Smart Shopping Application Using QR Code

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Abstract: **An Innovative Product With Societal Acceptance Is The One That Aids The Comfort, Convenience And Efficiency In Everyday Life. Purchasing And Shopping At Big Malls Is Becoming Daily Activity In Metro Cities. We Can See Big Rush At These Malls On Holidays And Weekends. People Purchase Different Items And Put Them In Trolley. After Completion Of Purchases, One Needs To Go To Billing Counter For Payments. At Billing Counter The Cashier Prepare The Bill Using Bar Code Reader Which Is Very Time Consuming Process And Results In Long Queue At Billing Counter. In This Paper, We Discuss A Product "Smart Trolley In Mega Mall" Being Developed To Assist A Person In Everyday Shopping In Terms Of Reduced Time Spent While Purchasing. The Main Objective Of Proposed System Is To Provide A Technology Oriented, Low-Cost, Easily Scalable, And Rugged System For Assisting Shopping In Person.**

Keywords: **Smart Trolley, Innovative Product, Big Malls, Metro Cities, Big Rush, Billing Counter, Technology Oriented, Low-Cost, Easily Scalable.**

I. INTRODUCTION

In the wake of arranging occupied supermarket aisles, you frequently need to pick the line you think will move speediest to stand a possibility of getting your shopping home before the frozen yogurt liquefies. Now a days shopping at big malls is becoming a daily activity in most of the cities. We can see huge rush at malls specially on holidays and during weekends. The rush is even more when there are special offers and discount. People purchase various items and put them in trolley. After total purchase one needs to go to the billing counter for their payments. At the billing counter the cashier prepare the bill using bar-code reader which is particularly tedious process that outcomes in long lines at billing counters. But this time-consuming ritual may become a thing of the past thanks to smart shopping application in the hands of the user. Our aim is to develop a system that can be used in shopping malls to solve the above-mentioned challenge. The system will be placed in all the smart phones. It will consist of a QR-Code reader. All the products in the mall will be equipped with QR-Codes. When a person scans any product, and puts it in the trolley, its code will be detected and the price of those products will be stored. Thus, the billing will be done in his application itself. Item name and its cost will be displayed on his smart phone.

In the modern world, every supermarket employs shopping baskets and shopping trolleys in order to aid customers to select and store the products which they intend to purchase. The customers have pick and drop every product which they wish to purchase into the shopping cart and proceed to checkout at the billing counter. The billing process is exceptionally tedious.

II. PROBLEM DEFINITION

In today's accelerating world, shopping at malls or supermarkets have become lifesaver for people, if time is concerned as one of the important factors. Innovation in technology is basically aimed towards making day to day life of people easier and faster. In metropolitan cities, we see big rush at malls on holidays and weekends. People buy different products and put them in trolley. After completion of selecting the goods, one needs to go to billing counter for payment. There the price on each product encoded in barcode tag is read and the bill is prepared. This is very time consuming and results in long queue at counter.

System is developed to help a person in everyday shopping in terms of reduced time spent while purchasing. The main objective of proposed system is to provide a technology oriented, low-cost, easily handled, and efficient system for assisting shopping in person.

The proposed system has following important modules:

1. Android Application for displaying shopping and billing details

2. Transreceiver for achieving wireless communication with server

In this project, we discuss in detail system design, working, testing and conclusions. In conclusions we discuss about advantages and disadvantages of proposed system. The Smart Shopping has the potential to make the shopping experience more pleasurable and efficient for the shopper and the inventory control easier for the store management.

III. LITERATURE SURVEY

While doing survey we found that most of the people prefer to leave the shopping mall instead of waiting in long queues to buy a few products. People find it difficult to locate the product they wanted to buy, after selecting product they need to stand in a long queue for billing and payment. To try to solve the problems previously identified, recent years have seen the appearance of several technological solutions for hypermarket assistance. All such solutions share the same objectives: save consumer's time and money, help the retailers to win loyal clients.

One system is designed i.e. the Web shopping cart system as a typical client-server application on the Web. Then they clarified several problems on the implementation of the Web shopping cart system, which are peculiar to the Web. In order to solve the problems, proposed a new mechanism that can manage user sessions with high reliability and safety. It is compared the Web shopping cart system implemented using the proposed mechanism with the one developed by the conventional methods.

One more system is proposed, an automatic embedded software generation framework that can create and evolve Zigbee applications. The framework consists of two major modules, pattern extraction and code generation. Pattern extraction and development are designed to provide Zigbee application with model reuse and modification. SysML serves as a medium between pattern development and code generation. A smart shopping cart application has been implemented using this pattern based software framework.

