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Research Paper

INNOVATIVE ACCESS OF BUS ROUTE AND ITS INFORMATION (TRACKING VIA ANDROID APP)

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Abstract

Today mobile phone which is also nick named as Smartphones have an enormous growth over the mobile market. People throughout the world started using smartphones for their personal and social uses as the phones have created various multi-tasking works. The smartphones simplifies the user's usage of computers and other devices. Smartphone is mainly used as a device of alternate to computers over online. Android is an open source Operating System from Google. Android supports Play Store with numerous Apps(Applications) which is an online software store. The users can download the necessary app from store that is created by a third party. The paper discusses about an App that can be used by private organizations for their transport department. When creating an app the steps to be considered and the database connectivity that is used is framed with necessary practical support. The App that is discussed in the paper is a part of MCA project that has been submitted for Viva Voce. The App is named as BUS ROUTE AND INFO which will available over Play Store very soon as free software.

Keywords: Android OS, Android Apps Development, Bus App.

1. INTRODUCTION

Android is an open source operating system founded by Andy Rubin, Rich Miner, Nick Sears, and Chris White at Palo Alto, California in the year 2003. It is an operating system primarily designed for touch screen smart phones and tablet computers. Android is based on Linux kernel which is developed by Android Inc which was later finally bought by Google in the year 2005. Android phone was first sold in the year 2008. In Android users can customize their home screens with shortcuts to applications and widgets.

Android is open source software under the license of Apache. Android has a large community of developers writing applications which is called as "apps", which is primarily written in JAVA programming language. At 2012 approximately 7,00,000 apps are available over Play Store. Google play is the Android's primary application store has nearly about 45 billion applications for the functionality of Android smart phones.

Android has the advantage of a ready-made, low cost, customizable, light weight operating system for the hand held devices. During the year Nov 2007, the Open Handset Alliance, Consortium which develops open standards for mobile devices. HTC Dream was the first Android mobile to market.

Android as a user interface which is based on direct manipulation, hepatic feedback and also internal hardware's like accelerometers, gyroscopes and proximity sensors. Android versions consist of a kernel based on Linux kernel version 3.X .The versions and code name of Android is given below.

2. VERSIONS IN ANDROID

Code Name	Version	Year of Release
Cupcake	1.5	2009
Donut	2.0 – 2.1	2009
Froyo	2.2	2009
Ginger Bread	2.3 – 2.3.2	2010
Ginger Bread	2.3.3 – 2.3.7	2010
Honey Comb	3.1	2011
Honey Comb	3.2	2011
Ice Cream Sandwich	4.0.3 – 4.0.4	2011

Jelly Bean	4.1 x	2012
Jelly Bean	4.2 x	2012
Jelly Bean	4.3 x	2013
Kit Kat	4.4	2013
Kit Kat	4.4.3	2014
Lollipop	5.0	2014
Lollipop	5.1	2015

3. ANDROID OS ARCHITECTURE

The architecture of the Android OS, which referred as a software stack with different layers. Each layer is a group of several program components. The various layers of Android OS are shown below

