

Credit Card Processing System Using Web Service Architecture

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Abstract

The number of credit card companies is increasing day by day because of direct and indirect extra income from the credit card holders. This leads to humongous number of credit card holders. Now it becomes much harder to manage than before as each individual is holding number of credit cards. At the same time, the usage of smart phones (specially android operating system) is rising to the top where everyone carries at least one mobile, especially, every credit card holder. So we propose a prototype of credit card approval processing system using mobile phone (android OS) which will significantly reduce the time of the customer and the banking system.

Keywords: Android, client-server, WSA (web services architecture), PHP, credit card payment, m-banking.

1. Introduction

The traditional way for requesting a credit card is that the customers have to go to their bank down the knees and apply for the issue of credit card which becomes a very vast procedure and this requires some days to get done with the whole process. Meanwhile, it is not guaranteed that the customer will be provided with the credit card in the specified time resulting in the waste of customer's time and the same time bank will require the manpower to save these information into the database manually which is a time consuming as well as wastage

of money, thus the traditional way of requesting the credit card is insufficient.

At the same time people have moved on to smart phones (Android OS) because of its handy feature. So to overcome the limitations of traditional way of requesting the credit card and adopt the popularity of the android phone we introduce a unique idea by providing the customer to make request of credit card from its android mobile phone. This application will provide quick response to the customer as compared to the traditional way. This will significantly save tremendous amount of time for the customers as well as banking officials. This application communicates with the web services and the results delivers directly to the customer mobile phone i.e. credit card PAN no. Using this customer can make any transaction. Also, we use the SMS and notification method for accuracy.

The most important part of this application is web service (SOAP/WSDL) [1] is that they are standardized and easy to integrate from a programmers view point enabling to establish a good business to customer (B2C) or business to business (B2B) model that the whole platform adheres to. The rest of this paper describes the software technologies involved, the reason of their selection and of course HTTP based server and android based mobile client [2].

2. Platform and technology

2.1. Android Operating System

The application software will be developed in android operating system. Android operating system offers modern and advance functionalities such as Graphical User Interface (GUI), programming access to the preinstalled web browsers engine. Android operating

system is open source. It provides tools and Application programming interfaces (API) for application development using Java programming language. Its virtual machine is called Dalvik optimized for mobile devices which is similar to the Connected Limited Device Configuration (CLDC)[3] for J2ME created for resource-limited devices.

The Android SDK provides you the API libraries and developer tools necessary to build, test, and debug apps for Android.[4]. Integrated Development Environment (IDE's like Eclipse) will provide us bug free environment to develop this application. Various core libraries and services in Android system [4, 5, 6] are divided into five categories; applications, application framework, libraries, Android runtime, and Linux kernel as shown in Figure 1. Core applications offer SMS, browser, email, and others to mobile developers, while libraries and services for development are included in other four categories such as the following: Figure

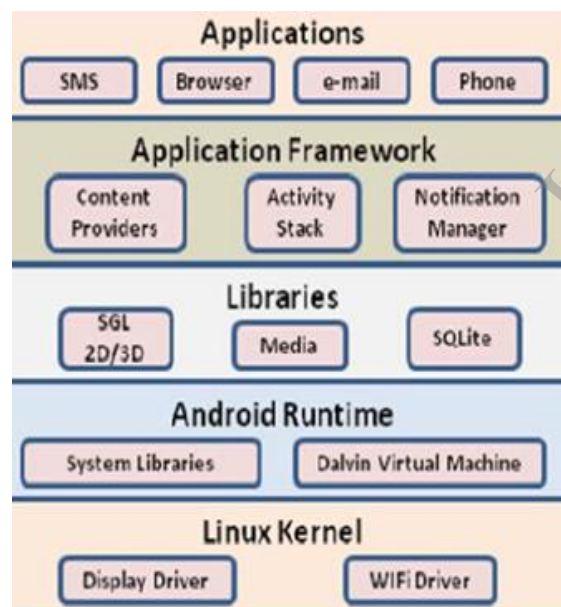


Figure 1. Components in Android Architecture [5]

2.2 PHP and MySQL

PHP [7] (recursive acronym for *PHP: Hypertext Preprocessor*) is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML. Instead of lots of commands to output HTML (as seen in C or Perl),

PHP pages contain HTML with embedded code that does "something". The PHP code is enclosed in special start and end processing instructions `<?php and ?>` that allow you to jump into and out of "PHP mode." MySQL [8] is a relational database management system that runs as a server providing multi-user access to a number of databases. It is named after developer Michael Widenius' daughter, my. The SQL phrase stands for Structured Query Language. MySQL is a key part of LAMP (Linux, Apache, MySQL, PHP / Perl / Python), the fast-growing open source enterprise software stack.

2.3 Web Services

A web service is a method of communication between two electronic devices over the World Wide Web. A web service is a software function provided at a network address over the web or the cloud; it is a service that is "always on" as in the concept of utility computing.

