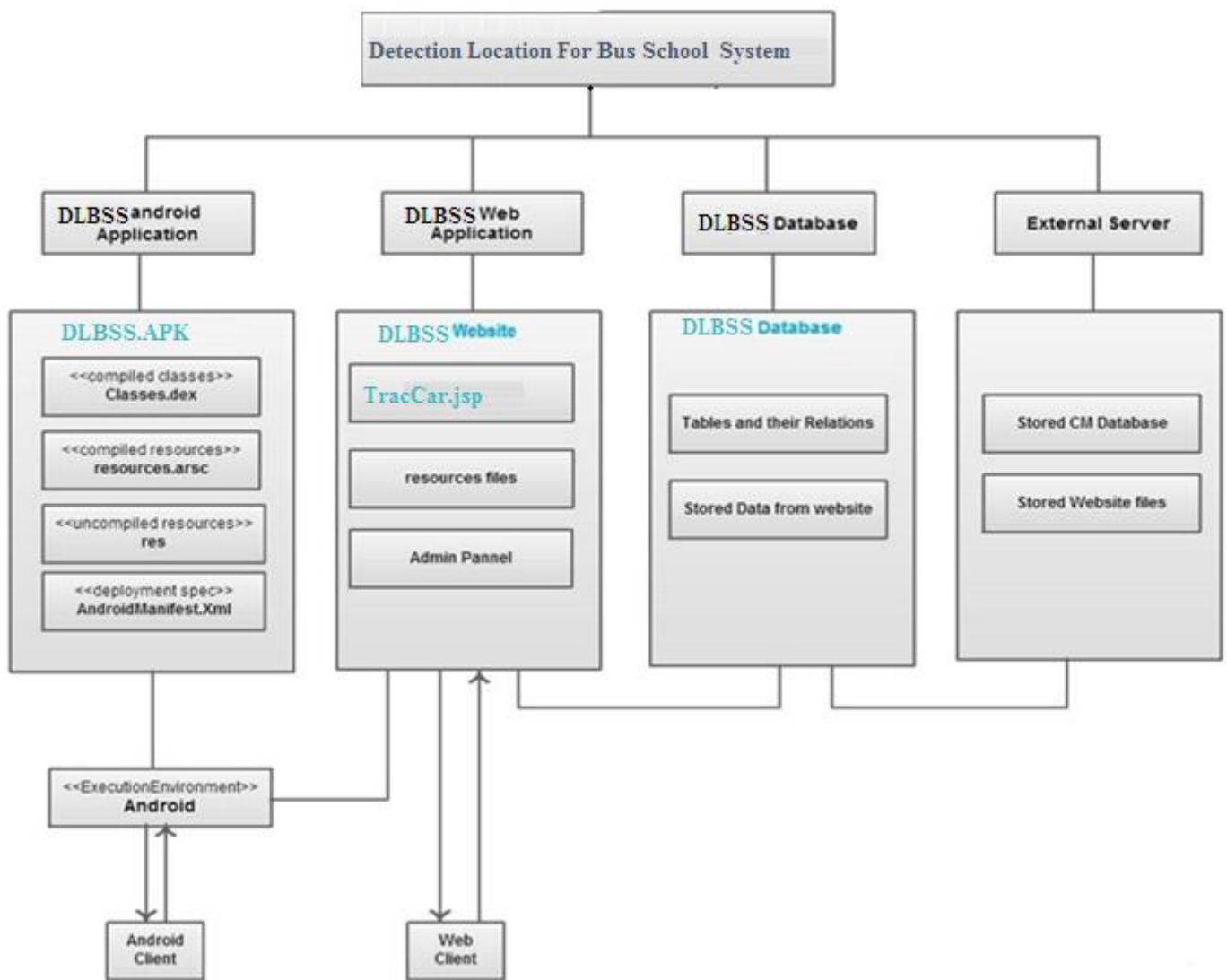


Figure 5.1 Detection Location For Bus School System Architecture

To Detect Location For Bus School System need many of parts of architecture. A shuttle bus may provide a good mean of transportation. However, a person using the shuttle bus often faces the decision of whether it would be quicker to wait for the next bus or to use an alternative mean of transportation (such as bus) to reach his destination. Many passengers are often late to work, students are late for classes because they decide to wait for the bus instead of just simply using an alternate way. The tracking system systems developed in this project will be installed on the buses that contain GPS data of each bus's location. The collected data will be sent to the server using GPRS. An android application or a webpage will be developed to show a map which determines where exactly the bus. The server processed the data collected from the mobile application. The server was connected directly with My SQL database. A webpage was developed to read the stored data inside the database. Consequently, the location of the bus was shown on a map.

5.2.2 Entity Relationship Diagram

Entity Relationship Diagram (ERD) is very important. And the first step in designing database after understanding requirements well, we designed the ERD that which leads to good mapping.

