Chapter 4

Approach to implement Automated mobile Money System for Sri Lanka

4.1 Introduction.

In the previous chapter it has been discussed the technologies used to implement the system. In this chapter it has been described about the approaches to the design and implementation of the system.
System could be implemented mainly according to following three methods.

1. Customer and bank connecting via internet (http).
2. Connecting directly to the mobile operator SMSC via SMPP.
3. Using a modem application.

4.2. Customer and the bank connecting via internet (http).

In the first approach, finalizing the security model was the major problem faced. To improve the usability of the system it's required to minimize the security threats.

Few parties like banks, retailers and mobile providers are involved in this system. Therefore transferring data between these parties should be done in a secure manner. Mainly the data transferring is happening through SMS and it is much secured.

Main security threat occurs when transferring data between the mobile company and the merchant (bank). Because customer information has to come to the mobile provider and information should be transferred to the bank. This process is not totally secure. But it can be minimized via using the https connection or the socket connection through a VPN.

Otherwise transactions have to be done directly between bank and the customer via http/https connection. It requires J2ME enabled mobile phones and 3G or GPRS to access Internet. Most of the users in Sri Lanka do not have phones with these facility. Also it is practically difficult to get the https connection because it needs a domain to get a https connection. Therefore it is not reliable and it is not guaranteed as full secured.

4.3. Connecting directly to the mobile operator SMSC via SMPP.

Second approach is to connect to the mobile provider's SMSC directly and receive the SMS and deliver it to the bank. Then reply message originating from bank's end and send the reply as a SMS to the customer directly via SMSC. As discussed earlier, SMPP also open source API and use to send SMS. It will directly connect to the SMSC of mobile provider and send SMS. It is technically possible, however it's not given permission to connect to the mobile provider's SMSC to send SMS to a third party.

4.4. Using modem application.

Therefore it has to find a way to send SMS without direct involvement of the SMSC and it is the third approach. In this approach SMS are being sent independently, without any involvement of mobile company. Main advantage of this approach is, every mobile user is able to use this facility as far as they can send and receive SMS using their mobile device. Therefore expensive high end mobile devices are not required to do the transactions and usability would increase. Also this method is much secured than other two approaches.

But this was a major challenge of the project. It has to find a way to send SMS using an external 3G modem which author had.

As discussed in the earlier chapter it was found JSMEngine open source API after searching on the internet. It has to configure the modem to the application in order to use

this method. To do this first it has to connect the 3G modem to the computer through a USB slot of the computer. Then it's required to find the COM port which is mapped to the modem. Then it has to find a way to communicate with the COM port using java programming language. It has to arrange COM.jar file, dll and property file in proper locations to communicate with the com port. Then modem is connected to the application. But initially it was not connected with the application properly. It has displayed "Connect to the device failed -11" error message or sometimes displayed the error number 22.

Thereafter had to check the connectivity of modem using the hyper terminal software in the Windows operating system and send SMS via AT commands. Finally the "error 22" displayed and it is because modem cable loosely connection with the computer or modem is not ready state to send SMS. (There is a small bulb in the modem to indicate modem is in the ready state or not). Reason for the error number 11 was the port connected with the modem was already in use.

The next technology which has to adapt is server and client socket application. Server and client sockets are used to connect with the bank and the mobile operator. The main problem author faced was when client (Mobile Company) sends a message to the server (Bank), Client has to wait until to receives the reply message, to send the next request. If server does not send the reply it will not be able to send the second customer request to the bank. Finally it has to remove coupling with send and receive to solve this issue. A separate thread is started to send request inside the main thread which receive messages.

AJAX technology is used to implement the direct customer handling parts of the system. Earlier it was decided to do this part of the implementation only by using JSP and java bean classes. But to learn the technology and to get the advantages like speed of the system, it was decided to use this technology. Also it improved the user friendliness of the application.

The next technology used in the project is Jasper reporting tool. Previously it was a challenge to use this new technology. But when it is used to the tool it was easy to generate report other than using HTML and JSP. Because without designing the report using HTML it is possible to directly design the report using the IReport tool.

These are the approaches to implement this system. Few new technologies learned from the project and it is possible to use these technologies to future systems as well. Especially modem application can be reused for future applications. Other technologies like AJAX and jasper can be plugged easily to the future developments.

4.5 Summary

In this chapter it has been discussed various approaches to the project and reasons to select or remove them. Also it has been described problems faced when using these new approaches and technologies and finally how those problems solved.

In the next chapter it has been discussed about the analysis and designing part of the project.