An Efficient and Time Saving Web Service Based Android Application

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Abstract—Present world is an era of technology where communication can possible within a short time. For searching information from the web we need a computer, mobile device, internet connectivity, etc. But accessing information now-a-days is little it time consuming and sometimes not cost worthy for all users. So, for solving this problem we proposed an application. This application is called as "An efficient and time saving we service based android application". At the time of development of an application for android operated devices, there are some requirements such as to provide instant access to vehicle registration details and driving license details. Through the android application, users will give driving license number or registration number as input for searching license details or registration details respectively. Then this application will search the required information from the live server through a web service which will be present on the web server. There are mainly two parts of this application, the first part is the development of the android application and the second part is the development of the web service. This application has been developed using Eclipse IDE and Android SDK. The web service is developed using Net Beans IDE.

Keywords—Android Operation System, Android Application, Google Cloud Messaging, Web Service, Server.

I. INTRODUCTION

In today's world, smart phones are getting richer in capabilities and sensors every month. We save much personal information on our mobile. We use it for work and for connecting with our family, friends and carry them with us everywhere we go.

One of the most popular operating systems for mobile phones today is Google's Android. It has become the world's leading smart phone platform since the end of 2010. In the middle of 2012, there were 400 million devices activated and 1 million activations per day. In June 2012, there were more than 600,000 applications available for Android and over 20 billion applications downloaded from 'Google Play' (Google's online store). Android is an open source Operating System (OS) for devices such as, smart phones and tablet computers. Android architecture consists of four layers: Linux kernel, libraries, Android runtime, Application framework and applications [1-4]. Because of the open source, some of the development tools are free and there are huge numbers of applications generated. It provides a very convenient hardware platform for developers so that they can spend less effort to realize their ideas [5-8].
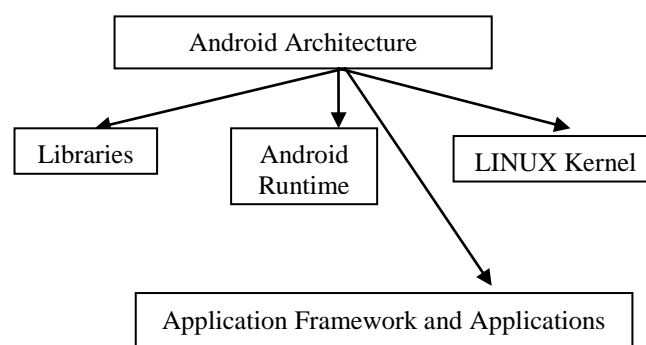
Fig. 1. Android Architecture layers

Android was developed by Google and other companies [9]. Android offers a unified approach to application development for mobile devices which means developers need only develop for Android and their applications should be able to run on different devices powered by Android. The first beta version of the Android Software Development Kit (SDK) was released by Googlein2007 where the first commercial version Android 1.0 was released in September 2008. On 27 June 2012, at the Google Conference [10], Google announced the next Android version, 4.1 Jelly Bean. Jelly Bean is an incremental update with the primary aim of improving the user interface both in terms of functionality and performance. There are many features of android which are mentioned below:

1) Attractive User Interface: Android Operating System basic screen provides an easy and attractive user interface.

2) Storage: SQLite provides a light weight relational database used for data storage purpose.

3) Connectivity: GSM/EDGE, IDEN, CDMA, EV-DO, UMTS, Bluetooth, WiFi, LTE, etc.

4) Media support: H.263, H.264, MPEG-4 SP, AMR, AMR-WB, AAC, HE-AAC, AAC 5.1, MP3, etc.

5) Web browser: Based on the open-source Web Kit layout engine, coupled with Chrome's V8 Java Script engine supporting HTML5 and CSS3.

6) Multi-tasking: User can jump from one task to another and same time various applications can run simultaneously.

7) GCM: Google Cloud Messaging (GCM) is a service that develops short message data to their users on Android devices without needing a proprietary synchronizing solution. Call back interfaces and Remote Procedure Call services are provided in the background by which applications are used to trigger different actions or accessing the data [11].

8) Android Beam: A popular Near Field Communication based technology that lets users instantly share just by touching two NFC-enabled phones together, etc. Currently the only system available for accessing the driving license and registration details from the server is via the website. We can access the website from any computer or mobile device having internet connectivity, but it is not possible to get a computer everywhere and in case of mobile it is quite difficult to access the website in poor bandwidth.

