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Smart Trolley 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

After negotiating busy supermarket aisles, you often have to pick the queue you think will move fastest to stand a chance of getting your shopping home before the ice cream melts. Now days purchasing and shopping at big malls is becoming a daily activity in metro cities. We can see huge rush at malls on holidays and weekends. The rush is even more when there are special offers and discount. People purchase different items and put them in trolley. After total purchase one needs to go to billing counter for payments. At the billing counter the cashier prepare the bill using bar code reader which is a time consuming process and results in long queues at billing counters. But this tedious ritual may become a thing of the past thanks to sensors embedded into the wheel of trolleys. 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 trolleys. It will consist of a QRCode reader. All the products in the mall will be equipped with QR-Codes. When a person puts any products in the trolley, its code will be detected and the price of those products will be stored. Thus the billing will be done in the trolley itself. Item name and its cost will be displayed on local display.

In the modern world, every supermarket employ shopping baskets and shopping trolleys in order to aid customers to select and store the products which they intend to purchase. The customers have to drop every product which they wish to purchase into the shopping cart and then proceed to checkout at the billing counter. The billing process is quite highly time consuming.

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. LCD interface for displaying shopping and billing details

2. Raspberry-pi hardware for scanning QR code of the product

3. 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 trolley 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.

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	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. Raspberry Pie hardware

- **Software Requirements**

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

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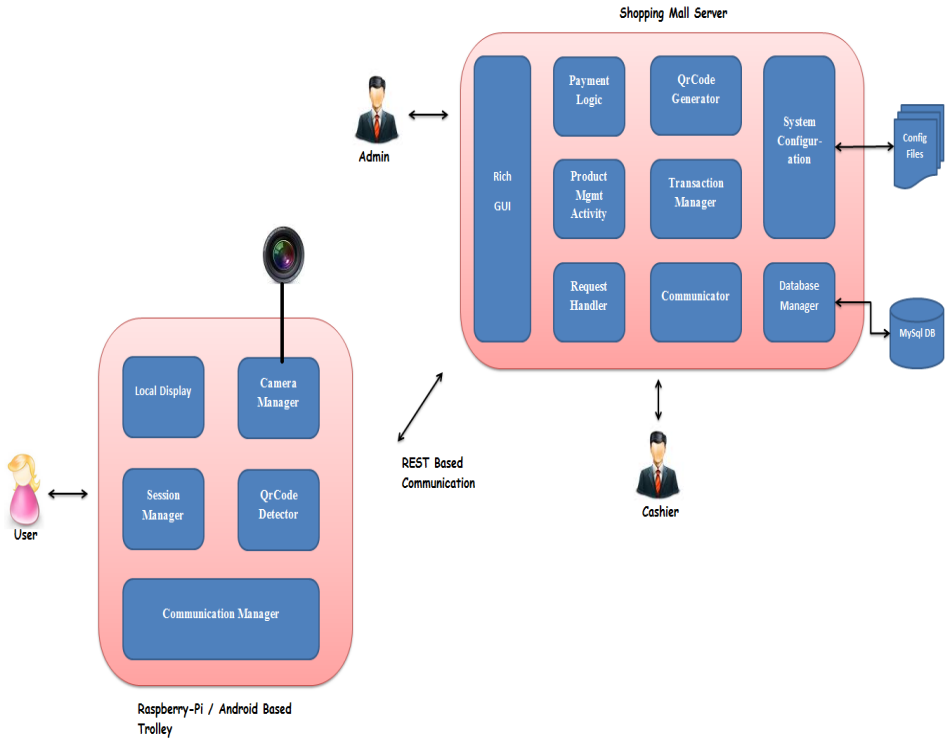
V. SYSTEM ARCHITECTURE



The smart trolley system integrates a Shopping cart (trolley) with 2 sets of QR code scanners placed at 2 different checkpoints – the entry and exit points respectively. It facilitates the user to self-scan the QR code of the purchased products which he intends to purchase. Wrongful entries can be corrected by making use of a keypad that changes the functionality of the machine 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 the particular trolley (with allotment number) ; and is linked with the Supermarket's backend database which contains 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 user will pay the bill and take out all their products and place them into carry bags 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

