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A SECURE NFC APPLICATION FOR CREDIT TRANSFER USING MOBILE PHONES

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Abstract: *People continuously try to improve their quality of life and technologies have an important role on it. Money transaction between mobile devices is bored and a difficult operation to perform since there is not a simple and safe way to do it. Near field communication (NFC) is a new secure short-range wireless connectivity technology, can play an important role on this kind of issues. In upcoming years the NFC technology can offer an important contribution to simplify some daily operations, such as payments and money transactions. This project focused on NFC technology and proposes a peer-to-peer based application that demonstrates the usage of NFC and Bluetooth technologies for money transaction between mobile devices and third party bank.*

Keywords*: Cumbersome-Difficult to use, Tedious-slow, Peer-to-Peer-point to point network.*

1. INTRODUCTION

Here the concept is that, user will be having a bank account in some bank and he/she will have a smart phone. Consider a user will go to any shop/mall etc. Will buy some items. Now for buying user need to visit that place, once he/she done with the item selection a shop/mall owner will generate a final bill with final amount. Now user don't need to interact in physically terms like card or cash and user will start mobile application and will connect to shop/mall server and pay required amount. The type of payment will solve long queue problem which user's face daily in shops and mall. The required amount will get deducted from user bank account and deposited to shop account. The NFC data exchange format (NDEF) specification defines a data format to exchange information between two NFC enabled devices. NDEF is a lightweight, binary message format that can be used to encapsulate one or more application, defining payloads of arbitrary type and size into a single message construct. In the proposed application, Bluetooth is the main responsible for the Credit

Transfer operation. In the application, the NFC only has the role of launching the communication. All the other operations are performed by Bluetooth.

2. RELATED WORK

2.1 Motivation

The motivation behind this watch to simply skip the long queues in shopping mall and save precious time. This project will reduce the strain on the mall employees.

2.2 Implementation

Users and Characteristics. The user of this product/system will be customer (any person) who wants to pay their bill through mobile.

2.3 Operating Environment

Software has main component is the mobile application. Requires android handset with NFC chip and Bluetooth. Our project requires Processor – Intel Core2Duo, Pentium –III/i3 Speed 2.4 GHz RAM - 1 GB (min) Android phone with min 512 MB RAM or more mobile application will support Android phones so at least 2 Android devices required getting the output.

Overall flow of our project is shown in Fig.1.

