An Automated Cart System for Inventory Management with Theft Recognition Feature

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Abstract: This paper recommends smart cart architecture for providing an automatic billing system, anti-theft balancing system and web application which provide inventory management. It is accomplished using "RFID" and "Wi-Fi technology" on an airframe system which is an open-source network cloud platform. Results indicate that the moment invested during shopping is reduced by 26 percent relative to standard purchasing techniques.

Keywords: Anti-theft system, Automated billing, RFID, Smart trolley, Wi-Fi

INTRODUCTION

The current advancement in the field of chip production has suggested some practical methods for fresh inventions[1]. Barcode-based scans lead to time loss and can be achieved through the use of "RFID" tags for each item and by using compact and safe RFID scanners[2]. An IoT based smart trolley with RFID tag and an ESP unit is discussed in document [3][4] The population involved in budget purchasing is discussed in paper[5][6]. Authors in the paper [7] deliberated about the elements required by RFID, RFID reader name, EEPROM, Zigbee transceiver, LCD and AT889S52 microcontroller for constructing intelligent trolley. Paper [8] reflects the rapid development at the center. Paper [9] provides an intelligent shopping cart with customer facial recognition. On paper[10], the model offers an ISAS notion, with constant acceptance and navigation of the cart. Paper [11] Proposes the development of cheap, smart purchasing aids, which will help customers locate and pick products and educate customers in the shopping complex about unique offers on the products. Paper [12][13]Suggested development of a scheme which could use RFID Reader antennas to monitor vibrant and stationery products in the retail area.

PROPOSED SYSTEM

The suggested framework in this paper offers a RFID and Wi-Fi automated charging system on a cloud platform. Using electromagnetic radiators, the anti-theft system is implemented. To provide the essential information and create an Electronic Report frontend and backend stock system are employed. Each cart will be fitted with an RFID, Infrared Sensor, and ARM7 control unit. The consumer must inspect the RFID tag when an item is chosen before it is placed in the cart. The account will be updated every time the chosen product is added or obliterated. Each item in the cart is detected and counted by the electromagnetic radiation detector. If the entire amount of detected goods does not match the amount of charged items, theft is reported by an alert. The operating system connection is depicted in Figure 1.

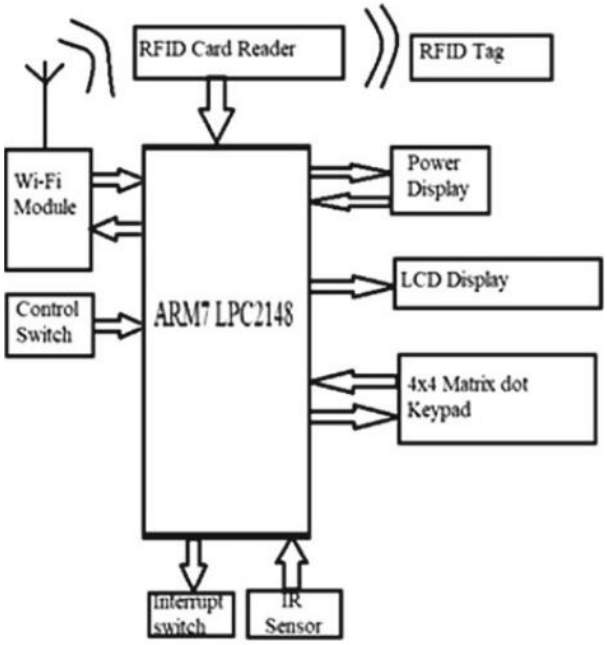

Figure 1 Operating system connection

RESULTS

The hardware is screened using numerous RFID tags. Once the trolley is boosted and the shopping starts, the "SHOPPING STARTED" quote displays on the LCD system depicted in

Figure 6. Before purchasing process starts, the Wi-Fi module is initialized and the products can be inserted or withdrawn by utilizing the “toggle switch” positioned on the trolley.

Table 1 Contrast between the current scheme and the scheme suggested

Number of items purchased	Existing traditional technology (shopping + billing time)	Proposed technology (approx.) (shopping + billing time)	Percentage reduction (approx.)
10	(20 + 10) min	(20 + 2) min	27
20	(35 + 10) min	(35 + 2) min	24

Table1 provides an estimated contrast between the real moment of shopping between the standard technique and the scheme suggested. The payment period is significantly reduced. The median purchasing period decreases up to 26 percent.

CONCLUSION

In this research, the advantage of clients in terms of a significant reduction in moment wasted on an auto-check-out desk is recognized. The cloud scheme allows the customer and supervisor to view the account via various URLs. The proposed inventory scheme decreases the daily inventory load. In addition, the shopping period is reduced by 26% in comparison with standard purchasing techniques. Any retailer's shopping cart is easily linked to intelligent trolley equipment. The price can, however, be considerably decreased if the Smart Trolley is created and marketed accordingly. Extra factors such as discounts and item recommendations can be embedded in the automated trolley for enhancement. The shopping period can also be considerably decreased by using an integrated tracking technique.

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