	QR Code	NFC/RFID
Availability in mobile phones	High: Any camera-enabled mobile phone, several include preinstalled readers.	Low: Only NFC-enabled devices
Cost	Low: Tags can be printed in any printer, using common paper	Medium/High: Depends on the NFC/RFID tag or smartcard to be used.
Users Learning Curve	Low: Most users are already familiar with mobile cameras.	Medium: Users require learning NFC basis.
Security	Low: Information can be read easily by any camera-enabled device.	High: Devices must be very close to read information
Storage capacity	High	High
Damage resistance	Medium: QR Code includes error correction data that allows up to 30% recovery of a distorted or damaged tag.	Low: If wires are damaged tag cannot be read.
Visibility requirement	High: Code must be visible and well illuminated.	None: Tags can be hidden.

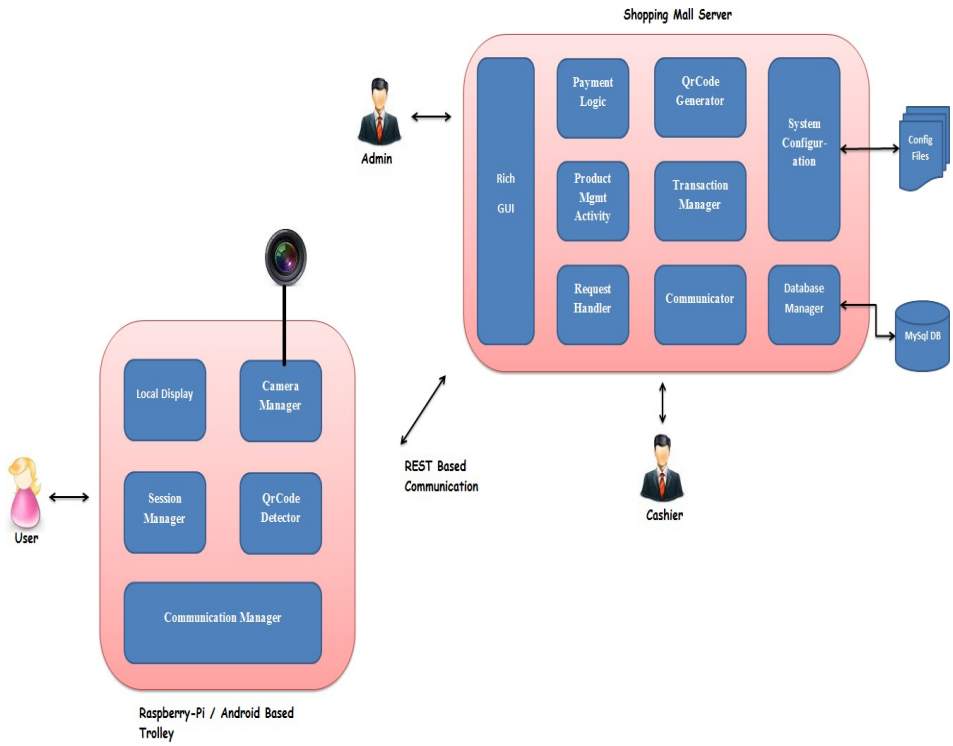
IV. SYSTEM REQUIREMENTS

• Hardware Requirements

1. Processor – Intel Core2Duo, Pentium –III/i3
2. Speed – 2.4 GHz
3. RAM - 1 GB (min)
4. Hard Disk - 50 GB
5. Keyboard and Mouse
6. Microcontroller
7. Android OS Smartphone

• Software Requirements

1. Operating System : Windows 7, Linux, Android OS
2. Front End : Java 7, Android
3. Back End : MySQL 6
4. Tomcat 7
5. JDK 1.7
6. Eclipse Indigo



V. SYSTEM ARCHITECTURE

The smart application integrates a Shopping cart and QR code scanners placed on each product – and QR code Scanner at the entry and exit points respectively. It facilitates the user to self-scan the QR code of the products purchased. Wrong entries can be corrected by making use of the functionality delete in the application from addition of products to removal of products and activates the other QR code scanner at the opposite end.

A wireless smart-device makes note of all the scanned commodities of each and every user (with allotment number) ; and is linked with the Supermarket's backend database which contains all the details of the products such as Cost Price, Available Stock. The scanned products are automatically billed in the wireless smart device for their purchases, thereby significantly reducing turnaround time and reducing and transmitted to the Shop's central Billing program. System will generate a bill then hen client will pay the bill and take out every one of their items and place them into shopping cart during the checkout process.