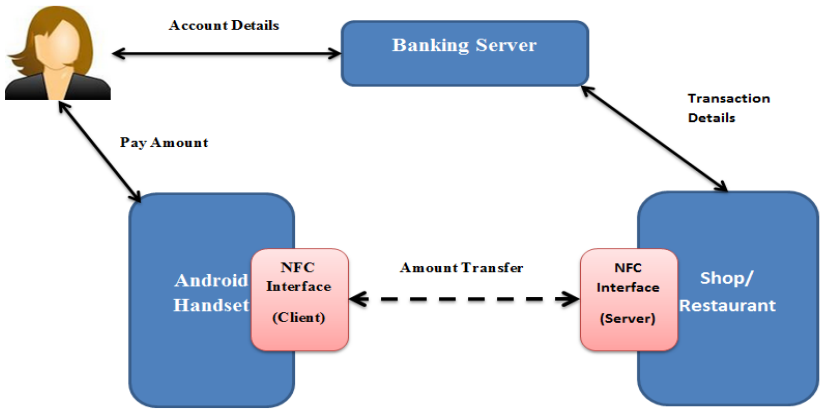

Fig.1: Flow of project

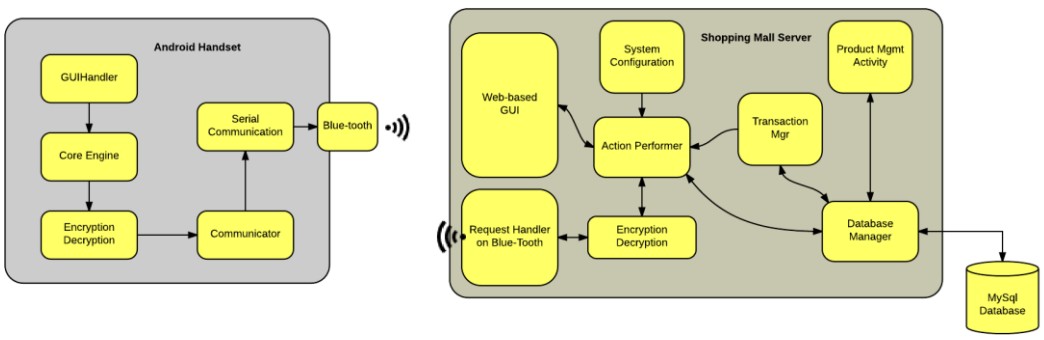

Fig.2: Internal System architecture

3. METHODOLOGY (DESIGN AND IMPLEMENTATION)

Needed at least 2 Android mobile devices with Bluetooth.

3.1 Assumptions and Dependencies

The user is expected to have Android Mobile phones and should be able to send and receive data when connected with Bluetooth. First on the Bluetooth of both device and pair with each other. Then transfer money from one mobile to another mobile. But for this keep both mobile close to each other .and for the best result keep the phone in the range up to 10 centimeter.

Hardware Requirement

- Processor – Intel Core2Duo, Pentium –III/i3
- Speed – 2.4 GHz
- RAM - 1 GB (min)
- Hard Disk - 50 GB
- Android phone with min 512 MB RAM or more.

Software Requirement

- Operating System : Windows 7
- Front End **:** Java
- Back End **:** MySQL
- Android OS 3.0 or more

3.2 External Interface Requirements

3.2.1 User Interfaces

3.2.1.1 Client Side (customer):

1. Credit Transfer home window.
2. Waiting for another device window.
3. Window illustrating an ongoing transaction.
4. Final window showing operation with success.

3.2.1.2 Server Side:

Shop/restaurant

1. Receiver window confirming a reception action.
2. Window illustrating an ongoing transaction.
3. Final window showing operation with success.

Bank

1. Window for creating new accounts.
2. Window for show proper message of money transaction

3. Window illustrating an ongoing transaction.
4. Final window showing operation with success.

3.3 Hardware Interfaces

Mobile application will get installed on mobile devices. These mobile devices should have Bluetooth and NFC chip thorough which it will connect to each other.

Software Interfaces

1. Database: MySQL 6.0.
2. Front End **:** Java
3. Android OS 3.0 or more

3.3.1 Communications Interfaces: Here we will be use Bluetooth and NFC chip to connect one mobile handset to another mobile. NDEF message is needed to allow the communication between devices. A NDEF message was created with a generic control RTD and it allows the application identification in each device. WIFI network and going to create our own communication protocol. Software will also support BASE64 encryption logic while sending data to server. Server will support HTTP protocol for web based access.

3.4 Functional Requirements

3.4.1 Mobile Client

- System should support Android handset
- System should have Bluetooth
- System should have NFC chip in handset.
- System should be able to search new device in the nearest network.
- System should have good or moderate transfer rate.
- System should show message windows like searching device.
- System should show message windows like pairing with this device.
- System should show message windows for transaction process.
- System should show message windows for transaction complete.

3.4.2 Server

Shop/restaurant

- System should support Android handset.
- System should have Bluetooth.
- System should have NFC chip in handset.
- System should be able to search new device and connect with required.
- System should show message windows like pairing with this device.
- System should show message windows for transaction process.
- System should show message windows for transaction complete.

Bank server

- System should create accounts for different user.
- System should provide connectivity to the user.
- System should allow user to transfer money.
- System should allow multiple transactions simultaneously.
- System should update all transaction properly.
- System should show message to the user of his/her money transaction.

- System should have to provide security that no other can access his/her account.
- System should have to transfer accurate money not less not more.

