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SMART SHOPPING SYSTEM ANDROID APPLICATION

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ABSTRACT

In today's life going to malls for shopping is increasing rapidly. People take the item and put it into trolley. After done with shopping they go for billing at the Billing counter but as there are many people standing in Queue for billing purpose, so lots of time is required for the individuals for billing because of existing barcode technology. To reduce this time, we are proposed a system based on NFC technology [5]. The system contains the items attached with NFC tag, android phone having NFC reader which reads the tag information when put into the trolley. Then this information is send to main billing server which calculates the total number of purchased items and sends the calculated bill to the device attached to trolley for displaying it on display of smart phone. Along with this system we are implementing an Android application for rewarding facility. The application is based on the trolley number and total number of purchased items.

Keywords— *Client/Server, NFC, Embedded System, Android mobile phone, NFC Reader, Productivity time, Supermarket, Bar code Scanner, Sensor.*

I. INTRODUCTION

The technology keeps improving in the smart phones. From the last few years, the mobile phones capabilities have been improved rapidly. Mobile phones are multiprocessing so they can work fast as a computer [4].

With the help of mobile payment, customer will speed up the transaction process and can check the balance, and if customer needed then add balance from their bank accounts. NFC (Nearest Field Communication) is used for the mobile transactions [5].

Earlier shopping was very much time consuming. The rapidly increasing use of online shopping reduced the load but still customer will prefer to buy product in supermarket to check the quality. In earlier the customers should wait in the long queue for the billing because cashier scan the barcode f each product so it will take more time to generate the bill.

Now a day every smart phone has facility of NFC reader. Most of the Smart phones are developed by the Android. It uses Dalvik Virtual Machine (DVM) for the execution of Java Byte Code [6].

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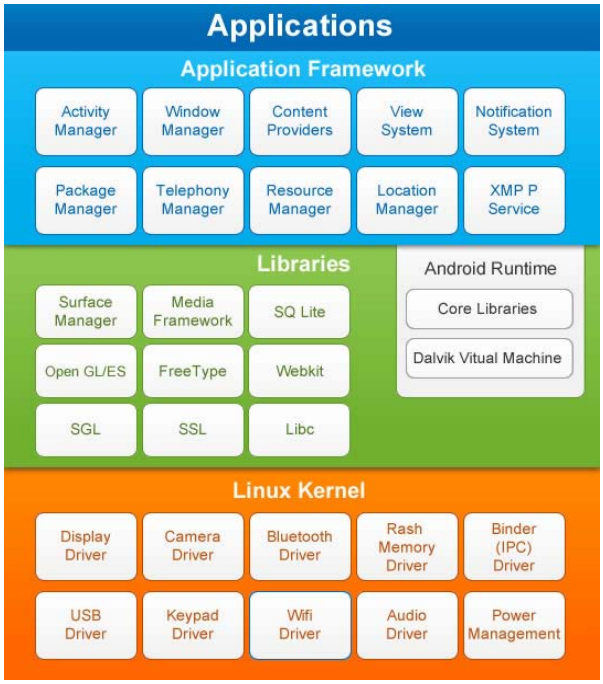

Figure: Android Layered Architecture

II. MOTIVATION

Our aim is to develop a system that can be used in industry or shopping malls to solve the challenges like long queue on counters. We firmly believe in making our environment a smarter and digitized.

III. GOAL AND OBJECTIVES

Overall goals and objectives of software is to eliminate time taken in billing counter in super markets and Increases customer satisfaction. It reduces manpower required in billing section. Increase productivity time. The objective of this software is to provide easy assistance to both the customer as well as the merchant with proper database and information.

IV. SYSTEM DESIGN

Our system is aimed to design the smart shopping in the malls. The customer can purchase different products in the mall after shopping customer must wait in the queue so to reduce that time our system is going to help. After purchasing each product customer can scan the product (i.e. NFC tag) via NFC scanner which is in built in the smart phone. The total is automatically done by the server. The server and the smart phone are connected via Wi-Fi.

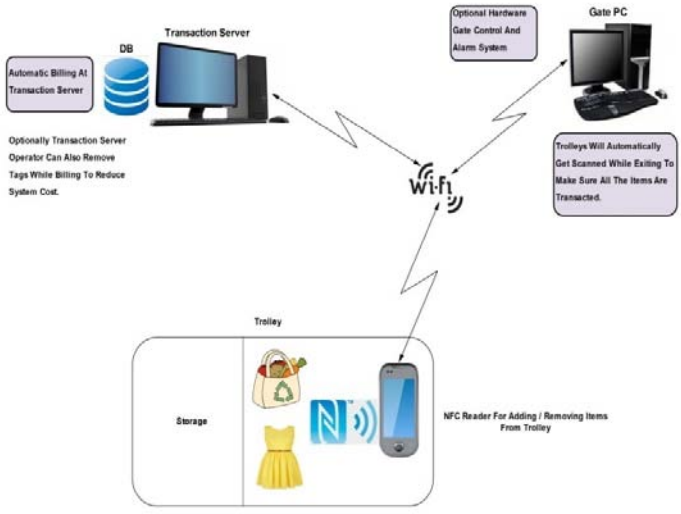

Figure-1: System Flow Diagram

The transaction server or shop owner can add, delete, update, modify the details of products. This application is smarter than previous shopping application.

