Android Application Generating Qr Code as Railway Ticket

Karthikram

Final Year I.T SMVEC

Saravanan

Final Year I.T SMVEC

Madhavan

Prathesh

SMVEC

Final Year I.T

Assistant Professor SMVEC

Abstract

This system aims at booking Sub-Urban Railway Tickets in asimple way. The major complication in current Ticketing facility is wasting time in "LongQueue" to buy our Sub-Urban Railway Tickets. The "M-Ticket" facility is not available and fails with the local travel tickets. Our Proposed System is used to generate the Railway ticket as QR Code which can be carried in smart phones. The "GPS" facility in Smart Phones is used to validate and delete the ticket automatically once the passenger reaches the destination. The passenger's Information is also stored in CLOUD database for security purpose which lacks in present suburban system. The passenger's ticket information is retrieved from the CLOUD Database using the ticket number.

Key words:

Android; SQL Lite; Cloud Database; QR Code.

1. Introduction

Due to the tremendous advancement in the field of technology in areas such as railway department the booking of ticket through governmental websites known as E-ticket was introduced. This E-ticket facility helps the passengers to book their long journey tickets. Once the ticket is booked a confirmation mail is send to the passenger with the ticket info that should be carried out as a print out. Following E-ticket facility a new technology called M-Ticketing was introduced that helps the passengers to book and to receive their journey tickets in their mobiles which is similar to the E-ticket facility. The problem faced in both these technology is we suffer if we forget our confirmation prints and we stand in the Queue for our local suburban tickets, which is a place where e-ticketing; m-ticketing was unable to lay their foot prints. This system aims at booking Sub-Urban Railway Tickets in a simple way. The major complication in current Ticketing facility is wasting time in "Long Queue" to buy our Sub-Urban Railway Tickets. The "M-Ticket" facility is not available and fails with the local travel tickets. Our Proposed

System is used to generate the Railway ticket as QR Code which can be carried in smart phones. The "GPS" facility in Smart Phones is used to validate and delete the ticket automatically once the passenger reaches the destination. The passenger's Information is also stored in CLOUD database for security purpose which lacks in present suburban system. The passenger's ticket information is retrieved from the CLOUD Database using the ticket number.

3. Android Platform

Android is a Linux based mobile platform Operating System and it is developed by Open Handset Alliance led by Google. It is the largest growing platform. Android comes in various versions and some modified forms of android versions are used for other purposes.Everyday millions of Android devices are activated. It is the fastest and largest platform and operating system. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming. Android has a large community of developers writing applications ("apps") that extend the functionality of the devices. Developers write primarily in a customized version of Java. Apps can be downloaded from third-party sites or through online stores such as Android Market, the app store run by Google. As of October 2011 there were more than 400,000 apps available for Android, and the estimated number of Applications downloaded from the Android Market as of December 2011 exceeded 10 billion.

4.Features

- Application framework enabling reuse and replacement of components.
- Dalvik virtual machine optimized for mobile devices
- Integrated browser based on the open source Web Kit engine.

- Optimized graphics powered by a custom 2D graphics library; 3D graphics based on the pen GL ES 1.0 specification (hardware acceleration optional).
- SQLite for structured data storage
- Media support for common audio, video, and still image formats (MPEG 4, H.264, MP3,AAC,AMR, JPG, PNG, GIF)
- GSM Telephony (hardware dependent)
- B1uetooth, EDGE, 3G, and Wi-Fi (hardware dependent)
- Camera, GPS, compass, and accelerometer (hardware dependent)
- Rich development environment including a device emulator, tools for debugging, memory and performance profiling, and a plug-in for the Eclipse IDE

4.1 SQL Lite

SQLite is a Relational Database Management contained in a small C programming library. SQLite implements most of the SQL standard and is also ACID compliant, using a dynamically and weakly typed SQL syntax that does not guarantee the domain integrity. In contrast to other database management systems. SOLite is not a separate process that is accessed from the client application, but an integral part of it. SQLite implements most of SQL-92 standard for SQL but it lacks some features. A standalone program called SQLite3 is provided that can be used to create a database, define tables within it, insert and change rows, run queries and manage SQLite database file. It is a single executable file on the host machine. It also serves as an example for writing applications that use the SQLite library.

