

Automated Shopping Trolley for Super Market Billing System

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ABSTRACT

The Automated Shopping Trolley is a Smart Trolley which integrates a Raspberry Pie Embedded Chip with two Bar code Scanners and a Battery kit to allow users to self checkout at Super Markets.

Keywords

Supermarket, Bar code Scanner, Sensor

1. INTRODUCTION

In the modern world, every supermarket and hypermarkets 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 tedious and highly time consuming and has created the need for shops to employ more and more human resource in the billing section, and yet waiting time remains considerably high. In this paper, we seem it fit to propose the “Intelligent Shopping Basket” which aims to reduce ,and possibly eliminate the total waiting time of customers, lower the total manpower requirement and expenses for markets and increase efficiency overall. In a world where technology is replacing the ways we pursue everyday activity, the future of the retail industry also lies in more and more automated devices.

2. OBJECTIVE

The main objective of this project is to reduce and eliminate time taken in billing counter in super markets by designing an Intelligent Shopping Basket which uses Barcode scanners to allow users to self-checkout and increase productivity time.

3. PROJECT METHODOLOGY

- The Automated Shopping cart system integrates a Shopping cart (trolley) with 2 sets of barcode scanners placed at 2 different checkpoints – the entry and exit points respectively. It facilitates the user to self-scan the barcode 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 barcode 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,

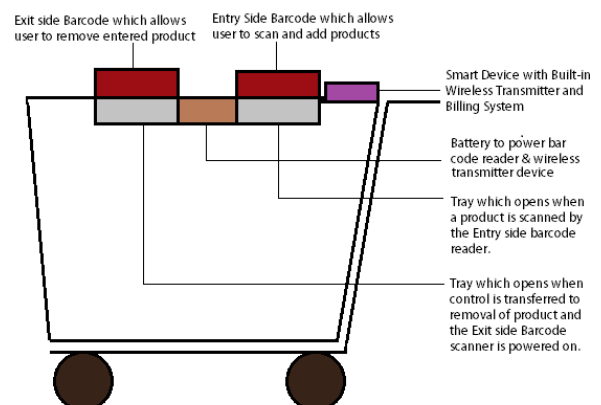
Available Stock. The scanned products are automatically billed in the wireless smart device for their purchases, thereby significantly reducing turnaround time and reducing and transmitted to the Shop's central Billing program. By this mechanism, the time consuming work of scanning and billing every single product at the cash counter can be avoided. Users can then make use of the counter to pack and pay labour time which has become a real problem in the modern era.

The tray in which the two barcode scanners are embedded is fitted with a lock and keys for which are with the people at the billing section. This allows users to take out all their products and place them into carry bags during the checkout process.

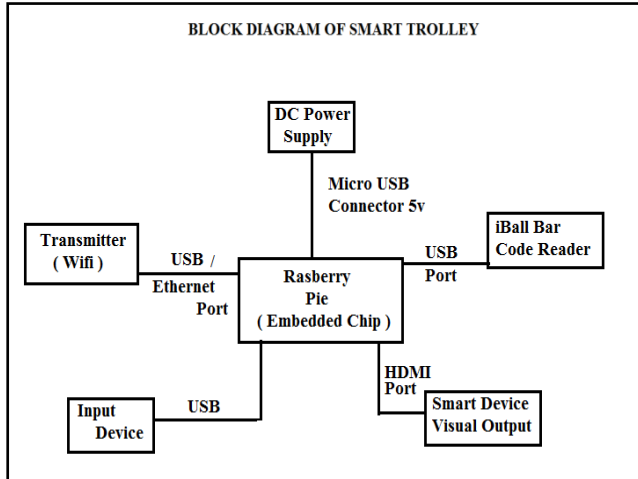
4. WORKPLAN

- The Embedded chip which controls the entire operation is the Raspberry Pi
- An Android OS (Version 4.4 – Kitkat) is installed on the chip
- A mini 4 inch Touch Screen LCD monitor is integrated with the Raspberry Pi
- 4 Two iBall Barcode Scanners are connected and installed with the Raspberry Pi Embedded Chip
- Using Eclipse SKD, a GUI based android application is coded.
- The barcode values are preloaded into a central database and the coded Application access these values using a wireless network.
- A 100V battery kit powers the Raspberry pi and the LCD monitor.