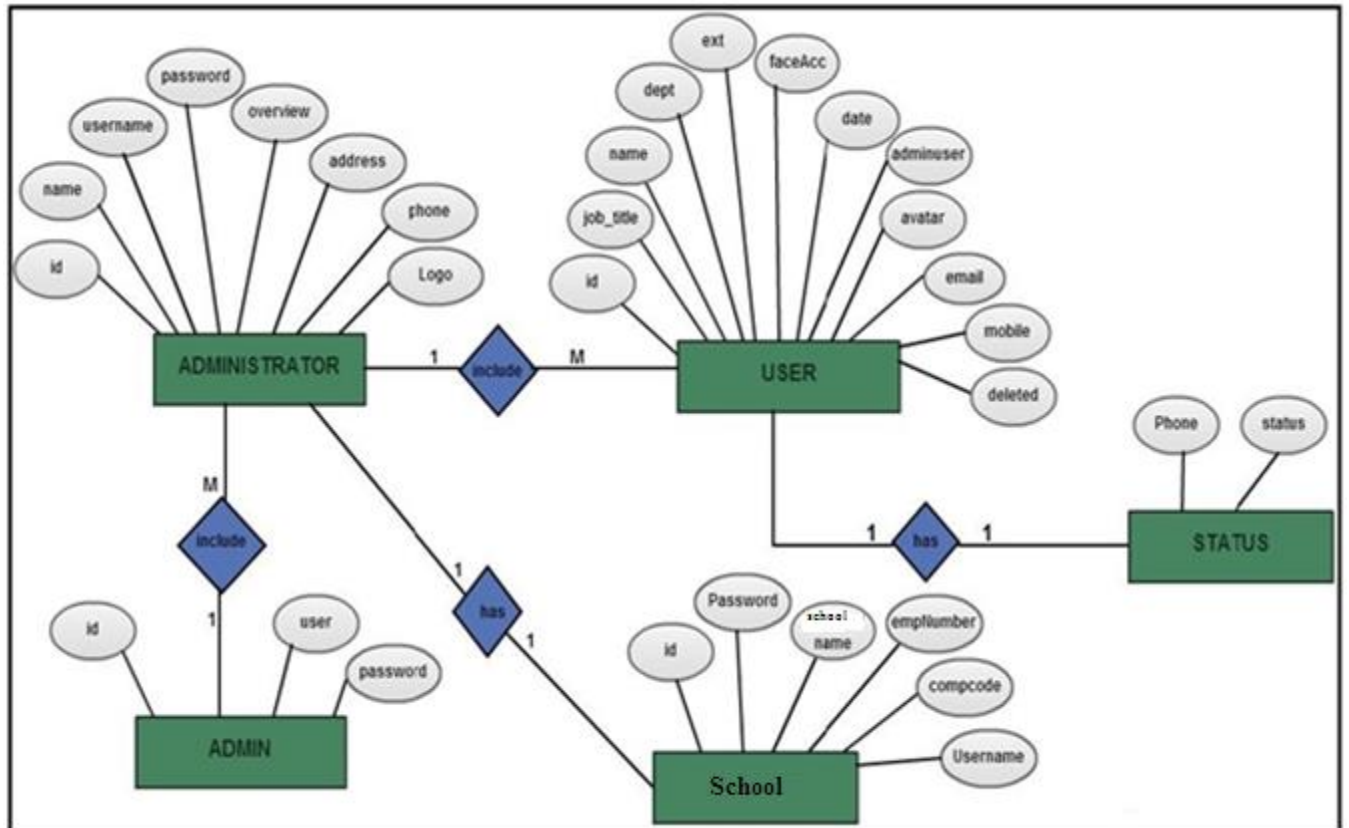


Figure 5.2 Location For Bus School System Entity Relationship Diagram (ERD)

5.2.3 Graphical User Interfaces

This section shows graphical users interfaces (GUI) of DLBS system, which we much care in designing there in web and mobile applications to be a good interfaces ,that allows the users to carry out their intended actions efficiently and effectively, without causing too much of a distractions.

5.2.3.1 Detection Location For Bus School Web Application GUI:

This part shows graphical interfaces to Detection Location For Bus School web application which include Bus School as the following.

➤ Home Page

Figure 5.3 shows Home page of Detection Location For Bus School website

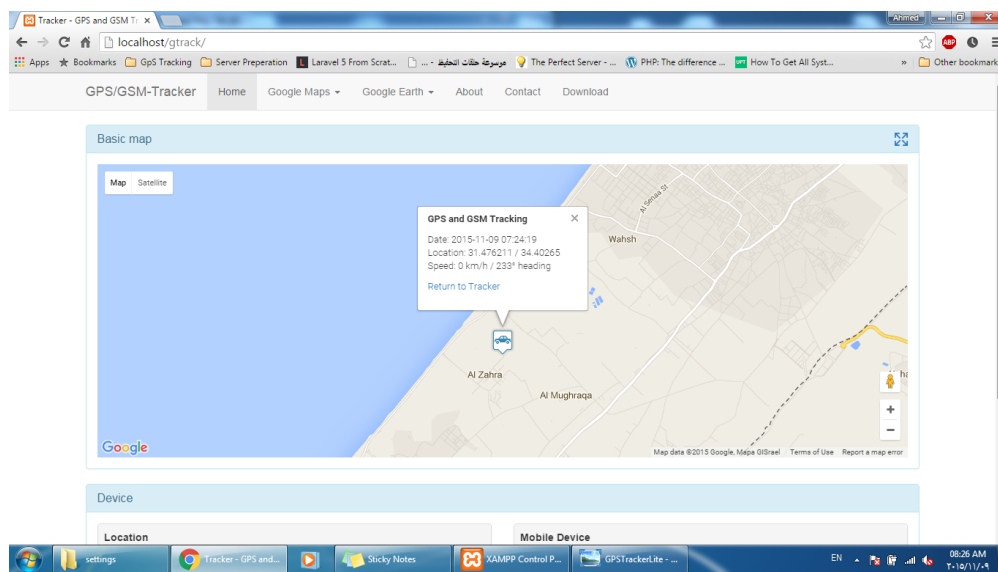


Figure 5.3 Detection Location For Bus School Website Home Page

➤ View School Profile

Figure 5.4 shows School profile .