V. MAJOR CONSTRAINTS

To execute the software, it is necessary that internet access is provided. The software is specially designed in a such a way that only the authenticate person can have permission to add, remove or modify user documents while user can only process them and if he/she wants to do any alteration the user needs to go to regional officer i.e. This are the major constraints of the software which is developed.

VI. APPLICATIONS

- Shopping Malls
- Big Bazar
- D-Mart
- Industry

In shopping malls or Big Bazar or any grocery store our application is going to use for reducing waiting time in the queue.

In many industries, there are many products are manufactured and these products are delivered across the different industries so these records of billing become very time consuming so time can be reduced by our application.

VII. MERITS

- Time required for billing is less.
- It reduces manpower required in billing section.
- Increase customer satisfaction.

VIII. DEMERITS

- If any customer not has smart phone, then he cannot use that our application.
- If customer is not literate, then customer will not possible to understand the application.

IX. MATHEMATICAL MODEL

S = {U, P, A, T, N, B, F, Success, Failure}
Let S be the system where,
U be the set of Users where,
U = {U1, U2, U3……Un}
P be the set of Products where,
P = {P1, P2, P3…….……Pn}
A be the set of Accounts where,
A = {A1, A2, A3……...An}
T be the set of Transactions where,
T = {T1, T2, T3……. Tn}
B be the set of Bills where,
B = {B1, B2, B3……Bn}
N be the set of NFC id where,
N = {N1, N2, N3……. Nn}
F be the set of Functions where,
F = {F1, F2……Fn}

- Add Product (): we can add product into the cart
- View Product (): Get list of all product
- Add Transaction (): Transaction done by customer
- View History (): Get history of product taken buy that user
- Add Balance (): Add balance to the customer account.

Success = The Desired output is generated,
i.e. The shopping is done and customer pays bill on mobile without waiting in the queue.
Failure = The desired output is not generated,
i.e. The payment is not done on mobile application.

X. MODULES

Module Name : Database Create		
Action	**Input**	**Expected Output**
Select Dataset	Upload Action	Dataset Upload Successfully
Result : Success		

Module Name : Database Create		
Action	**Input**	**Expected Output**
Create Android Apps	Android Apps	Android Apps Created Successfully
Result : Success		

- Admin
- Cart
- Client
- Gateway PC

XI. RESULT AND PERFORMANCE ANALYSIS

Admin module is the main part of the system where we register our product by the NFC reader application. Each product has NFC tag so that NFC reader read that tag and generate unique id for each product. Then Admin will submit the details of that product and product get registered.

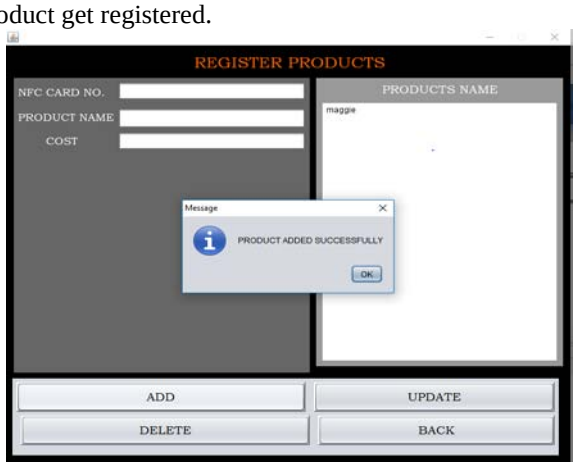

Figure: Admin Module

Cart module is an important part of the system. It is developed in the android. This application is attached with cart. The unique id is provided to the whenever customer wants to start shopping customer will click on start button then customer scan the each product and the information related to that product i.e. cost and name of the product is displayed on the screen. If customer does not want that product then customer will rescan the same product so it is automatically removed from the cart. Finally customer done with shopping customer will click on stop button and the bill gets generated on the cart application.

Figure: Cart Application

Client application is another application which is available on customer's phone and used by the customer. The client application provides facility to pay the bill of customer generated by the cart application. The client application asks the unique id of each customer and then it will display the items purchased by the customer. If the customer is not having balance in his/her account then customer will add the balance.

Figure: Client Application

Gateway PC is the most important module in our system, which is placed on the exit door. The Gateway PC checks weather the bill paid by customer are equal to the items purchased by the customer. Gateway PC checks weather the particular product is billed by the customer or not and if not then it generates the alarm.

XII. FUTURE SCOPE

The future of the system is very bright and progressive as it key to cost saving and efficient management. Moreover the scope can be expanded even more with slight modification in following parameters like list generation and providing guided shopping, Smart shelves and on screen advertising with isle location racking system.

XIII. CONCLUSION

As Smart phones become more and more popular in today's life, we are reducing efforts through smart devices and smart phones. With the help of NFC reader in the smart phone customer can scan the NFC tag of the item to be purchased and add product directly into the cart. The most important advantage of this application is that we don't need to stand in the queue for scanning the product. The different products purchased by the customer will be maintained in the application. The automatic bill gets generated after the shopping. The customer can pay bill by online and if customer don't have balance in the account customer can add balance via bank account.

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