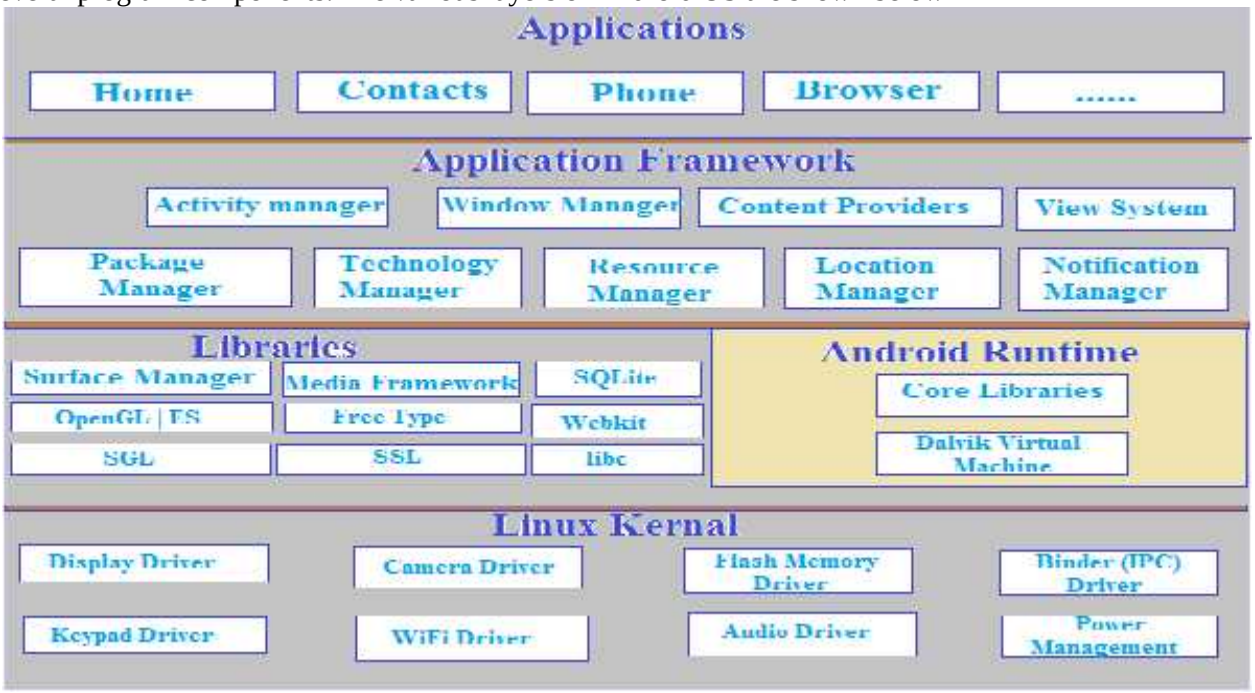

Fig – 1: Android OS Architecture

a. Linux Kernel - Android OS is built on top of the Linux 2.6 Kernel with some architectural changes made by Google. Linux interacts with the hardware.

b. Libraries - Libraries are the Android's native libraries. The device handles different types of data. These libraries are written in C or C++ language.

c. Android Runtime - Android Runtime consists of Dalvik Virtual Machine DVM and Core Java libraries. It is a type of JVM used in android devices.

d. Application Framework - These programs manage the basic functions of phone like resource management, voice call management etc.

e. Applications - Applications are the top layer in the Android architecture. They are SMS client app, Dialler Web browser, Contact manager.

4. ANDROID APPLICATION COMPONENTS

Android Operating System has five types of components to build an application. The behaviour of an application is based on the working nature of these components.

- Activities
- Services
- Content Providers
- Broadcast Receivers

- Intents

Activities

Activity is an individual user interface screen in an Android application where visual elements called Views (also known as widgets) can be placed and the user can perform various actions by interacting with it.

Services

A service is an Android application component that runs in background and has no visual UI. Services are used to perform the processing parts of your application in the background. While the user is working on the foreground UI, services can be used to handle the processes that need to be done in the background. A service can be started by other Android application components such as an activity or other services and it will continue to run in the background even after the user switches to another application. Thus services are less likely to be destroyed by Android system to free resources, than Activities.

Content Providers

Content providers in Android, provide a flexible way to make data available across applications. Suppose creating any type of data in an application and storing it at any storage location, it may be in the data base, file system or in any online storage space. Then through content providers other applications are able to query access or even modify the data created, as long as content provider allows it.

Broadcast Receivers

Broadcast receivers are one of the Android application components that are used to receive messages that are broadcasted by the Android system or other Android applications.

Intents

Actually intents are not one of Android application components; instead it is the component activating mechanism in Android. It constitutes the core message system in Android and defines a message to activate a particular component.