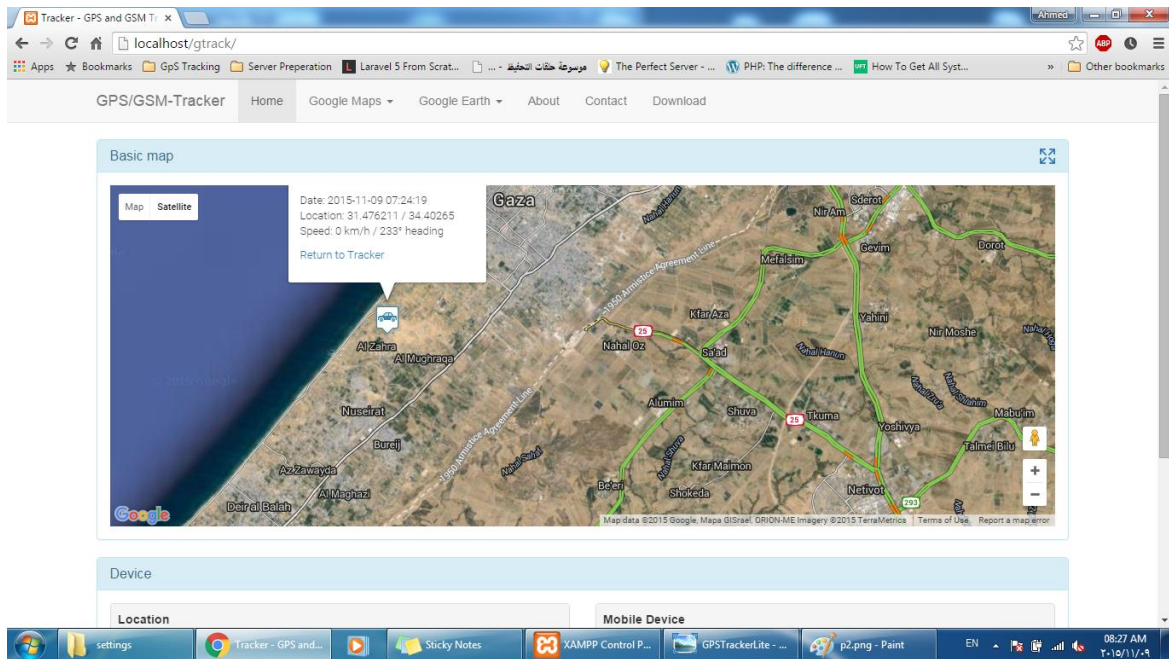


Figure 5.4 School View Profile

5.2.3.2 Detection Location For Bus School mobile Application GUI:

□ Login into Application

Figure 5. 5 shows login into Detection Location For Bus School mobile application.

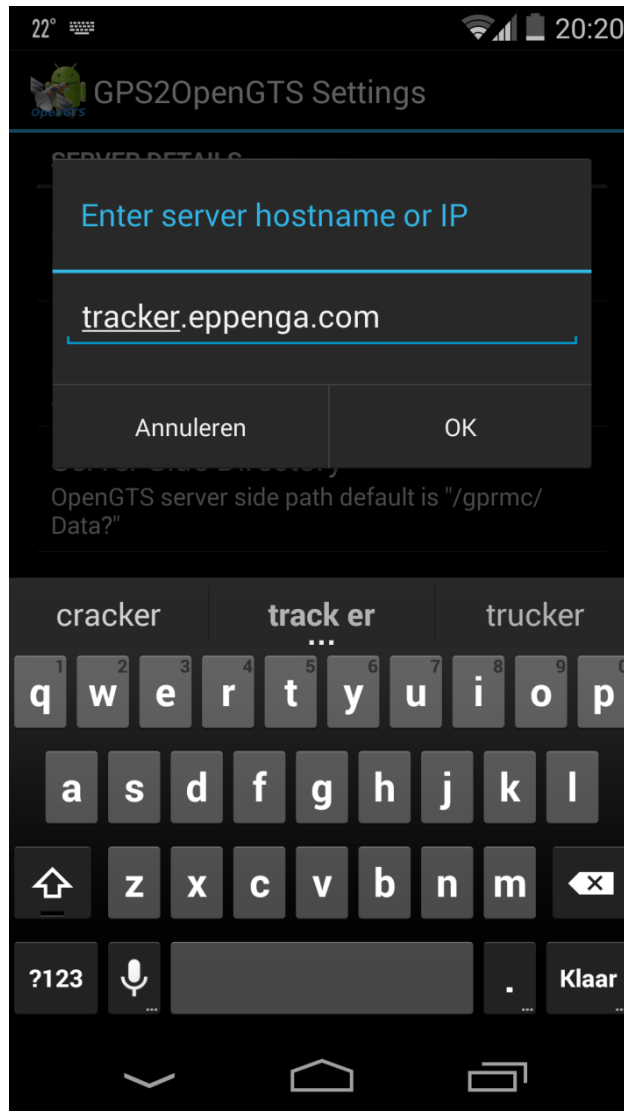


Figure 5. 5 Detection Location For Bus School Mobile App Login

□ View School ID

Figure 5.6 shows view list of School on DLBS mobile application as unit ID.

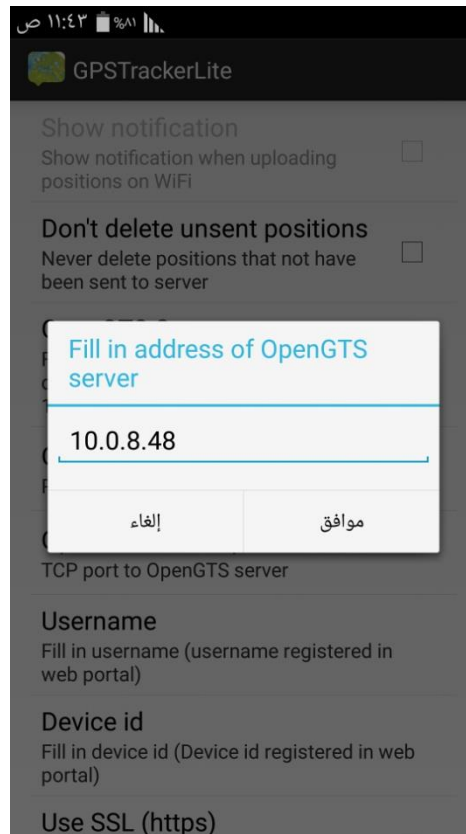


Figure 5.6 View School ID as Mobile ID.

□ View Contacts position.

Figure 5.7 shows view Drivers School bus position after click on Drivers School bus every x meter .