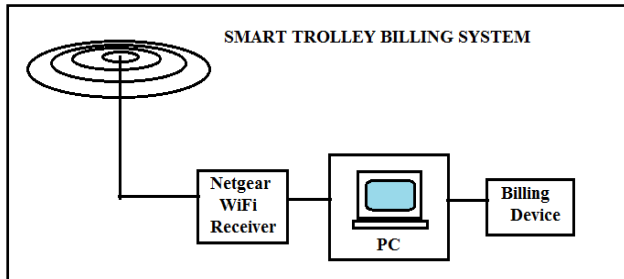
5. VISUAL ABSTRACT



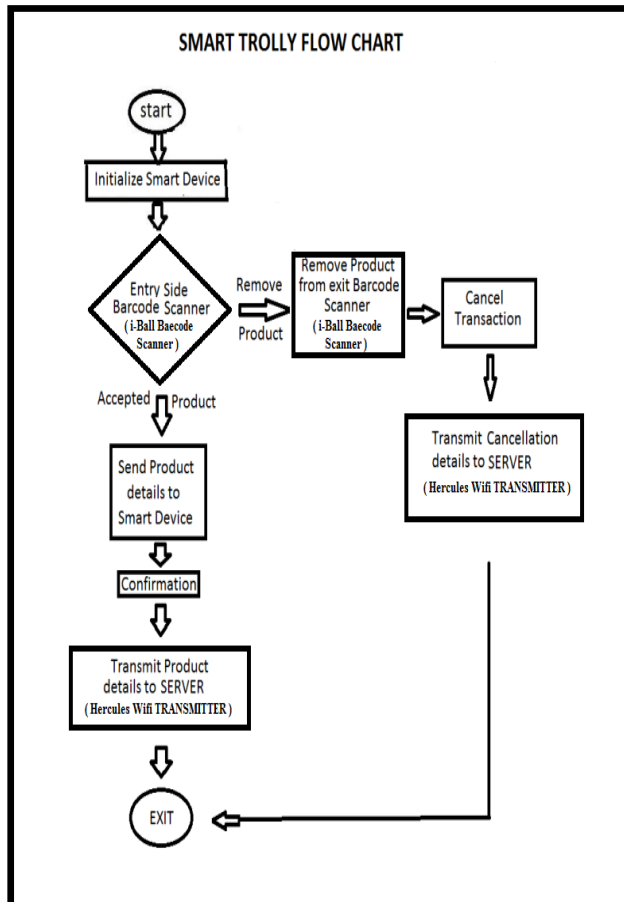
6. BLOCK DIAGRAM



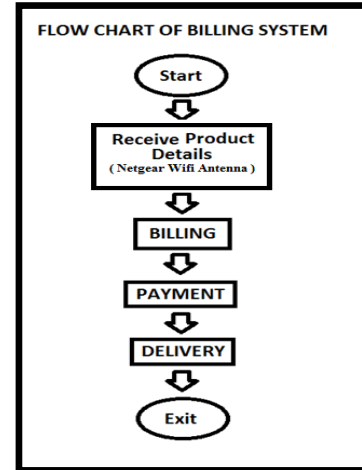
7. BILLING SYSTEM



8. FLOWCHART OF SMART TROLLEY



9. FLOWCHART OF BILLING SYSTEM



10. HARDWARE REQUIREMENT

| No | Component Name | Quantity |
|-------|-------------------------------------|----------|
| 1 | Raspberry Pie Embedded Chip | 1 |
| 2 | Iball Barcode Scanner | 2 |
| 3 | 100V Battery Kit | 1 |
| 4 | 4 Inch LCD Screen For Raspberry Pie | 1 |
| 5 | USB wifi Device | 1 |
| 5 | Customised Trolley | 1 |
| Total | | |

11. SOFTWARE REQUIREMENT

- Android 4.4 Kitkat (Open Source)
- Eclipse Android SDK (Open Source)
- Iball Barcode Driver

12. ADVANTAGES

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

13. DISADVANTAGES

- Expensive to implement on large scale. Henceforth, difficult for small scale vendors to implement.
- Requires constant battery backup. This requires constant care as customers tend to get upset when the find their trolley runs out of power during the middle of their shopping routine.

14. CONCLUSION

Taking into account the changing trend in retail shopping, we come to a conclusion that the Intelligent Shopping Basket 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.

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