

Android Sub-Urban Railway Ticketing Using GPS as Ticket Checker

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Abstract - Since the earth came into existence, every life on the earth is facing some challenges. Every human needs to stand in the queue for purchasing articles, feeling water near the tank and also to buy tickets. Tickets can vary that is, movie tickets, bus tickets, railway tickets, etc. The technology is growing so rapidly, so this must be changed. The new technology must be enhanced and must be adopted. Android Suburban Railway (ASR) ticketing is to buy the suburban tickets which are the most difficult when compared to booking the long journey tickets through 'M-ticket'. ASR ticket can be bought with smart phone application, where user can carry his railway tickets in his smart phone as QR-code. It uses Global Positioning System to detect passenger travelling from any source to any destination. It can help to identify thefts, robbers travelling through trains. As soon as passenger gets down from the train his or her ticket will be automatically deleted from his Smartphone. So he or she cannot use this ticket again for travelling. The Android Suburban Railway (ASER) which will automatically detect the passenger's fare according to the distance travelled as well as detects the passenger's identification. The User ticket information is stored in a CLOUD database for security. Also the ticket checker is provided with a checker application to look for user's ticket with the ticket number in the cloud database for checking purposes.

Keywords - Android Suburban Railway (ASR), Global positioning System (GPS), (Quick-Response) QR-code, Cloud.

I. INTRODUCTION

Public transport offers a service and generally users need to present a ticket to prove that they are entitled to travel. Few years before, E-ticketing came into existence and passengers use to register through it or buy tickets. After some months before a new technology called M-ticketing (Mobile Ticketing) was introduced where customers messaged to the web portal through mobile phones after which a complete web page download to the mobile phone where users can do the same booking process as it was in the e-ticketing facility. Android Suburban Railway (ASR) ticketing is used to buy suburban tickets which are a smart phone application, in which you can carry your ASR ticket in your smart phone as QR-code (Quick-Response). ASR uses the Smartphone's GPS. The ticket gets automatically deleted after specific interval of time once the user reaches the destination. It calculates the timing of journey and then the ticket gets invalid after exceeding that time interval. Ticket information is stored in a cloud database for security purpose which is missing in the present suburban system. On the other side, the ticket checker has a checker application to search and validate the user's ticket information which is been stored in the cloud. The ticket checker scans the given ticket and compares it with the database provided.

Time is the major concern and threat in the today's world. In order to make minimum use of the time in the field of travelling this android suburban software was introduced. By which travelling becomes very simple. Booking of the tickets now doesn't need standing in along queue. By this tickets can be booked through phone only. It provides all the information of the trains to be enquired. User needs to enter their login id and confirm the ticket. Ticket is then stored in the phone itself. Carrying the tickets or missing the ticket problem is been solved here. This makes booking and handling easier. The main aim of this software is providing the user ease. Once the PHP code generates the ticket number and time of buy details saved in the MySQL database are sent to Google Chart API engine in order to generate the QR code. All the individual information and the ticket details is then stored in the QR code and then used to validate by the ticket checker.

II. ASR APPLICATION SOFTWARE PLATFORM ON ANDROID

Android is an operating system and a software platform upon which applications are developed. Android is the first in a new generation technology of mobile development platforms, giving its platform developed opens a distinct edge to the competitors. Android is an open source platform. For both developers and handset manufacturers, there is no need to pay royalties or license fees to develop for the platform. Android applications are written in a well-respected programming language: Java. On the Android platform, there is no distinction between native and third-party applications, providing the best services comparing other application developers. Each and every Android applications use the existing libraries. User Application is shown in figure 1.

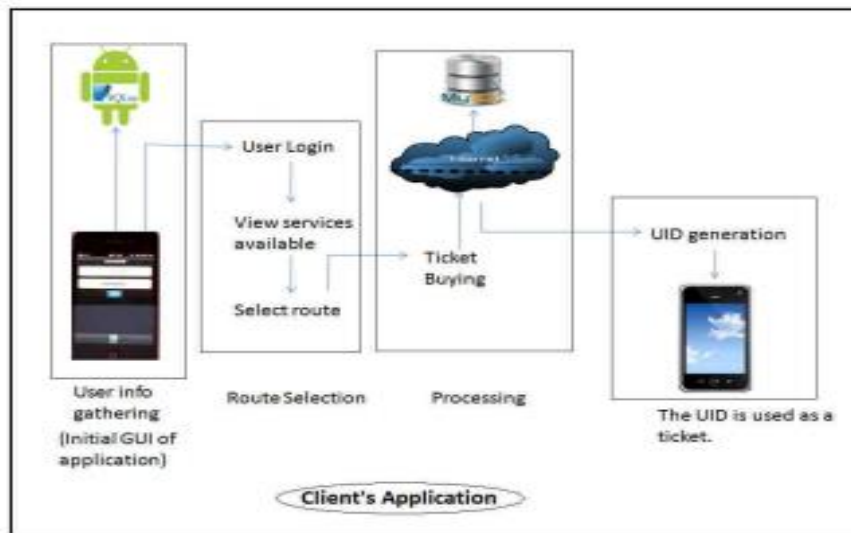


Figure 1: User Application

III. FACILITY TO VALIDATE USING QR-CODE

A QR code is any code that you find on most of any items you buy from the store. QR codes have come a long way and now that they are integrated into the online world it's a true phenomenon. It makes searching for online products, shopping and buying much easier. Now, we are going to use it for buying tickets. Creates an image in real world and acts like a web link for the smart phones. It actually grabs the code scans the item and goes online searches for the item which then give you so many details about the product. The user gets specific details as per user choice and reviews about the product you have just scanned from the scanner. When you scan a QR code a magazine, a newspaper or wherever the I-Phone or Android will to you go to a website where you will find much of promos, coupons, maps and many more information. QR codes now are used in a much broader context, including both business tracking applications and convenience-oriented applications aimed at mobile phone users, to open a Uniform Resource Identifier (URI), or to compose an e-mail or text message. Users can generate and print their own QR codes for others to scan and use by visiting one of several paid and free QR code generating websites or applications. It has then become one of the most-used types of two-dimensional barcode.