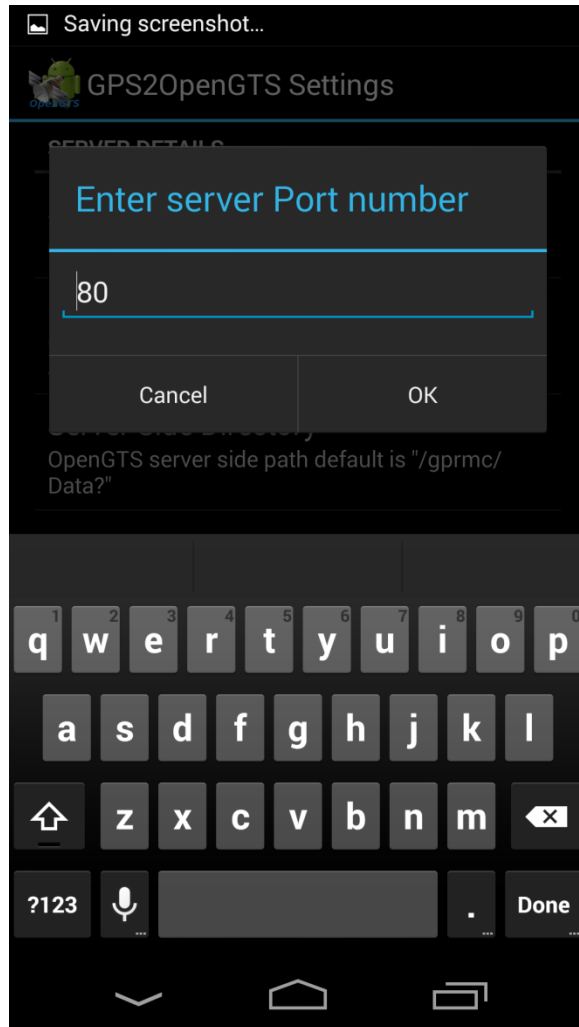


Figure 5.7 View Drivers School bus position

□ View connection Details And Status

Figure 5.8 shows location provider include information and status after click one of the view.

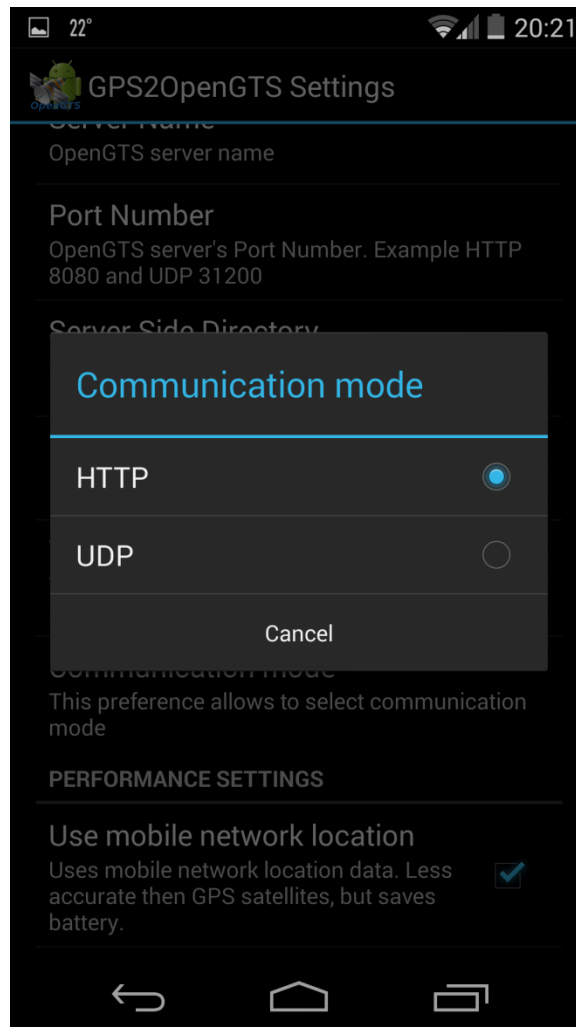


Figure 5.8 View connection Details and location provider

□ Options on location provider Mobile Number

Figure 5.9 shows actions on location provider's mobile number.

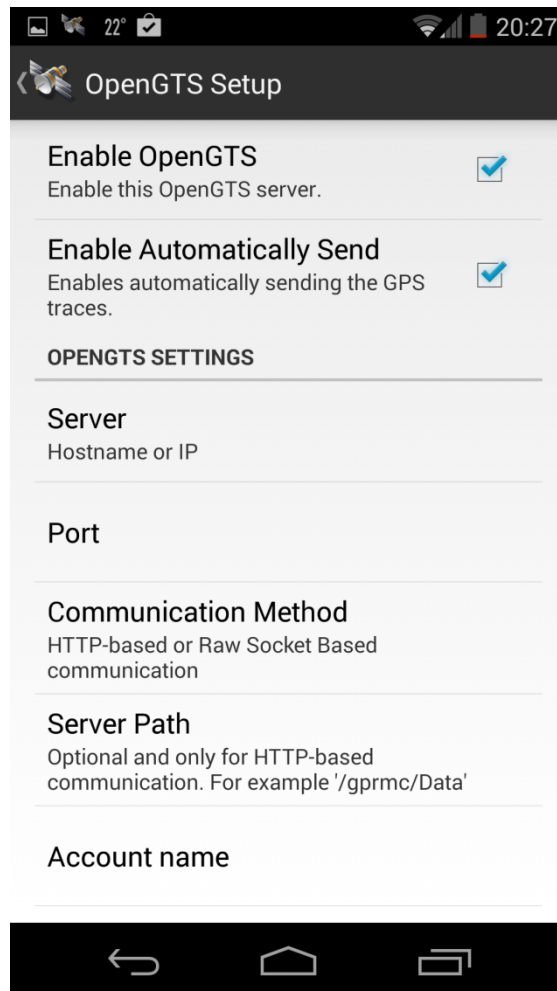


Figure 5.9 Options on location provider

☐ Send Messages to connection

Figure 5.10 shows sending messages to Server.