The paper is described as follows: Section II presents the related works. In Section III, the proposed scheme is given. Section IV highlights the performance analysis. Advantages of the proposed scheme are given in Section V. Section VI presents the comparison of efficiency between proposed and existing scheme. Finally, Section VII concludes the whole paper.

II. RELATED WORKS

The present 21st century is a digital era. Now-a-days the development in various aspects of mobile technology has reached beyond imagination and expectations. Every day, new mobile devices, OS, softwares are launched in the market. They have an attractive user interface and easy maintenance facility which helps users in their working field. There are some running websites of different state, providing the details regarding driving license and registration details. To open those licenses and registration in a PC is quite easy we just need internet connectivity, but usually we don't have a computer and good internet connectivity everywhere. To open those in different smart phones is time consuming as the size of the webpage is big to open in small devices and sometime low bandwidth didn't allow to connect with the site so this Application is the solution of all those.

Many tools and techniques have been designed for access online data from the server. In America different applications have been developed such as Automatic vehicle identification (AVI), Car plate recognition (CPR), License-plate recognition (LPR), and Automatic license-plate recognition (ALPR). ANPR Systems are the most widely used systems all across the world. The existing ANPR system consists of two major blocks: Lane level and Remote Computer.

At the lane level, the CCTV (Closed Circuit Television) cameras take a snapshot/video feed [12], [13] of the car in such a way that the number plate is also included in the image. A minimum of two cameras, each fitted with infrared illuminators so they can work day or night, are mounted on gantries above the road, either at the roadside or in the central reservation. The optical recognition technique is performed at the remote computer level [14].

III. PROPOSED SCHEME

In this proposed scheme, users will first select either driving license or registration category. If the driving license category selected, the driving license details and registration details will be accessed by any mobile device having Android OS and internet connectivity.

Figure 2 shows how a user can access his/her driving license details or his/her vehicle registration details from an Android operated device having internet connectivity from a server by providing the driving license number or registration number respectively.

This proposed scheme is composed of four parts, namely Database (DB) at server, Web Service (WS) at the server, Android application (App) and user. The entire sequence of searching driving license details and registration details by a user from the database present at server via an Android application and WS is shown in Figure 3.

In the proposed scheme, the user opens the Android application in his/her Android operated device and selects search criteria i.e. either driving license search or registration search. In case of driving license search, we need to provide driving license number and in case of registration search, we need to provide the registration number and then initiate the search process which is described in the below phases.

In the first phase, the driving license or registration number is sent to the web service.

In the second phase, the web service searches the database on the server.

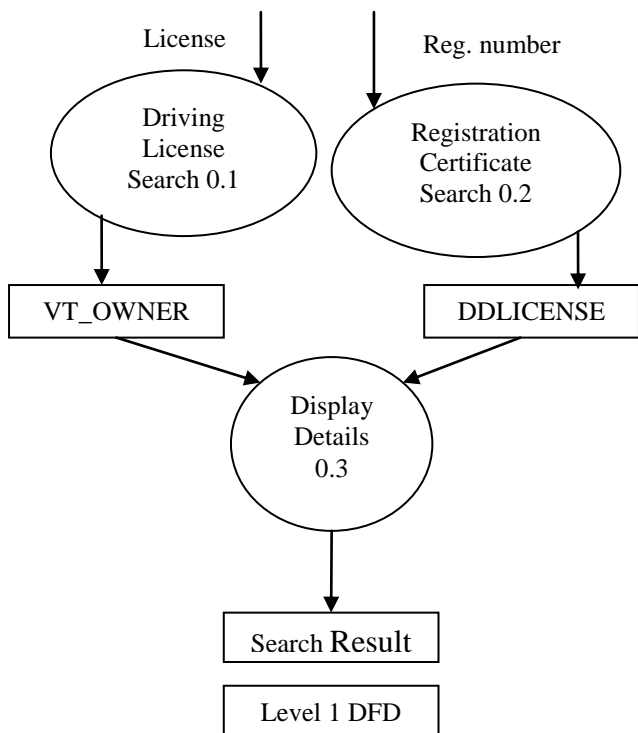In the third phase the web server forwards the search result back to the android device.
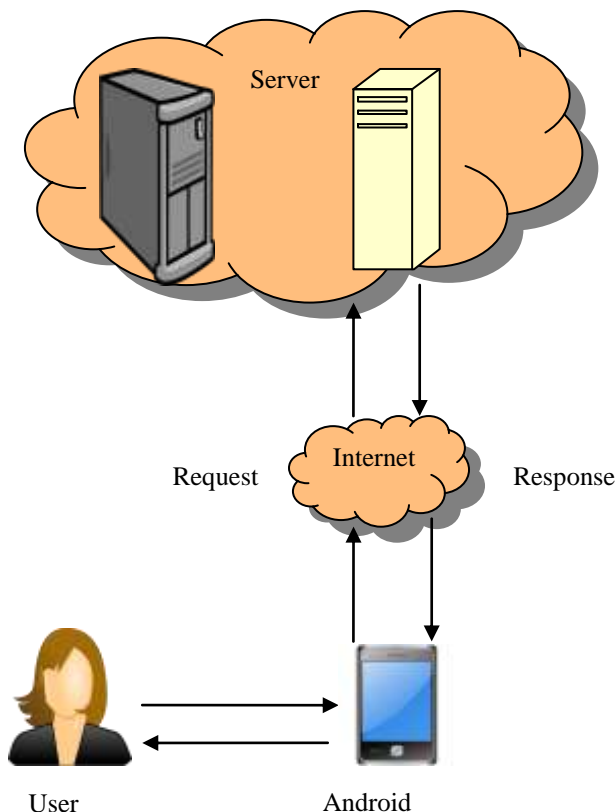
Fig. 2. User Data Access Diagram

