NFC TAGS-SMART WAY TO SHOP

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Abstract

Shopping will be a fun task if one goes to the mall or a supermarket and simply tap his/her phone on the products, and before he/she leaves the place, his /her purchased items along with the bill is ready at the counter or given an option, they will be delivered at home. Or in other scenario, when he/she enters, all the offers will popup in her/his phone for the items that they purchased last time. This paper is going to represent a peculiar method of doing shopping in a more comfortable way using an android based M-commerce applications. With the enhancement in NFC technology, the application is going to give customers a more handy and mainly time saving experience. The objective of this paper is to overcome the predicaments of long-established ways of shopping by involvement of NFC Technology to the system, No more queues at the exit gate, no more trolley based shopping, and mainly a time saving methodology. This paper will also give a brief idea on how this technology can further be used in future in predicting, billing and security. Further this paper will present data mining concepts that will help to improve both user customer and organization functionalities.

Index Terms: Android, M-Commerce, NFC, data mining

I. INTRODUCTION

M-commerce:

M-commerce abbreviation of (mobile commerce) is defined as way of doing business through wireless portable devices such as cellular telephone. M-Commerce allows the customers/sellers to get the access of Internet without actually finding a plug-in.Any kind of business deal having certain kind of financial value which can be handled through mobile automation networks is known as mobile-commerce. The type of transaction which is related to purchasing and selling of financial products, services or information over internet using cellular devices (Mobile Phone) is known as M-commerce.

NFC:

Near Field Communication (NFC) is a short-range wireless connectivity standard (Ecma-340, ISO/IEC 18092) that uses magnetic field induction to enable communication between devices when they're touched together, or brought within a few centimeters of each other. Operating at a frequency of 13.56 MHz it has a data transfer rate of up to 424 Kbps.

Just like Bluetooth and Wi-Fi, and all manner of other wireless signals, NFC works on the principle of sending information over radio waves. The technology used in NFC is based on older RFID (Radio-frequency identification) ideas, which uses electromagnetic induction in order to transmit information between two loop antennas located within each other's 'near field'. It uses an initiator and a target; the initiator actively generates an RF field that can power a passive target[1].
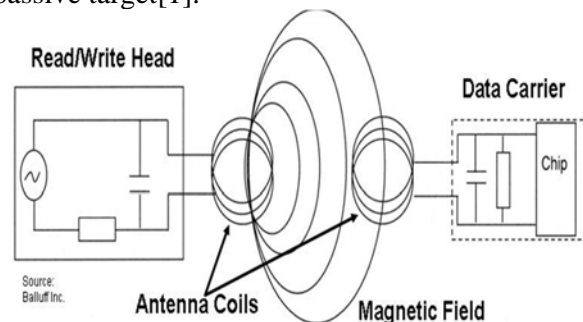

Fig. 1. NFC Coil Diagram

Fig. 2. NFC enabled phone should be tapped to NFC Chip

In this paper our aim is to use NFC Technology for m-commerce based shopping app. Making the user experience completely automated using mainly these 4 features:

- Login of customer through android app on NFC enabled phone.

- Walkthrough the store and put the desired items in the virtual cart on the app by mere tap on the product NFC card.

- Confirm order and dispatch it from the app to the cashier's web server.

- Automate billing at the cash counter and thereby increasing time efficiency.

II. WORKING OF NFC TAGS

NFC Tags contain small microchips with little aerials which can store a small amount of data so as to transfer it to another NFC device such as a mobile phone or a NFC based laptop. Different NFC Tags have different memory capacities according to which it stores the information. Information is stored in a specific data format (NDEF- NFC data exchange format) which can be read by most of the devices[2].

There are many apps available in the Play Store which supports to accumulate the data on NFC tags. Frequently used applications are:

1. NFC Task Launcher – great for creating smart phone profiles
2. NFC by Moo – works best with contact-related data, such as NFC business cards
3. TagStandWriter – many options to modify NFC tags, write, protect and erase data

If the device has NFC then the chip and Android Beam need to be activated so that you can use NFC:

1. Go to Settings > More.
2. Tap on the NFC switch to activate it. The Android Beam function will also automatically turn on.
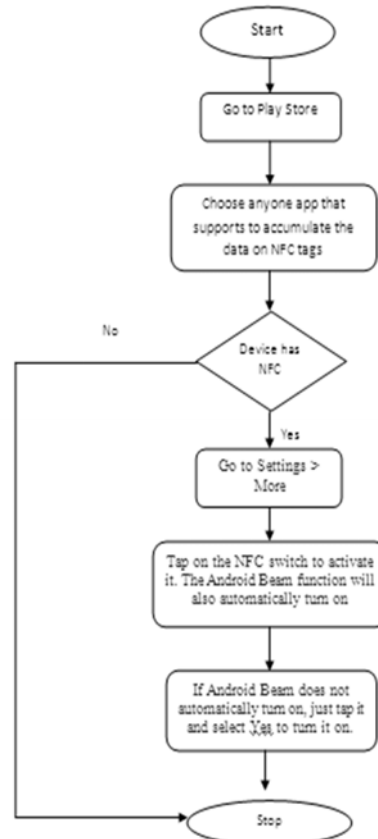3. If Android Beam does not automatically turn on, just tap it and select Yes to turn it on.

