NFC Based Grocery Shopping

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Abstract— The work we have fulfilled in executing a E-Shopping component that empowers clients to pay bills for goods and other acquired things in a store through the means of a mobile phone, particularly a Smartphone Mobile Commerce Applications for an example, became the most popular applications for mobile users who do not want to trouble yourself with having to carry cash everywhere. The mode of exchange, as distant as communication between the customer's handset and the merchant's POS is concerned, we have chosen upon NFC (Near Field Communication). NFC innovation is a standards-based wireless communication technology that allows data to be exchanged between devices located a few centimeters apart, such as radio-frequency identification (RFID tags and readers). The model characterizes the issues and technologies involved in the processes, including service initialization, ordering, payment, shipping/collection, loyalty management, and customer service..

Index Terms— NFC, RFID, Mobile Phone, Tag , Reader,M-Commerce, Payment.

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1 INTRODUCTION

In this project we are proposing a shopping system with the help of NFC. Mall is a special environment. If you want to achieve the information query and purchase products with hassle free then NFC is the solution. We propose a system where the user can purchase products using NFC reader which are present in today's latest mobile design. Every products of the Mall will be marked with a NFC tag. The user simply scans the Tag with NFC reader which is available in his mobile phone. The tag transfer the information into the user mobile where the user can view the offers related to the products and can make decision whether to buy. On buying a automatic acknowledgement is given by the server where the bill are generated for the individual. After a hassle free shopping while exiting the Mall the server simply verifies the products purchased by the client and the data synchronized on the server network. If a proper matching is done the server service generates a invoice and sends SMS alert to the user registered mobile number. The user then can opt for Payment mode whether Pay by Cash or Cash on Delivery. The products are thereafter delivered to the user residents.

1.1 Scope of Project: -

This project aims at user who frequently visits Mall to buy products on weekly or monthly basis. User of the system downloads the Android application and install on their mobile NFC enabled devices. Every Mall will be having products with attached NFC tags. The User run the application on his mobile scans the NFC tags which are placed on the products. On scanning the Tags transfer some information to the user mobile. This Information carries the details of the product name, prize any offer etc. The user can select the product and enter the quantity he wants to purchase. The user makes payment electronically and a e-bill is generated on the user mobile devices. The user mobile phone data receive and transfer is controlled by a centralized server which is located at every local Mall centre.

2 TECHNICAL APPROACH

Near Field Communication (NFC) is a new wireless connectivity technology to the radius of short range, which evolved from the combination of contactless Identification and interconnection technologies (RFID). NFC operates at a frequency of 13.56 MHz and has a data transfer rate of up to 424 Kbps. Effective communication and optimal between two NFC-enabled devices occurs when they are at a distance of 0 to 10 cm. Simple movement as twist or swing will establish connections between devices and can initiate NFC, which will also be compatible with Bluetooth or Wi-Fi .NFC technology is a combination between the smartcard and reader that is planted in a single device, such as mobile phones or smart phones.With the NFC device planted on a mobile device, then the transaction activities such as retrieving information through NFC tags, micro-payments or payment transactions can be done by juxtaposing it to the NFC reader, which is in the user's mobile device and for payments at terminal point of sale (POS) at the location of the transaction.[9] With a feature like this then NFC referred to as device that supports the contactless transaction.

2.1 Tag and reader :-

NFC-based communication between two gadgets is conceivable when one gadget acts as a reader/writer and the other as a tag. Tag :- The tag is a thin simple device containing antenna and small amount of memory. It is a passive device, powered by magnetic field. Depending on the tag type the memory can be read only, re-writable, and writable once.

Reader :- The reader is an active device, which generates radio signals to communicate with the tags. The reader powers the passive device in case of passive mode of communication..

2.2 Operating Modes: -

NFC gadgets can work in three diverse modes based on the ISO/IEC 18092, NFC IP-1 and ISO/IEC 14443 contactless savvy card standards.

Read/Write: - In this mode, the NFC empowered phone can examine or compose information to any of the backed tag sorts in a standard NFC information format.[3]

Peer to Peer: - In this mode, two NFC-enabled gadgets can trade information. For case, you can share Bluetooth or Wi-Fi connect set up parameters to start a Bluetooth or Wi-Fi connect. You can too trade information such as virtual commerce cards or advanced photographs. Peer-to-Peer mode is standardized on the ISO/IEC 18092 standard.

Card emulation: - An NFC-enabled phone acts as reader when in contact with tags. In this mode, the phone can act as a tag or contactless card for existing readers.