3.5 Non Functional Requirement

3.5.1 Performance Requirements: For good performance keep the device close to each other. The maximum distance allowed for NFC well work is ten centimeters.

***3.5.2 Safety and Security Requirements*:** In such application security is very important factor. Here we use on NFC technology. All the data will be shared with N DEF format The NFC data exchange format (NDEF) specification defines a data format to exchange information between two NFC enabled devices NDEF is a lightweight, binary message format that can be used to encapsulate one or more application, defining payloads of arbitrary type and size into a single message construct.

3.5.3 Software Quality Attributes

- It saves time
- It gives security.

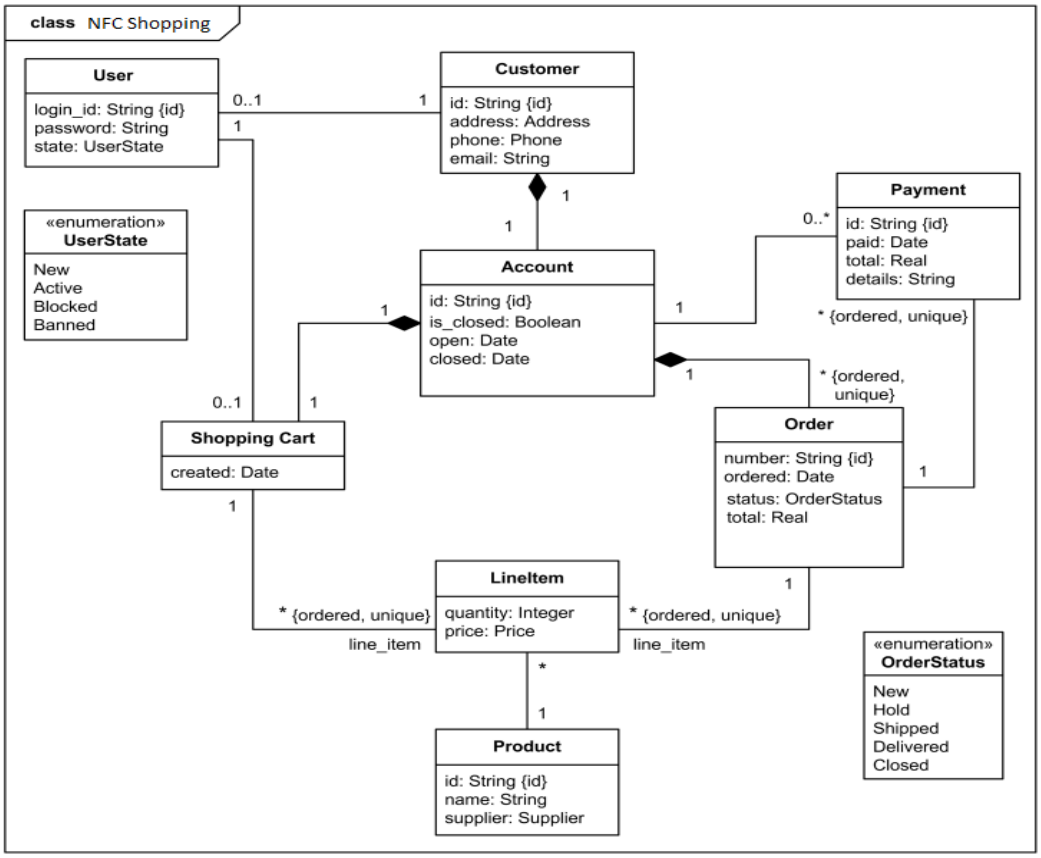

Fig.3: Class Diagram

4. CONCLUSION

Near field communication (NFC) is an efficient technology for making online payment. It provides a simple way to transfer different types of data between electronic devices. This technology is still at the beginning of the journey, it is still under development to become one of the most important techniques in the near future.

5. FUTURE SCOPE

- In bigger Shopping malls
- In Restaurants
- In any retail shop
- In the future, near field communication technology has the potential to become a staple of our daily lives, it will be adopted worldwide.

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