Encrypted and Encoded Or Codes

Encrypted QR codes, which are not very common, have a few implementations. An Android application, for example, manages encryption and decryption of QR codes using the DES Algorithm (56 bits). The format information records two things: the error correction level and the mask pattern used for the symbol. The mask patterns are displayed as a grid that is repeated as necessary to cover the whole symbols. Modules corresponding to the dark portion of the mask are inverted. The format information is protected from errors with a BCH code with each QR.

This task is handled by the ticket checker. The ticket checker is given the QR validation software by which he can check and scan the QR code. The ticket checker clicks the image of the code and then scans. The information that is stored in the database is then compared with the QR code and the ticket is validated. Once the ticket is validate and reached the destination the ticket info is been deleted from the database.

IV. GLOBAL POSITIONING SYSTEM IN ASR

GPS is an important part of the software. With the help of the GPS the current location of the user is been found out. The ticket assessment is done with the help of the GPS. The info that is stored in the database is compared with the user's geo points and the validation is carried out. If the geo point of the user exceeds the destination address then the ticket is turned invalid. The time is been calculated with the help of GPS.

V. TICKET BOOKING

In this process after getting the login id the user can access the application to book his tickets. For this the user has to choose the source and destination address of his journey. The type of ticket depending upon personal expenses is done. The user can also select the ac and other reservation techniques. Available tickets are shown and the booking is done accordingly. And all the information is stored in the SQL server database.

VI. ANDROID CLOUD TO DEVICE MESSAGING (C2DM)

Android Cloud to Device Messaging (C2DM) is a service that helps developers send data from servers to their applications on Android devices. It allows third-party application servers to send lightweight messages to their Android applications. The message service is not designed for sending a lot of user content via the messages. Rather, it should be used to suggest the application that there is new data on the server, so that the application can read it.

An application on an Android device doesn't need to be running to receive message. The system will woke up the application via Intent broadcast when the message comes, as long as the application is set up with the proper broadcast receiver and permissions.

It requires devices running Android version 2.2 or higher that also have the Market applications installed. However, you are not limited to deploy your applications through Market. It uses an existing connection for Google services. This requires users to set up their Google account on their mobile devices. This means that C2DM has stopped accepting new users and quota requests. No new features will be added to C2DM. However, apps using C2DM will continue to be working. Existing C2DM developers are encouraged to migrate to the new version of C2DM, called Google Cloud Messaging for Android (GCM).

VII. SQLITE AS A DATABASE FOR ASR

SQLite is a relational database management system contained in a C programming library. In contrast to other database systems, SQLite is not a unique process that is accessed from the user application, but an integral part of it. SQLite is a popular choice as embedded database for local/client storage in application software such as web browsers. It is arguably the most widely deployed database engine, as it is used today by now all standard browsers, operating systems, and embedded systems. SQLite uses an unusual type system for an SQL-compatible DBMS; instead of assigning a type to a column as in most SQL database systems, data types are assigned to unique values; in language terms it is not statically typed. Moreover, it is not strongly typed in some of the same ways that Perl is: one can insert a string into an integer column. However, the technique is static to other SQL products. Several computer processes or threads may access the same database concurrently. Several read and write accesses can be satisfied parallel. A write access can only be satisfied if no other accesses are currently being serviced.

VIII. TICKET CHECKER APPLICATION

The application frees the ticket checker from all the paper work and makes his job much simpler. He just needs to enter the UID of the passenger's ticket and the application will convey him about the validity of the ticket. When the ticket checker enters the UID of the ticket, a request is sent to the server. The server then checks this UID with the database and verifies that such an UID is issued and also confirms that the time of the ticket has not been elapsed and is a valid ticket. The validity of the ticket is for a threshold value which depends upon the time required for the respective journey. Once the threshold value will be reached it will be instinctively invalidated by the system. Checker application shown in figure 2.



Fig 2: Checker Application

IX. OVER VIEW OF ASR AND SYSTEM DESIGN

This application will be used to book tickets for local journeys through Android phones. This will passenger to download the application file from GOOGLE PLAYSTORE and use the application. It will to check if a path is available between two suburban stations, calculate fare and allow the user to buy tickets. The ticket will be in the form of a digitized ticket (i.e) a unique identification number that will be provided to the passenger. Also the method of ticket checking will be enhanced. The ticket checker will use a similar application to check a legitimate passenger.

X. CONCLUSION

Mobile ticket application developed for Android 1.5 using Java, SQLite, MySQL, and PHP on the server side which can change the way people buy their tickets in future. This kind of ticketing application can be applied to any kind of transport system. This android application can be very useful for governmental organization for tracking the user. It means the user can be detected very easily for validating purposes. Through GPS facility of android mobile, the passenger can get the list of metro station or railway station easily and he can quickly buy the tickets. This application saves a huge work for our ticket checkers by GPS validation of tickets and also moving from manual ticket checking process to digital ticket checking process by just scanning with his own android mobile to validate the ticket. Station level security we can have Hardware devices to validate the QR codes before the user enters or leaves the station, where the user can have access towards platform after being validated by the hardware device. Our android application is one of its kinds and finds huge application to buy suburban railway tickets through android mobile.

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