4.2 Android Cloud to Device Messaging Framework

Android Cloud to Device Messaging (C2DM) allows third party application servers to send lightweight messages to their Android applications. It is not designed for sending lit of user content via messages but it is used to tell the application that there is new data on the server, so that the application can fetch it. The C2DM service handles all aspects of queuing of messages and delivery to the target application running on the target device. It uses an existing connection for Google services.

5. QR Code

A QR code (abbreviated from Quick Response code) is a type of matrix-barcode (or twodimensional code) first designed for the automotive industry. The QR Code has soon become popular outside of the industrydue to its fast readability and comparatively large storage capacity. The code consists of black modules arranged in a square pattern on a white background. The information encoded can be made up of four standardized kinds ("modes") of data (numeric, alphanumeric, byte/binary, Kanji), or by supported extensions virtually any kind of data. It has become popular outside the automotive industry due to its fast readability and greater storage capacity compared to UPC barcodes. It consists of black modules (square dots) arranged as a square grid on white background. It can be read by imaging device and processed by Reed-Solomon error correction, data is then fetched from patterns in both horizontal and vertical components of image.

5.1 QR Code in Mobile Operating System

QR Code can be used in Android, Blackberry OS, Nokia Symbian as well as Apple iOS devices. The browser supports URL redirection which allows QR Code to send metadata to existing applications on the device.

5.2 Encoding

Two things are recorded as information format they are the error correction level and the mask pattern used for symbol. Masking is to break up patterns in the data area that might confuse a scanner. The masked patterns are defined on a grid that is repeated as necessary to cover the whole symbol. The format information is protected from BCH code, and two complete copies are included in each QR symbol.

5.3 Storage

The amount of data that can be stored in the QR code symbol depends on the data type (mode, or input character set), version (1,.., 40,i indicating the overall dimensions of the symbol), and error correction level. The maximum storage capacities occur for 40-L symbols (versions 40, error correction level 1)

Input Mode	Max.	Bits	Possible
	Char		characters
Numeric only	7,089	31/3	0,1,2,3,4,5,6,7,8,
			9
Alphanumeric	4,296	51⁄2	0-9,A-Z, \$,%,-,+
Binary/Byte	2,953	8	ISO 8859-1
Kanji/kana	1,817	13	Shift JIS X 0208

Table 1: QR Storage Capacities

5.4 Error Correction

Code words are 8-bits long and use the Reed-Solomon Error Correction algorithm with four error correction levels. The higher error correction level, the less storage capacity. The following table lists the approximate error correction capability at each of the four levels:

- Level L 7% of code words can be restored.
- Level M 15% of code words can be restored.
- Level Q 25% of code words can be restored.
- Level H 30% of code words can be restored.

Due to the design of Reed-Solomon codes and the use of 8-bit code words, an individual code block cannot be more than 255 code words in length. Since the larger QR symbols contain muchmore data than that, it is necessary to break the message up into multiple blocks. The largest possible block size is never used, though. The QR specification defines the block sizes so that no more than 15 errors can be corrected within each block. This limits the complexity of certain steps in the decoding algorithm. The code blocks are then interleaved together; making it lesslikely that localized damage to a QR symbol will overwhelm the capacity of any single block. Thanks to error correction, it is possible to create artistic OR codes that still scan correctly, but contain intentional errors to make them more readable or attractive to the human eve, as well as to incorporate colors, logos and other features into the QR code block.

6.System Design

6.1 User Information Gathering

The application gathers the user's basic information during the first time installation. It gathers the basic customer information like name, date of birth, city, state etc., and it will be stored into user mobile, SQLite database. So every time when the user buys the ticket this information is also sent to the database for security purpose and used also in the OR generation.

6.2 Selecting Ticket Type

The user selects source, destination, class, no. of Adult and child tickets, ticket type like return or single etc. then the user browse through the menu option to choose either credit buy option or token buy which simplifies the buy process by remembering the credit card details. Once the user chooses any of these options the application moves on to the pin code validation module.

6.3 Credit Card Validation

Once the customer hits the buy button a VB code in the railway server validates the pin number and passwords of credit card, if it is successful it saves both the journey details and customer info in the server's MySQL database. After which ticket number and time of buying is generated by the VB code and the balance credit value is displayed.