5. APP WORKING FLOW STRUCTURE

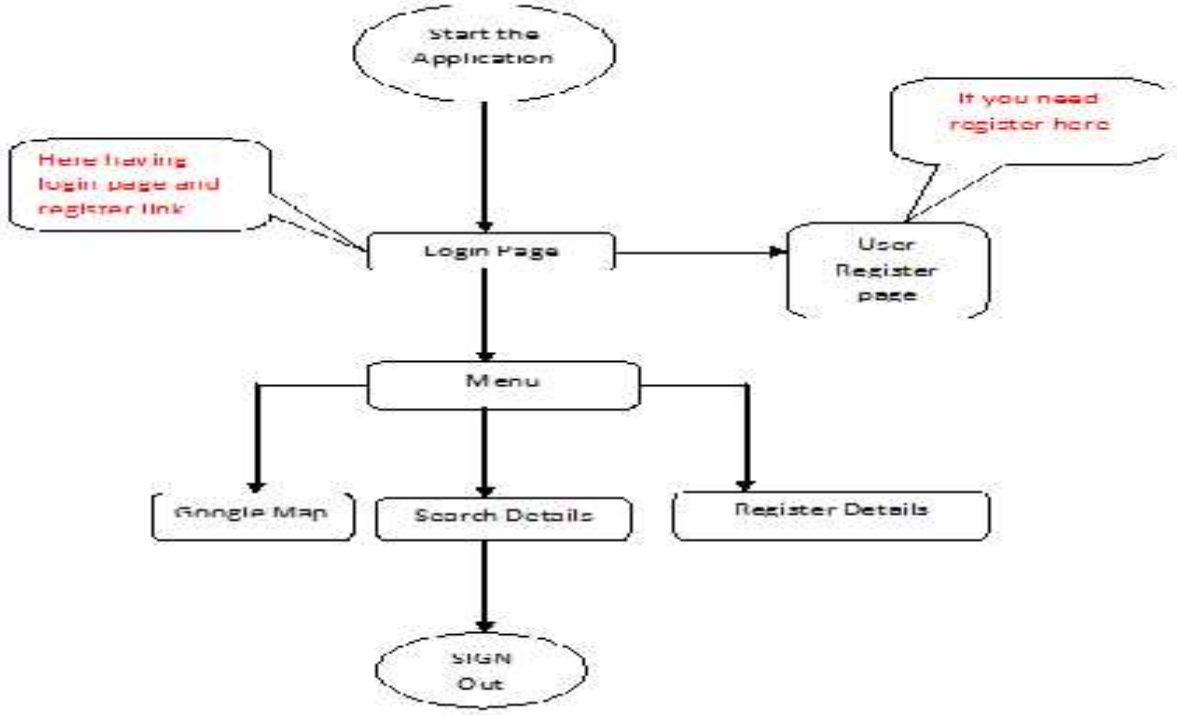

Fig – II : App Flow Structure

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6. SOFTWARE REQUIREMENTS

- Eclipse (IDE)Software
- Android Operating System
- JDK (Java Development Kit)
- Android Development Tool

7. HARDWARE REQUIREMENTS

- Windows System
- Android Mobile Phone

8. SQLite DATABASE IN ANDROID

SQLite database is bundled with Android SDK (Software Development Kit). When the Android SDK is downloaded and installed, the SQLite database is ready to be used.

9. APP FUNCTIONAL STRUCTURE

- **Start Application:** To start the Android Application just touch the application Icon than go to Login page of the Application.
- **Login Page:** In Login page, registered users can input username and password to enter.
- **Register Page: N**ew user you can register thier login.
- **Menu:** It has three main modules
  - ✓ Google Map
  - ✓ Search
  - ✓ View bus details
- **Google Map:** Is easy to find the bus location and root map.
- **Register Details**: Information about new bus and edit the information about existing bus.
- **Search Details:** The information about the buses and thier routes.
- **Sign-Out:** Press Exit Button to logout.