3   SYSTEM ARCHITECTURE

Shopping system that will be built using hardware (equipment) Android-based phones [1-3] in which the integrated NFC technology. In general, explained that the user will do the shopping process with the help of the Android mobile phone with a system to process the Tap / Tag to goods to be purchased, the next Android NFC will record a shopping list that will be done[1].Users can perform editing of existing expenditure items such as the process of addition, subtraction or deletion. Furthermore, the user will confirm to the Merchant shopping for items to be processed so that the expenditure items should be recorded or should exist in the merchant and user history.[2]

General or global description of the process NFC transactions to be constructed are as illustrated in Fig. 1.
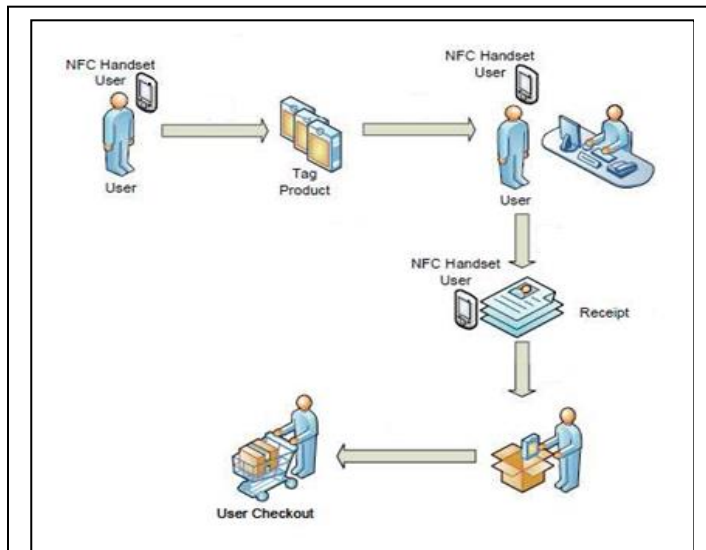

Fig.3.1 Flowchart of the proposed framework.

Description: The above flow chart represents the communication flow of the whole process of user; from user downloading the application , to using it on products, till the time of user checking out.[3]

Applications that will be created consists of two parts, namly the application of the User and Shopping Cart applications on the Merchant. Simulation system made only a prototype and not the Client-Server. Application on the user side can do somethings that :

1. Expenditures by doing tap / tags to an existing product shopping tag NFCnya that in planning this time using a Mifare 1K Card for NFC Tag.

2. See Balance in the user by setting the value of a balance of IDR. 1,000,000 (one million rupiah)

3. Record Shop, with this facility the user can perform and see the results of spending tag, and user can perform editing shopping results from the process of adding, reduction and elimination.

4. Shopping Log, with this facility the user can view the transaction history that has been done.

Application on Merchant side there are several functions that can be a merchant that is :

1. Transactions, serves to provide confirmation of the shopping process with the payment transaction process is also integrated in it, so for this process to occur connection / relationship between p2p users with a merchant to exchange information and confirmation.

2. Write Data, serves to make the process of writing or updating data on the product tag. So only the merchant who can perform the process of writing data in tag items / shopping items with the format prescribed.

3. Transaction logs, its function as a result of the log or record of the shopping process with detailed item information in goods spending, the amount of transactions and transaction status.

3.1 Payment Process :-

Versatile installments are too characterized as the handle of trading monetary esteem between two substances utilizing portable gadgets to pay for a item or benefit as in Figure, elective installment choices that customers are able to pay for items or administrations anyplace and anytime with the comfort of utilizing portable gadgets such as portable phones, or savvy phone.This framework proposes a secured and simple way of shopping installments utilizing versatile phone. QR Code is utilized as the thing tag which can be effortlessly checked and too gives point by point data with respect to the item.[4] QR code can give more data when compared to the standardized tag and NFC.

Above architecture diagram describes the flow of the payment system as follows, the customer on selection of the product scan the corresponding QR code using the mobile application. Now customer can add the item to their wish list which can be confirmed or cancelled before billing. After confirmation of the products to buy they can generate the bill using the mobile payment system using NFC technology. The customer can confirm the payment by clicking bill pay option from the mobile payment. The products selected could either be collected at the delivery counter or could be delivered to home if required.