VI. OTHER SPECIFICATIONS

- **Advantages**

1. Reduces manpower required in billing section. This can reduce the expenses incurred by the management.
2. Users can be aware of the total bill amount during the time of purchase.
3. Reduces time spent at billing counter and Increases customer satisfaction.

• Disadvantages

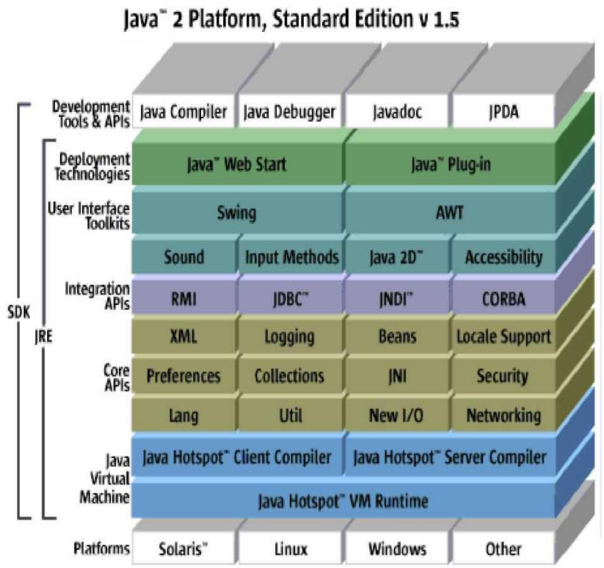
1. Expensive to implement on large scale. Henceforth, difficult for small scale vendors to implement.
2. Dependency on android mobile phone

• Applications

Useful in Shopping Malls

• Technologies Used

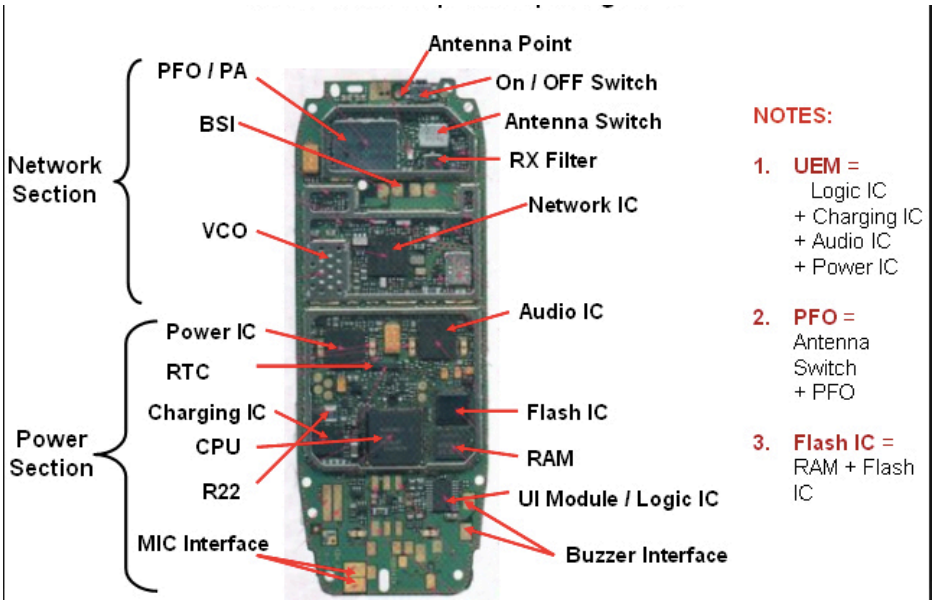
Java:



Java was developed at Sun Microsystems. Work on Java initially began with the goal of creating a platform-independent language and OS for consumer electronics. The original intent was to use C++, but as work progressed in this direction, developers identified that creating their own language would serve them better. The effort towards consumer electronics led the Java team, then known as First Person Inc., towards developing h/w and s/w for the delivery of video-on-demand with Time Warner.

Unfortunately (or fortunately for us) Time Warner selected Silicon Graphics as the vendor for video-on-demand project. This set back left the First Person team with an interesting piece of s/w (Java) and no market to place it. Eventually, the natural synergies of the Java language and the www were noticed, and Java found a market. Today Java is both a programming language and an environment for executing programs written in Java Language. Unlike traditional compilers, which convert source code into machine level instructions, the Java compiler translates java source code into instructions that are interpreted by the runtime Java Virtual Machine. So unlike languages like C and C++, on which Java is based, Java is an interpreted language.