6.4 QR Code Generation

Once the ticket number and time of buy is generated the details saved in the MySQL database are sent to Google Chart API engine in order to generate the QR code. here all the personal and ticket information are converted into QR code and sent back to the user mobile as HTTP response and saved in the application memory.

6.5 GPS Ticket Validation

In this Module the GPS (fig1.1) plays the role of the checker, where when the user buys the ticket, the source geo points, destination geo points, ticket type, expiry time & date are stored in a mobile SQLite database. This service checks the user's current location in accordance with the destination geo points, after which the ticket type is checked and accordingly the ticket is deleted if two is single or updated if type is return.

6.6 Checking QR Code with QR Reader

In this module the checker will have QR Code reader and scan the QR code with the application in order to validate QR code and verify the journey details, especially the time and date of the ticket.

7. Hardware Requirements

7.1 GSM Module

GSM-Global System for Mobile communication

- Globally accepted standard for digital cellular communication.
- GSM can be effectively used for the automation of various homes, offices and industries

7.2 GSM-Advantages

- International roaming.
- Low-cost mobile sets and base stations (BSs)
- High-quality speech
- Compatibility with Integrated Services Digital Network (ISDN) and other telephone company services.
- Support for new services.
- Improved battery life
- Advanced features such as short messaging and caller ID

7.3 GSM Network Architecture



Fig 1.0 GSM Network Architecture

- The GSM network can be divided into three broad parts.
 - Mobile station
 - Base station system

• Network sub system

7.3.1Smart card (SIM Card)

- SIM stands for Subscriber Identity Module.
- The SIM provides personal mobility, so that the user can have access to all subscribed services irrespective of both the location of the terminal and the use of a specific terminal.
- The SIM card contains the International Mobile Subscriber Identity (IMSI), identifying the subscriber, a secret key for authentication, and other user information.

7.3.2 Base station Substation:

Base Transceiver Station (BTS):

The BTS houses the radio transceivers that define a cell and handles the radio link protocols with the Mobile Station.

Base Station Controller (BSC):

The BSC is the connection between the mobile and the Mobile service Switching Center (MSC). The BSC manages the radio resources for one or more BTSs.

7.3.3 Network Sub System (NSS):

It provides the main control and interfacing for the whole mobile network. Mobile service Switching Center (MSC): It is the central component of the Network Subsystem Performs the telephony switching functions of the system (controls calls to and from other telephone and data systems

7.4 GSM Modem Interfacing with PC



Fig 1.1 Block diagram of GSM interfacing with PC

8.2 Architecture for GPS Validation



Fig 1.2 Architecture of GPS validation



8.1 Architecture of QR Code Generation



Fig1.0Architecture of QR Code Generation

9.Conclusion

We have presented a 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. Also our app 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. Hence a huge problem of issuing local train tickets has been solved with our application. Knowing the arrival time of the trains will also ease the user to allot his time accordingly to reach the station, so we suggest usingGPS here to find the location of the user and nearby train station to display the train arrival timings. Still more advance modification can be a Dynamic display of Train locations by fitting GPS devices in trains to show its location in the Google map display which is available in our application. Also as a 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.

10.Reference

- Damon Oehlman and Sebastien Blanc (2011) " Pro Android Web Apps develop for Android Using HTML5,CSS3&JavaScript " –Apress Publications.
- [2] Dave Smith and Jeff Friesen's (2011) "Android Recipes' A Problem Solutin Approach "–Apress Publications.
- [3] Jeff "JavaJeff" Friesen's (2010) " Learn Java For Android Development"-Apress Publications.
- [4] Lauren Darcey and Shane Conder (2010) "Sams Teach Yourself Android Application Development" –Sams Publications.
- [5] Mark Murphy's (2011) " Beigining Android 3" Apress Publications.
- [6] Reto Meier (2009) " ProfessionalAndroid Application Development "–Wiley Publications.
- [7] SatyaKomatineni (2009) "Pro Android "-Apress Publications.
- [8] Shawn Van Every's (2009) "Pro Android Media developing Graphics Music, Video and Rich Media Apps for Smartphones and Tablets " –Apress Publications.
- [9] Wallace Jackson's (2011) "Android Apps for Absolute Beginners "–Apress publications.
- [10] Wei Meng Lee (2011) "Beginning Android Application Development" – Wiley Publishing Inc.