3.1 UML DIAGRAM:

Figure 2 : UML Diagram: ADMIN SIDE (Activity Diagram)
Description: Above diagram shows the thorough process of what
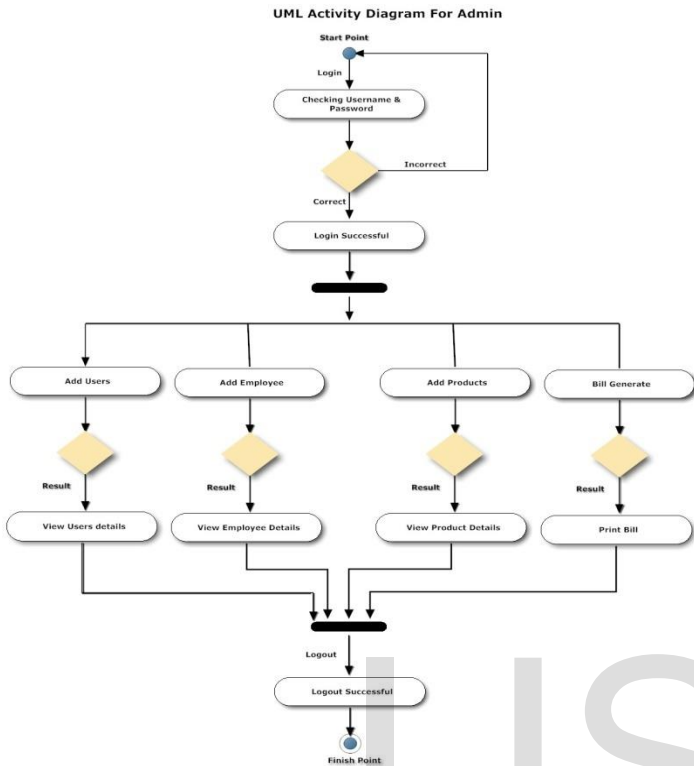
activities are to be performed by the admin side. It also gives all the validation details required.

Figure 3 : UML Diagram : CLIENT SIDE (Activity Diagram)
Description: the above diagram shows us the basic working process of how the user will use the application in order to
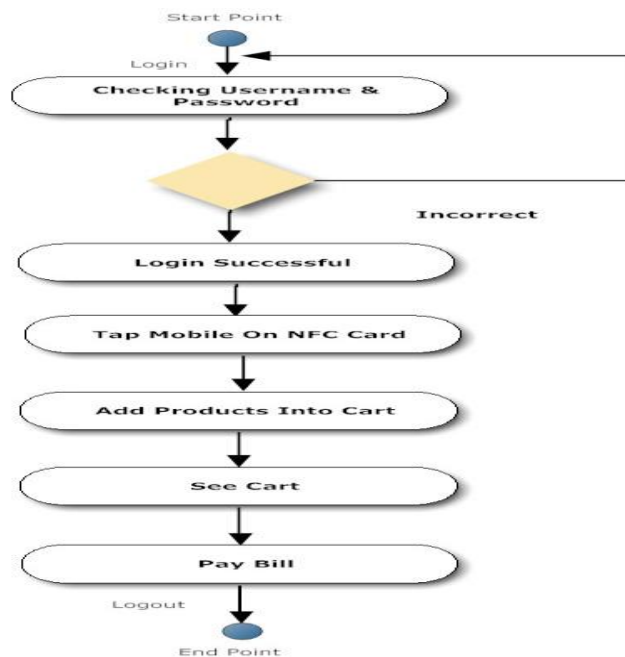
purchase grocery.

Once the facial bounding box (es) found using the Haar cascade classifiers were narrowed down to a single bounding box on the subject's face.

Results of various ROI selection options, including a nar-rower box, a box with the eyes removed, a box around the forehead, or a segmented face, may be seen in figure 4. The simplest ROI, name-ly the narrower bounding box that was used by Poh et al., usually contained mostly skin pixels for frontal images, although there was also sometimes hair or background appearing at the corners. When the subject tilted or turned their head, more background pixels become part of the ROI, as shown in figure 6.

The next step of the algorithm is to find the heart rate from the selected ROI pixels. As described in the technical approach, this process includes finding the mean RGB pixel values within the ROI for each frame and then normalizing across a 30-second window, ICA to extract independent source signals, and power spectrum analysis to determine the prominent frequencies.

4 END SECTIONS

4.1 RESULTS AND DISCUSSION

Implementation of the process of designing and manufac-turing of this study pure only utilize existing NFC technology on the Nexus S handset, so implementation of the processes carried out detailed spending data delivery and display on the merchant's process only in the Nexus S alone .

Implementation of data base for User SQLite databases are stored in the folder / data / data / / database from the An-droid device. So the position of the database: / da-ta/data/com.nfcteam.y2011/nfcteam2011.sqlite SQLite data-base name for the application process with NFC Shopping is "nfcteam2011.sqlite".

4.2 CONCLUSION

This application uses NFC technology to take input from the NFC enabled device. The application scans the NFC chips on which the device is tapped to and then makes changes in the application's input with the relevant information received from the NFC chips. The salient feature of this type of input is that it provides with quick results without any complex pro-cess of typing the input into the device. The application adds the product to the cart when it is tapped on the relevant NFC chip, the user can manually enter the quanti-ty of the product. This application is created with an intention to reduce the physical stress on the user and providing a has-sle free transaction. The user can set the address for delivering the products or can pick them at the time of placing order it-self. Payment methods can also be made available to the user through this application.

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