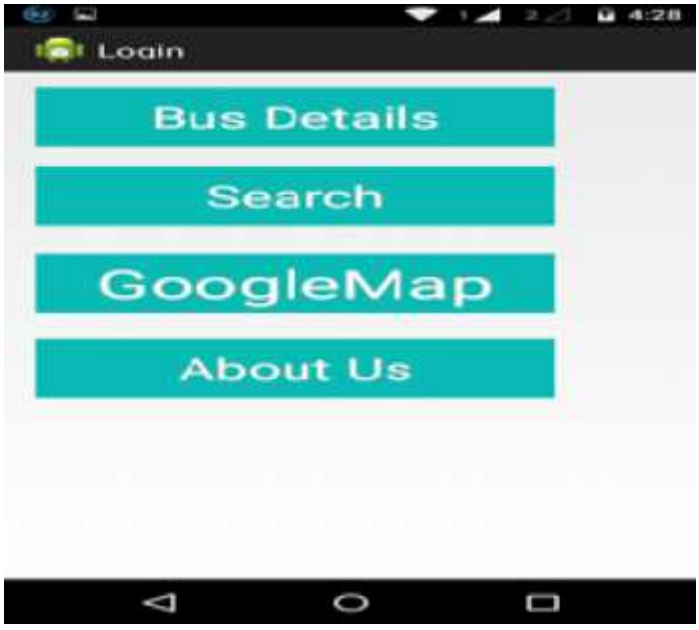

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Fig – V: Bus Details

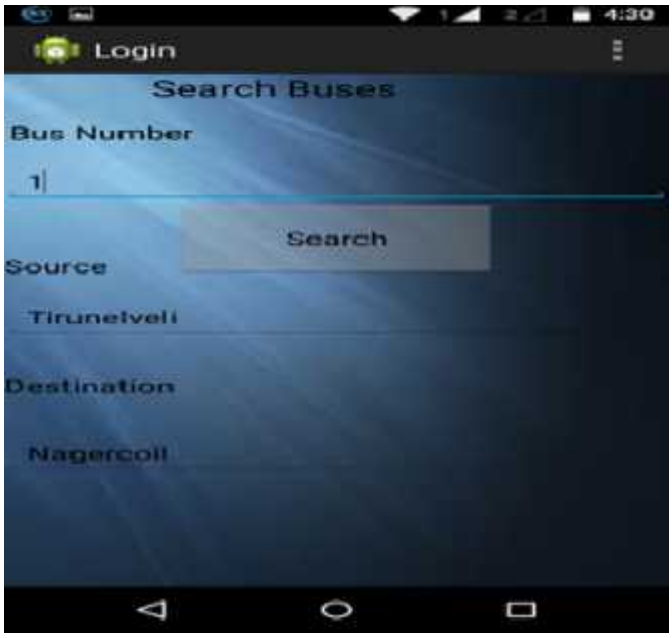

Fig – VI: Bus Search Page

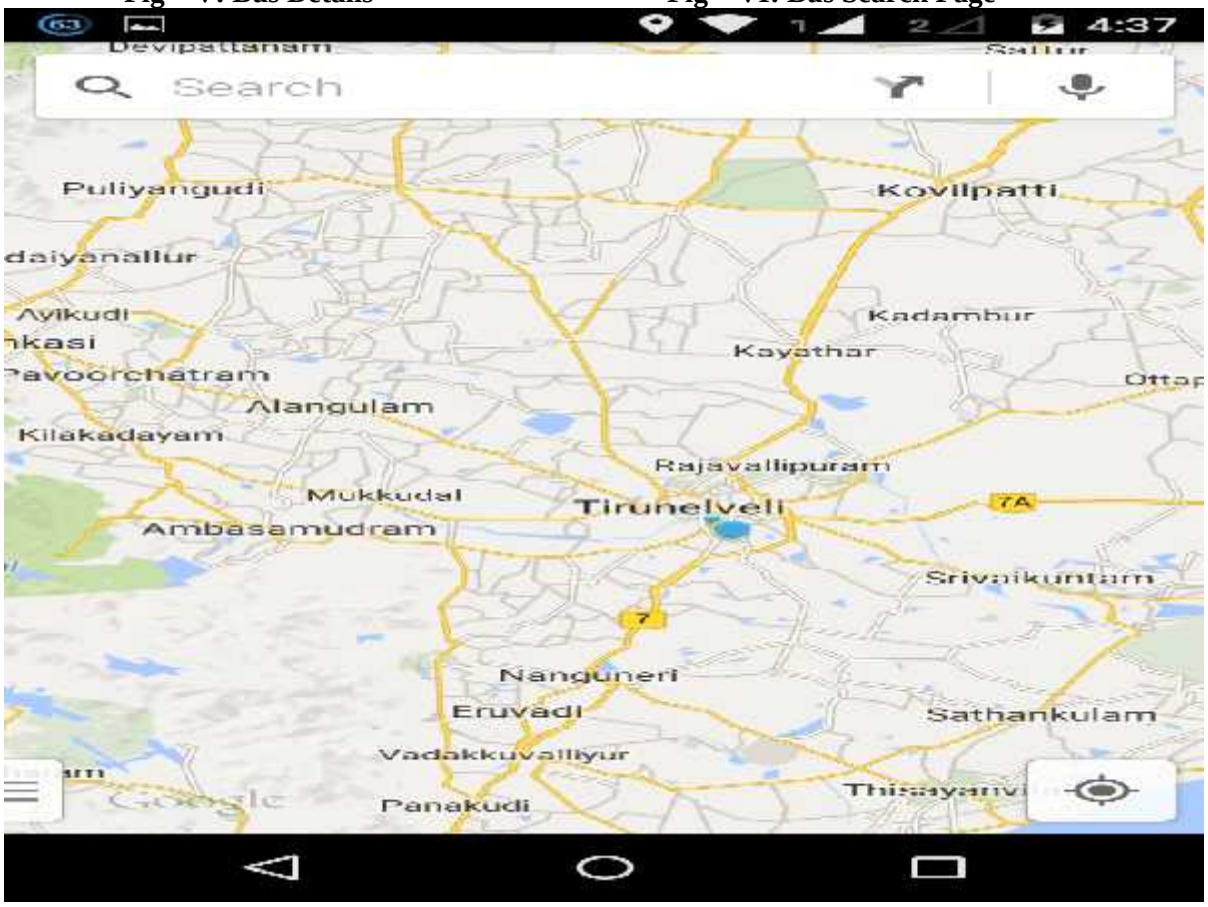

Fig – VII: Google Map Suport for Bus Route

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10. CONCLUSION AND FUTURE DIRECTIONS

The Android Application provides information about Bus, that the originating and the destination locations, the direction where bus travel which is obtained by fetching the co-ordinates through android GPS. Also by search user can easily find the buses route and timings.

Regarding future directions, the app created is just a starting point to the technology of making the private organizations to use. The students working under projects can develop this app more and more convenient to the latest structure according to user's taste in future.

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