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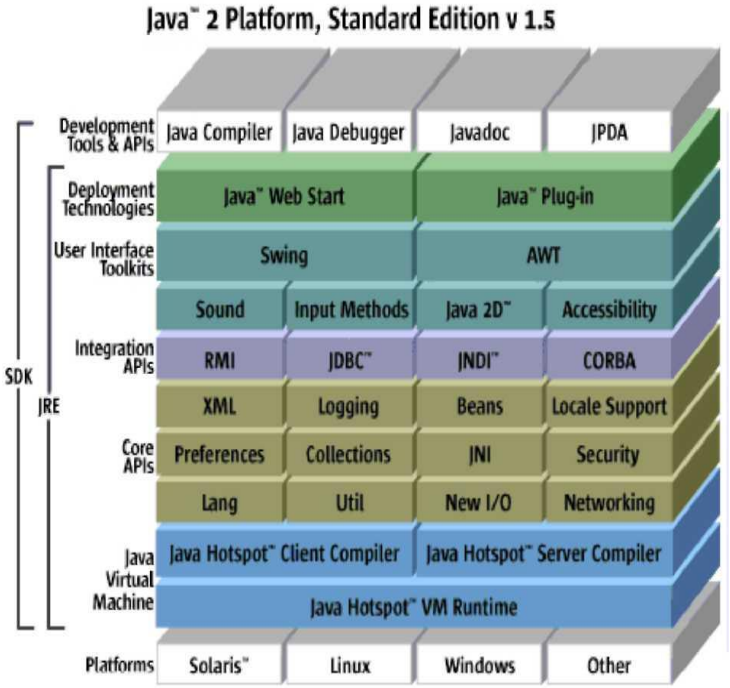
- **Technologies Used**

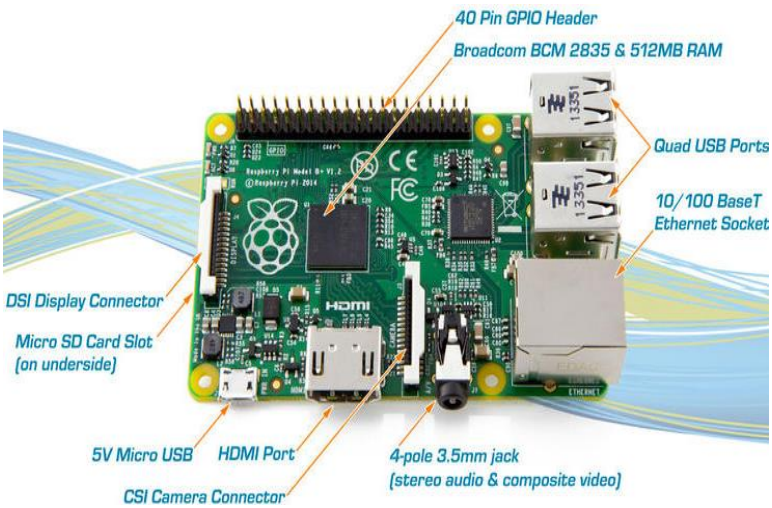
Java:



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.

Raspberry-pi:



The RASPBERRY PI Model B+ is a credit card sized computer. It's like a little PC which can be used for many of the things that your desktop PC does, like spreadsheets, word processing and games. It also plays high definition video. The design is based around a Broadcom BCM2835 SoC, which includes an ARM1176JZF-S 700MHz processor, Video Core IV GPU, and 512Mbytes of RAM. The design does not include a built in hard disk or solid state drive, instead relying on a microSD card for booting and long term storage. This board can run several flavors of Linux and is being used to teach kids all over the world how to program.

Features:

- More Energy Efficiency (Less Power Required)
- Improved Power Management: Manage More Devices from Your Pi!
- Bigger and Better projects via an Expanded GPIO Header (40 pins vs. 26)
- Increased connectivity - 2 Extra USB ports (making a total of 4) and a new 4-pole connector replace the existing analogue and composite video port on the Model B.

Specifications:

- Dimensions: 85mm x 56mm
- Chip: Broadcom BCM2835 SoC full HD multimedia applications processor
- CPU: 700 MHz Low Power ARM1176JZ-F Applications Processor
- GPU: Dual Core Video Core IV® Multimedia Co-Processor
- RAM: 512 MB SDRAM @ 400 MHz
- Storage: Micro SD
- USB 2.0: 4x USB Ports
- Ethernet: 1x 10/100mb Ethernet RJ45 Jack
- Video Connections: HDMI, Composite RCA (shared with audio jack)
- Supported Resolutions 640×350 to 1920×1200, including 1080p, PAL & NTSC standards
- Audio: Multi-Channel HD Audio over HDMI, Stereo from 3.5 mm jack
- Operating Systems: Raspbian, RaspBMC, Arch Linux, Risc OS, OpenELEC, Pidora
- Power Draw / voltage: 600mA up to 1.8A @ 5V
- GPIO 40
- Other Connectivity: 1x CSI-2 for Raspberry Pi camera modules
- 1x DSI for Raspberry Pi displays
- Power Source: 1x Micro-USB

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.