Fig. 3. Workflow for NFC Tag

III. METHODOLOGY

The application will be divided into two modules

- For Administrator and Employee: Developing a website that shall be used by the administrator and employee. The role of the administrator in the website is to add/manage employee details, add/manage customer details, and add/manage product details. The role of the Employee in the website would be to view the details of cart of customers by using unique customer ID i.e. Mobile Number. The employee also handles the transactions that are done after viewing the cart at the end of the shopping.

- For Customers: The customer should make use of NFC based mobile phone so as to run the app with an ease. The role of the

customer is to login the app while he enters the store. For new customer the employee will register the customer details and will provide the customer with the password that is generated on its mail account. The customer can login to the app and can use it now and later while visiting the store A virtual cart is displayed in which the customer can add, delete the desired product he wish to buy in the store. The customer can also change the quantity as per the need. When the shopping is complete the customer can view its virtual cart with the products and total cost displayed at the end[3].
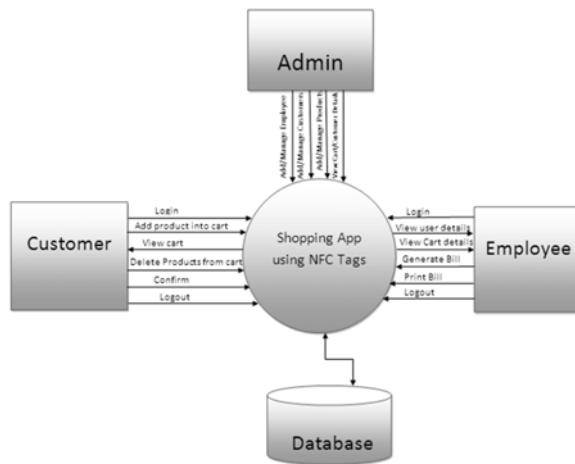

Fig. 4. Data Flow Diagram for Shopping APP

IV. ANALYSIS

In Existing systems, for the customer to buy products for monthly needs he can visit the mall, For which the customer goes to supermarket and takes either a trolley or a basket. Then they will check out different offers available on products. Depending upon their list of choice they pick up those items and place it in their basket or trolley. Sometimes it happens that if the numbers of products to be purchased are more, then number of trolleys might also increase. Even many a times if the weight of product is more so the customers need to hold those heavy products in their trolley for a longer time till the customer complete up their shopping. At the time of sales, the place is already crowded, and it becomes difficult for the person to move with the trolley in the store to search for the items. Lastly after putting all the items in the trolley one has to wait in the queues for so long for bill generation and billing.

V. PROPOSED SYSTEM

In our paper we are proposing an automated shopping system with the help of NFC technology. We contemplate a system where the user can purchase products using NFC enabled Smartphone. The products available in the mall will have a tag which shall contain a NFC chip holding all the necessary information about that product. The user has to simply scan the Tag with NFC reader which is his mobile phone by tapping over the tag. The information is transferred from the tag to the device in few seconds and thus customer can view all the details like price of the product, manufacturing date, expiry date, about manufactures and also if the product is in offer, thus a person can decide whether he wants to purchase it or not and accordingly add it to his virtual cart in an application[4].

VI. FUTURE SCOPE

Different features which can be added to the application such as prediction, billing and security.

Prediction: for prediction purpose data mining concept can be integrated with an application so the user's personal information can also be used to provide with wide range of offers for example if the user has certain health issues, then suggesting products they shall purchase. Details of users will be stored in database and then the system will suggest products for them also displaying calories per product, vitamins, proteins, carbohydrate amount for eatables.

Billing: With the development and advancements in NFC based payments, the same could be applied for the prototype application. NFC based payments could be used for the application. NFC based payments can ease the complications involved in a mobile wallet on consumer's phone and a similar wallet at merchant's end too since it establishes a direct connection between the two.

Security: Applications such as NFC Mobile Payment would utilize information that users want to keep private. Personal data and financial transactions must then be protected by the usage of NFC Secure Elements utilizing robust security concept similar to the security levels provided by certified credit cards. Although the communication range of NFC is limited to a few centimetres, NFC alone does not ensure secure communications. Applications particularly

dealing with payments may use higher-layer cryptographic protocols (e.g., SSL) to overcome potential threats such as:

1) Eavesdropping
2) Data modification
3) Relay attack
4) Lost property

VII. CONCLUSION

The project intents to create a software prototype .The software application will comfort the customers who regularly visit the mall. The customers can shop for their products in a relaxed and pleasant way. The benefit of NFC which is a short-range wireless technology is being used in this application. The advantage of using NFC technology over any other wireless technology is that it can be accessed and operated more easily and NFC tags are cheap and more durable.

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