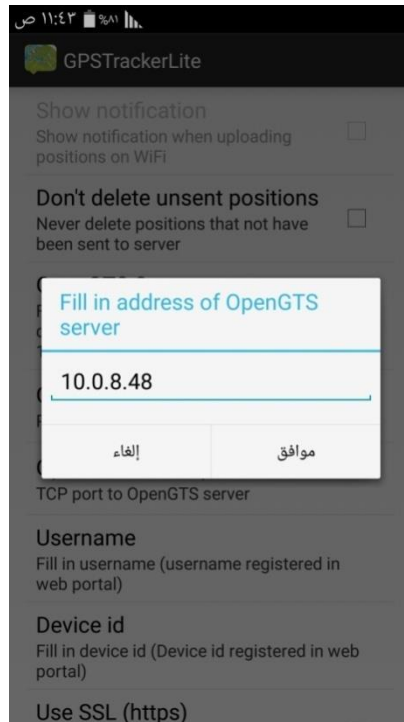


Figure 5.10 Send Messages to server as location provider.

□ Search

Figure 5.12 shows search on bus driver's bus by enter bus ID name or department and view result.



Figure 5.12 Search on driver's bus

5.4 Implementation

The implementation phase takes the requirements, designs phase product, and implements them using appropriate technologies. In the case of validation testing, it is during this phase that test cases are completed and automated in preparation for maintenance. Typically, extensive testing on the early system versions is also performed during this phase, not only to validate the system, but to validate that there are no problems with the test cases themselves. A program written based on final design. A piece of code is written for every module and checked for the output. We will use the Java for Android to develop the software and PHP for developing website. The phases must match between the requirements and the output of the application to determine the verification for it. As mentioned, the implementation language will be Android Java and PHP because mostly Android and web applications are written in it.

□ Development Tools

The following tools have been used to develop the system

- **My SQL**

The tool is the database where all information/data related to requests, records and logs is stored.

- **APPSERV**

APPSERV is an open source tool for Windows with Apache, My SQL, PHP and other additions, in which these applications are configured automatically, allowing us to run a full web server. As extra features PHP My Admin to manage My SQL.

Chapter6

Testing and Evaluation

6.1 Testing

“Software testing is more than just error detection; testing software is operation of the software under controlled conditions, to (1) verify that it behaves “as specified”; (2) to detect errors, and (3) to validate that what has been specified is what the user actually wanted.” [13]

1. Verification is the checking or testing of items, including software, for conformance and consistency by evaluating the results against pre-specified requirements.

[Verified: Are we building the system right?]

2. Error Detection: Testing should intentionally attempt to make things go wrong to determine if things happen when they should not or things do not happen when they should.

3. Validation looks at the system correctness, i.e., the process of checking that has been specified is what the user actually wanted. [Validation: Are we building the right system?]

In other words, validation checks to see if we are building what the customer wants/needs, and verification checks to see if we are building that system correctly. Both verification and validation are necessary, but are different components of any testing activity.

□ Purpose of Testing

“There are two fundamental purposes of testing: verifying procurement specifications and managing risk. First, testing is about verifying that what is specified is what is delivered; it verifies that the product (system) meets the functional, performance, design, and implementation requirements identified in the procurement specifications. Second, testing is about managing risk for both the acquiring agency and the system’s vendor/developer/ integrator. The testing program is used to identify when the work has been “completed,” so the contract is closed, the vendor is paid, and the system is shifted by the agency into the warranty and maintenance phase of the project.”[14]

□ Importance of Testing

A good testing program is a tool for both the agency and the Integrator/supplier; it typically identifies the end of the “development” phase of the project, establishes the criteria for project acceptance, and establishes the start of the warranty period. [15]

6.1.1 Test Environment

Mobile applications are first tested within the development environment using emulators and later subjected to real device testing. Emulators provide an inexpensive way to test applications on mobile phones. The following tools that used for test environment our Android project.

• Real Devices

DLBSS experimented by running on a real devices for android application devices like Sony, Samsung, HTC and LG are used, and web application tested using different computers with different operating systems like windows, MAC OS. Testing on real handsets gives reliable and accurate results, gives interoperability testing because performed on a live network and provide UX user experience by end users.

• Emulators

Mobile emulators help us test our project on different devices without having to actually have them on hand. These technologies serve as virtual pieces of hardware that operate on a PC or laptop. By emulator, we can choose the sizes and OS versions, or even modules to test. And verify certain functionality that is not specific to any device, carrier or operating system.

▪ DLBS Web Application Checklist Testing

For DLBS web application, checklist is split into four different fields:

1. **Functionality.** These are characteristics that including links, forms, and data verification and validation.
2. **Data Fields.** Which describing data integration, data field checks and numeric or alphanumeric fields.
3. **Interface and Error Handling.** This characteristics are specialize in server, external and internal interfaces.
4. **Compatibility and User Interface.** This characteristics describing compatibility of application with different hardware and software requirements which lead to descript suite criteria's of user interface and its components such as colours ,images ,fonts ,content ,instructions and usability.

1. Functionality Checks

#	Description	YES/	Remarks
NO?			
1.1	Does the link takes you to the page it said it would?	Y/N	Y
1.2	Is there pages that have no links to it?	Y/N	N
1.3	Are all referenced web sites or email addresses hyperlinked?	Y/N	Y
1.4	Does the website accept of invalid input?	Y/N	N
1.5	Does the website contains optional and mandatory fields?	Y/N	Y
1.6	Does website fields allow input more than allowed?	Y/N	N
1.7	Default values on page load and terms and conditions abled.	Y/N	Y
1.8	Does a scrollbar appear if required?	Y/N	Y
1.9	Is the Privacy Policy clearly defined and available for user access?	Y/N	Y
1.10	The website work normally (show errors) when entering invalid data.	Y/N	Y
1.11	If user delete cookies, the website open in normal way.	Y/N	Y

Table 6.1 Web App Functionality Checks

2. Data Fields Checks

NO?	Description	YES/	Remarks
2.1	All fields lengths truly as designed and no accepting of truncated characters?	Y/N	Y
2.2	Does entered data is saved to the database and value gets saved fully to the database. (i.e.) Beware of truncation (of strings) and rounding of numeric values.	Y/N	Y
2.3	Does leap years are validated correctly & do not cause errors/miscalculations?	Y/N	Y
2.4	Does numbers of days & months validated & do not cause errors/miscalculations?	Y/N	Y
2.5	Does Lowest and highest values are handled correctly?	Y/N	Y
2.6	Does numeric fields with a blank in position are processed?	Y/N	Y
2.7	Does that both + and - values are correctly processed?	Y/N	Y
2.8	Does system handling correctly with invalid characters & symbols by error messaging?	Y/N	Y