2.3.1 ARCHITECTURE

A typical Web services architecture consists of three entities:

- Service providers who create Web services and publish them to the outside world by registering the services with service brokers;
- Service brokers who maintain a registry of published services; and
- Service requesters who find required services by searching the service broker's registry. Requesters then bind their applications to the service provider to use particular services.

Figure shows the interaction between service providers, service brokers, and service requesters in the publication, discovery, and consumption of Web services.

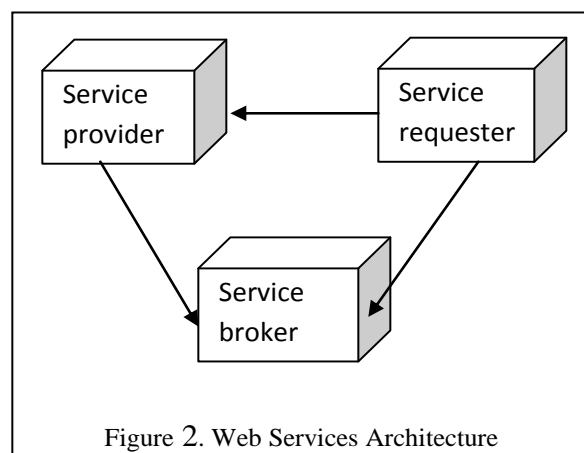


Figure 2. Web Services Architecture

2.3.2 CORE TECHNOLOGIES

Web services are essentially founded upon three major technologies: Web Services Description Language (WSDL); Universal Description, Discovery and Integration (UDDI); and the Simple Object Access Protocol (SOAP). These three Technologies form the core Web services technologies. WSDL is a language programmer can use to describe the programmatic interfaces of Web services. UDDI lets Web services register their characteristics with a registry so that other applications can look them up. SOAP provides the means for communication between Web services and client applications. [1, 9].

3. System Working

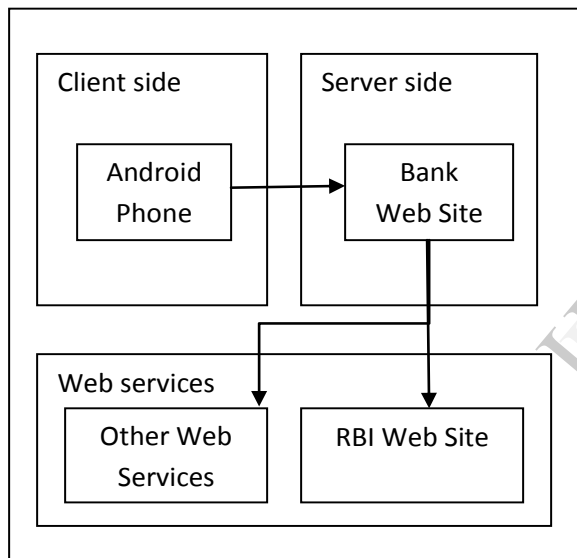


Figure 3. System overview architecture

3.1 Client side

The user first needs to login with A/C number. A/C number will be authenticated from the server and user will be logged in successfully. After the login, customer can request for the issue of credit card or can check the status of the request as well. While requesting for new credit card, customer needs to fill the new requesting form which include personal information, annual income etc. This information of the customer will be send to the server for accuracy of the bank's account details. It is mandatory for the customer to mention his mobile number and address as well for verification. Once the server side component i.e. bank verifies the mentioned information of the customer then the customer will be provided with a 16 digit PAN number on the cell phone. The whole working is done using web services

architecture (WSA). Using the available PAN number, customer can make payment or purchase the goods using web services provided by the bank using the NCCPS (Notified Credit Card Payment System) [9].

3.2 Server Side:

Information of the customer will be stored in the database. The server side has a database of customers including their personal information and transaction. Our application communicates with the server when the customer logs in to his bank account. When the customer request for the issue of credit card, initially his request will be send to his bank and checks the customer history and later on, the bank forwards the customers information to RBI (Reserve Bank Of India) using the web service. RBI will check whether the available customer has been black listed or not from its own database and sends the response back to the corresponding bank. According to the result obtained from RBI as well as history, transaction and annual income of the customer, the bank will decide which credit card should be issued to the customer which is either platinum/silver/gold. Once the type of credit card is decided, the 16 digit unique credit card number called PAN (Primary Account Number) will get transferred to the customer handset using SMS (Short Message System)/alert mechanism.

3.3.3 Web service:

As we know that web services communicate with each other. In our system, bank's web service communicates with RBI web service and other available web services.

4. Conclusion

The Android platform proved to be capable of supporting Web services, Although our android client application is dedicated exclusively to online services, it is easy to see that every kind of online services can be made available in every kind of application running on internet enabled platforms. Web services are basically the technical counterpart of the B2B/B2C model – where entities collaborate and integrate one into another for better profits and customer satisfaction. We also managed to establish a client-server communication model where client is running on the android OS and server uses different platforms like java, .NET framework and so on. Problems such as confidential information security can be overcome using the alert mechanism.

5. References

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