Fig. 3. User Searching Method

A. *Proposed Algorithm*

In the proposed algorithm, we have given license number and date of birth as input and we will get

license holder details as output. There are few steps in this algorithm for better performance, which is shown below:

Step1: Select license details or registration details.
Step2: If license details are selected, go to step3 else go to step7.
Step3: Input license number.
Step4: Set L to license number.
Step5: Check L in DDLICENSE.
Step6: Retrieve the license holder details from the database if L is found else go to step 3.
Step7: Input registration number.
Step8: Set R to the registration number.
Step9: Check R in the VT_OWNER.
Step10: Retrieve the registration details from the database if R is found else go to step 7.

IV. PERFORMANCE ANALYSIS

In this section, the performance of this proposed scheme in analyzed in terms of internet bandwidth, complexity of using the scheme, extensibility, availability.

1) Requirement of Internet Bandwidth: This scheme requires less bandwidth for searching as it does not need to load the database or website. Internet is required to send the registration number or license number to the web service and get the search result from the web service.

2) Complexity of using the scheme: Having a simple technique of searching, the complexity of the proposed scheme will be very less. All users just need to provide driving license number for searching driving license details or registration number for finding registration details.

3) Extensibility: As web service is used, the same can be used for apps for mobiles having other OS like Windows, etc. We don't need to prepare separate back end for different platforms.

4) Availability: For the proposed scheme we need an android operated mobile device which are low in cost and highly available.

V. ADVANTAGES

The major advantage is that it will be very helpful for the traffic police while checking someones vehicle registration or driving license details. Fraud documents can be easily caught and time will also minimize for checking user's details. Another advantage is that if any vehicle owner or any drivers forget to carry their license, then they can use the application on their mobile to show their personal details to traffic police.

VI. COMPARISON

In this section, the proposed scheme is compared with the current scheme. The current scheme comprises of a website through which we can access information regarding driving license and vehicle

registration, but for that other than internet connectivity we need a computer. In this scheme, we need to first get hold of a computer with internet facility and then we need to access the website and provide details regarding deriving license or registration search. Now in this scheme, there are few problems, one is that it is difficult to have a computer anywhere at any moment and secondly, it is quite difficult to carry a computer or laptop, thirdly we need to have good internet connectivity for accessing the website smoothly which is not always possible. These problems can be overcome by the proposed scheme, in this scheme android operated devices are used which can be easily availed and carried. Another aspect is that the both android device and computer need internet connectivity and website can be also opened in android devices, but this app will have an advantage over the website that is, it need very less bandwidth of internet connectivity and unlike the website the app will remain present in the device so as a result internet connectivity will be required to send the search items to the web service and get the result from there.

VII. CONCLUSIONS

In this paper, a new Android application is proposed for the driving license and registration certificate search where users will need to provide driving license number or registration number for searching driving license details or vehicle registration details respectively. Here, when the user will search for any information the request is transferred to a web service which is present in the server, after that, the web service will perform search operation in the database and forward the result to the Android App. In this way, we shall be able to overcome the problems like requirement of the computer, carrying of computer and internet connectivity with good bandwidth which are faced by the current scheme.

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