Table 6.2 Web App Data Fields Checks

3. Interface and Error Handling Checks

# NO?	Description	YES/ NO?	Remarks
3.1	Verify that communication is done correctly, web server-application server, application server- database server and vice versa	Y/N	Y
3.2	Compatibility of server software, hardware, network connections	Y/N	Y
3.3	Have all supported browsers been tested?	Y/N	Y
3.4	Have all error conditions related to external interfaces been tested when external application is unavailable or server inaccessible?	Y/N	Y
3.5	If the site uses plug-ins, can the site still be used without them?	Y/N	Y
3.6	Can users use copy/paste functionality?	Y/N	Y
3.7	Does copy/paste functionality allowed in password/CVV/credit card no field?	Y/N	N
3.8	If the system does crash, are the re-start and recovery mechanisms efficient and reliable?	Y/N	Y
3.9	If we leave the site in the middle of a task does it cancel?	Y/N	Y
3.10	If we lose our Internet connection does the transaction cancel?	Y/N	Y
3.11	Does our solution handle browser crashes?	Y/N	Y
3.12	Does our solution handle network failures between Web site and application servers?	Y/N	Y

Table 6.3 Web App Interface And Error Handling Checks

4. Compatibility and User Interface Checks

NO?	Description	YES/	Remarks
4.1	Is the PHP version being used compatible with appropriate browser versions ?	Y/N	Y
4.2	Do images display correctly with browsers under test?	Y/N	Y
4.3	Verify the fonts are usable on any of the browsers	Y/N	Y
4.4	Is Java Code/Scripts usable by the browsers under test?	Y/N	Y
4.5	Does the site load quickly enough in the viewer's browser within 8 Seconds?	Y/N	Y
4.6	Are the field backgrounds the correct color?	Y/N	Y
4.7	Are the field prompts the correct color?	Y/N	Y
4.8	Are the screen and field colors adjusted correctly for non-editable mode?	Y/N	Y
4.9	Does the site use (approximately) standard link colors?	Y/N	Y
4.10	Are all the buttons are in standard format and size?	Y/N	Y
4.11	Is the general screen background the correct color?	Y/N	Y
4.12	Is the page background (color) distraction free?	Y/N	Y
4.13	Are all the screen prompts specified in the correct screen font?	Y/N	Y
4.14	Is all text properly aligned?	Y/N	Y

4.15	Are all graphics properly aligned?	Y/N	Y
4.16	Are graphics being used the most efficient use of file size?	Y/N	Y
4.17	Are graphics optimized for quick downloads?	Y/N	Y
4.18	Are command buttons has similar size and shape, and same font & font size?	Y/N	Y
4.19	Does Banner style & size & display exact same as existing windows?	Y/N	Y
4.20	Does text wrap properly around pictures/graphics?	Y/N	Y
4.21	Is it visually consistent even without graphics?	Y/N	Y
4.22	Is all the error message text spelt correctly on this screen?	Y/N	Y
4.23	Is there Micro help text(i.e. tool tip) for every enabled field & button	Y/N	N
4.24	Can all screens accessible via buttons on this screen be accessed correctly?	Y/N	Y
4.25	Does a scrollbar appear if required?	Y/N	Y
4.26	Does the Tab Order specified on the screen go in sequence from Top Left to bottom right? This is the default unless otherwise specified.	Y/N	Y

4.27	Is there a link to home on every single page?	Y/N	Y
4.28	On open of tab focus will be on first editable field	Y/N	Y
4.29	When an error message occurs does the focus return to the field in error when the user cancels it?	Y/N	Y
4.30	Are fonts clear to read?	Y/N	Y
4.31	Are names in command button & option box names are not abbreviations.	Y/N	Y
4.32	Can the typical user run the system without frustration?	Y/N	Y
4.33	Do pages print legibly without cutting off text?	Y/N	Y
4.34	Does the site convey a clear sense of its intended audience?	Y/N	Y
4.35	Does the site look good on 640 x 480, 600x800 etc.?	Y/N	Y
4.36	Does the site have a consistent, clearly recognizable "look-&-feel"?	Y/N	Y
4.37	Does User can Login Member Area with both User Name/Email ID?	Y/N	Y
4.38	Does the system provide or facilitate customer service? I.e. responsive, helpful, accurate?	Y/N	Y
4.39	Is all terminology understandable for all of the site's intended users?	Y/N	Y

Table 6.4 Web App Compatibility And User Interface Checks

6.1.4 Web Application Automated Testing

Web testing is focuses on web applications. Complete testing of a web-based system before going live can help address issues before the system is revealed to the public. These issues such as the security of the web application, operating System compatibility and windows application compatibility where required as well as readiness for expected traffic and number of users and the ability to survive a massive spike in user traffic, both of which are related to load testing.

▪ Documented Test Results

✓Browser compatibility :

The website is compatible with all main browser software's tested on it
i.e. Internet Explorer, Chrome, Firefox, Opera and Safari.

✓DLBS Checking :

DLBS should be logical and easy to understand. The spelling errors were checked and corrected. DLBS should be meaningful. Places and sizes of the images and icons were checked.

✓Operating System compatibility :

The website is compatible with all main operating systems such as
windows OS and MAC OS.

✓Functionality testing :

All functions in the application, database connection, and forms used to getting information from website were tested.

✓Database Testing :

Data consistency is very important in web application. Data integrity and errors while editing, deleting, modifying the forms or completing any DB related functionality were checked. All the database queries were checked for correct execution, correct data retrieval, and accurate updates.

✓All activity check :

Activities are the integral part of any Android application. They are used to get information to encourage interaction among users and contacts.