Android App



The ANDROID motherboard is a credit card sized computer. It's like a little PC which can be used for many of the things that your other smart phones does, like Application, word processing and games. It also plays high definition video. The design is based around a Qualcomm MSM8996 Snapdragon 820 - G9350
Exynos 8890 Octa - G935FD, Quad-core (2x2.15 GHz Kryo & 2x1.6 GHz Kryo), Video Core IV GPU, and 8 gbyte of RAM. It includes a 12-megapixel rear camera and an extendable microSD card long-term storage.

Features:

- More Energy Efficiency (Less Power Required)
- Improved Power Management: Manage More Devices from Your Pi!

Specifications:

- 150.9 x 72.6 x 7.7 mm (5.94 x 2.86 x 0.30 in)
- Chip: Qualcomm MSM8996 Snapdragon 820 - G9350
  Exynos 8890 Octa - G935FD,
- CPU: Quad-core (2x2.15 GHz Kryo & 2x1.6 GHz Kryo) - G9350
  Octa-core (4x2.3 GHz Mongoose & 4x1.6 GHz Cortex-A53) -
- GPU: Adreno 530 - G9350

Mali-T880 MP12 -

- RAM: 8 gb
- Storage: Micro SD
- Audio: Stereo from 3.5 mm jack
- Operating Systems: Android 6.0 (Marshmallow),can be upgradable to 7.0 (Nougat)
- 12 MP (f/1.7, 26mm, 1/2.5", 1.4 µm, Dual Pixel PDAF), phase detection auto-focus, OIS, LED flash
- Super AMOLED capacitive touchscreen, 16M colors
- Power Source: Alternate current

CONCLUSION AND FUTURE SCOPE

- Taking into account the changing trend in retail shopping we come to a conclusion that the Intelligent Shopping Application is most certainly a definite necessity for the Retail marketing industry to step up their portfolios, cope up with the advancement in technology and save time and manpower. The future implications of the proposed system are very promising considering the amount of time and resources that it saves. The system can be upgraded to include interfacing with GSM which will help to get information about transaction directly via web on smartphone. Also, the transaction and billing system can be linked with bank account of individual user to make direct payment provided that security issues are being taken care of. Also, the Smart application can be further designed to search products in shelves and guide the user accordingly to the position of the exact product.

REFERENCES

[1] Raju Kumar, K. Gopalakrishna, K. Ramesha on “Intelligent Shopping Cart” in International Journal of Engineering Science and Innovative Technology (IJESIT) Volume 2, Issue 4, July 2013

[2] Kindiling And Perception Of Qr-Images Using Raspberry-PI 1P.V.Vinod Kumar, 2K.Dhanunjaya- International Journal Of Engineering And Computer Science ISSN:2319-7242 Volume 4 Issue 7 July 2015, Page No. 13082- 13085

[3] International Journal of Computer Applications (0975 – 8887) International Conference on Communication, Computing and Information Technology (ICCCMIT-2014)

[4] A QR Code-Based on-Street Parking Fee Payment Mechanism, IEEE 2014

[5] An Unhackable QR Code to Fight Bogus Chips, IEEE 2013

[6] Indias Largest Malls - 2010, asipac, Mar 2010, [Research Studies On Malls in India].

[7] Ankit Anil Agarwal, Saurabh Kumar Sultania, Gourav Jaiswal and Prateek Jain on RFID Based Automatic Shopping Cart in Control Theory and Informatics; ISSN 2224-5774 (print) ISSN 2225-0492 (online),Vol 1, No.1, 2011

[8] J.Awati and S.Awati, Smart Trolley in Mega Mall, in International Journalof Emerging Tech- nology and Advanced EngineeringWebsite: www.ijetae.com (ISSN 2250-2459, Volume 2, Issue 3, March 2012)

[9] Raju Kumar, K. Gopalakrishna, K. Ramesha on Intelligent Shopping Cart in International Journal of Engineering Science and Innovative Technology (IJESIT) Volume 2, Issue 4, July 2013

[10] L. Yew, L. Fang, C. Guancheng, C. Jianing, and L. Hangzhi, RFID: Smart Shopping for the future, Singapore Management University, Tech. Rep.

[11] Arbaaz khan, Aadil Siddique, Jasmine Khan, Zeeshan Khan & Amit Zore, Smart Trolley Using QR code