6.2 Maintenance

“Application maintenance is automated in this system for the purpose of correcting faults, improving performance or adapting the system to a new environment. The programmatically implemented software module is tested for the correct output. Bugs and errors are removed at this phase. In the process of testing, a series of tests and test cases are performed to check the module for bugs, faults, and other errors. Erroneous codes are written and tested again until desired output is achieved. The system can be maintained when needed or required as such: (1) A new functionality is added. (2) The software models change. (3) Software must be updated to run on improved hardware or with improved software.”[16]

6.3 Evaluation

After interview Future Schools, Technology Building System (TBS) , University of Palestine, and Link IT in Gaza about DLBSS system mechanisms and benefits many of their managers expressed their satisfaction and acceptance of project, however many of student fathers and Mothers satisfied about system goals which expressed by them as organizer of people queries . (Link IT) CEO manager “Hazem Alasaly” after interview with him affirmed its readiness adopt DLBSS as company directory for their Drivers schools ’s contacts and expressed full acceptance of the system. Some companies added more requirements especially in privacy issue but they give general acceptance of the system, many of questioners has distributed to schools and acceptance ratio got 90%.

Chapter 7

Discussion, Conclusion and Future works

7.1 Introduction

This chapter summarizes discussion about the project and showcases plans for future work. At the end, it gives a conclusion for the project with results accomplished. It provides some important recommendations for developers on the system in the future. The new system has been deployed with so much care that it is free of errors and at the same time efficient and less time-consuming. The system is robust. Also provision is provided for future developments in the system.

7.2 Project Challenges

- ☐ Some of difficulties faced in traditional thinking of depending on public relation or queries school bus as the only way to reach drivers of school.
- ☐ Lack of modern data mobile and Wi-Fi internet access make difficulties to provide more benefits depending on internet connection anywhere.
- ☐ Volatility and Continued of changing of users requirements make some problems.
- ☐ Privacy issues make some confusion for many companies that want their contacts information secure.
- ☐ Some difficulties of continually updating information due to electricity outage.

7.3 Conclusion

Bus schools have suffering with citizens relations which also citizens need to fast communicate with desired student and their parents, Detection Location For Bus School (DLBS) by Android And Web Application system provide optimal solution for this problems by using modern mobile and web technologies that provide fastest and reliable reach.

Finally Detection Location for Bus School system has been developed to facilities all treatments between student and schools which encourage many parents to join in this system as the first choice.

7.4 Future Works

- Our application provides opportunities to facilitate reaching and communicate between business schools and public users, but it requires modern services connection with Wi-Fi network such as 3G and 4G to support more features like sending messages and video calling. For further work, we recommend to make improvements that will enable bus drivers profiling their schools managers, control their contacts information and integrating directly with social sites.
- It will be recommended to make this application working under all platforms such as windows phone and IOS to reach all people and become the first choice for schools to market themselves to wider range of people.
- We hope that our system include all Palestinian schools and become the first directory for all people and interest institutions.
- After spread of our system we intend to make real business by make fees on registration by students parent.

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Evaluation Questionnaire of Detection Location For Bus School System (DLBS)

استبياناه لتقييم نظام " كشف الموقع " DLBS System

السيد ولي أمر الطالب /

السلام عليكم و رحمة الله و بركاته

تهدف هذه الإستبانة إلى معرفة وجهة نظركم و انطباعاتكم عن استخدام برنامج كشف الموقع و هو برنامج يهدف إلى تسهيل التواصل بين أهالي الأمور وإدارة المدارس من خلال تحديد موقع الحافلة المركزية وإرسال رسائل نصية في حالة تغيب أبناءكم بحيث يسهل تواصلكم ومعاملتكم مع المدرسة .

نرجو منكم التفضل بالإجابة عن أسئلة الإستبانة التالية ، علما أن إجاباتكم ستستخدم لغرض البحث العلمي فقط وستكون مساهمتكم في محل الاحترام و التقدير .

وتفضلوا بقبول فائق التقدير و الاحترام

الطلاب :

حنين الزريعي

رنا طبش

نهاد قديح

كلية تكنولوجيا المعلومات

جامعة فلسطين

مدينة الزهراء

استبياناه لتقييم نظام " كشف الموقع " DLBS System

تنقسم هذه الإستبانة إلى قسمين :

القسم الأول يهتم بمعلومات خاصة بالمدرسة :

(1) طبيعة المدرسة :

☐ خاصة ☐ حكومية ☐ وكالة ☐ غير ذلك

(2) خبرة المدرسة واعتماد واستخدام الحاسوب

☐ لا يوجد ☐ أقل من ٣ سنوات ☐ أكثر من ٣ سنوات

(3) وسيلة اتصال المدرسة بالأهالي من خلال

☐ إرسال رسائل جوال ☐ الاتصال عبر الجوال ☐ إرسال إشعار مكتوب مع الطالب

القسم الثاني حول استخدام نظام كشف الموقع DLBS System :

بعد قرائتك للخيارات ضع دائرة حول الرقم المناسب لرأيك :

☐ الدائرة حول الرقم 5 تعني موافق بشدة

☐ الدائرة حول الرقم 4 تعني موافق

☐ الدائرة حول الرقم 3 تعني محايد

☐ الدائرة حول الرقم 2 تعني غير موافق

☐ الدائرة حول الرقم 1 تعني غير موافق بشدة

تهدف هذه المجموعة لمعرفة وجهة نظرك تجاه الفائدة من استخدام نظام DLBS						
1	هل النظام يساعد علي التواصل مع المدرسة					1
2	هل النظام يساعد علي توفير المعلومات اللازمة					1
3	هل النظام يوفر لك الوقت					1
4	هل النظام يوفر لك الجهد					1
تهدف هذه المجموعة لمعرفة وجهة نظرك تجاه سهولة استخدام نظام DLBS						
5	هل النظام سهل الاستخدام					1
6	هل النظام واضح ومفهوم					1
7	هل الاشتراك بالنظام سهل وبسيط					1
8	هل من السهل امتلاك المهارة اللازمة لاستخدام النظام					1
تهدف هذه المجموعة لمعرفة وجهة نظرك تجاه سهولة تعلم استخدام نظام DLBS						
9	هل تعلم استخدام النظام سهل وبسيط					1
10	هل تذكر خطوات استخدام النظام بسهولة					1
11	هل يحتاج النظام لتسهيل استخدامه					1
تهدف هذه المجموعة من الأسئلة لمعرفة الاكتفاء و الرضا لديك اتجاه نظام DLBS						
12	هل الخدمة التي يقدمها النظام كافية					1
13	هل النظام رائع ومجدي					1
14	هل يعمل النظام بالشكل الذي أريده					1
15	هل توصي باستخدام النظام					1

شكراً لحسن تعاونكم معنا ::::::::::::::

Questioner Results

After the distribution of the questionnaire through Detection Location For Bus School system (**DLBS**) on a number of parents and collect the questionnaire and analyzed to determine the feasibility of the system (**DLBS**) as a solution to the problem of parents to determine their children site during the school day it became clear that some should they see appropriate treatment for this problem and others should they see a way to enhance communication with their children. Figure A3 shows questionnaire results of questioned DLBS which explain numbers of school's choices of questionnaire options, Figure A4 shows how extent of acceptance of DLBS System.

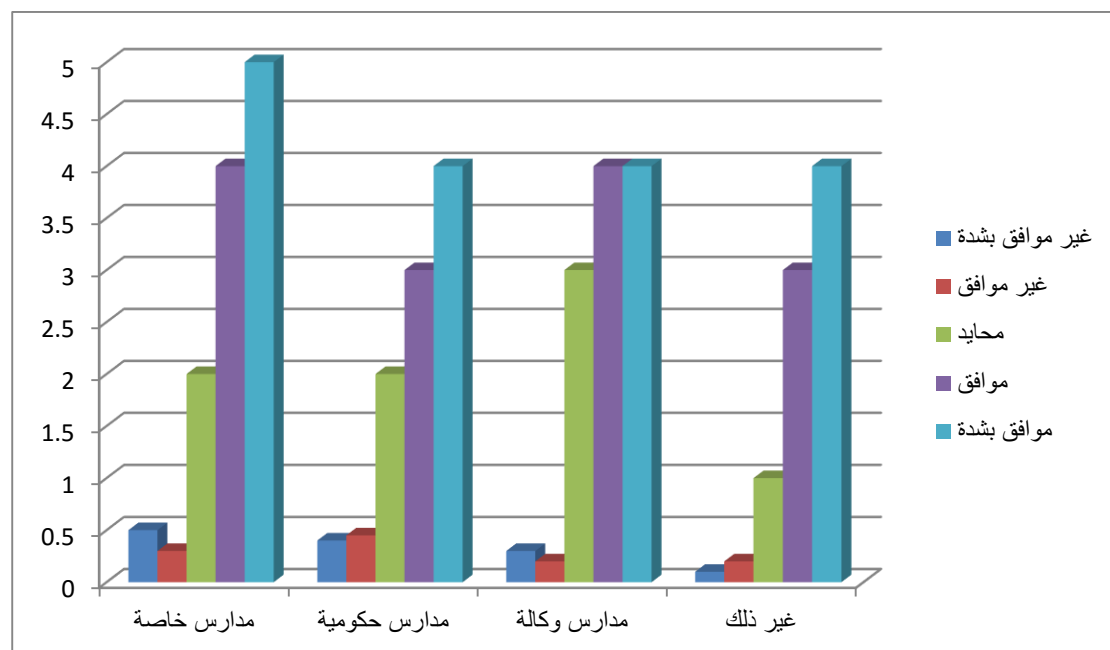


Figure A1 DLBS Questionnaire Result

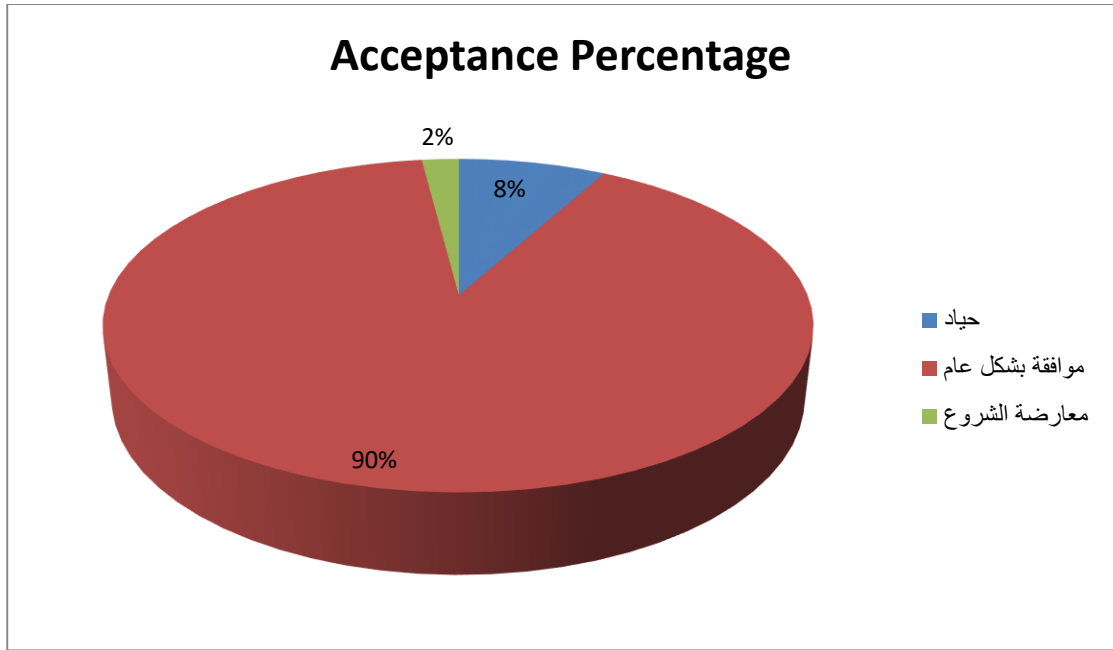


Figure A2 DLBS Acceptance Percentage