

Smart Trolley in Shopping Mall

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Abstract -- Now a days shopping at big malls is becoming a daily activity in metro cities and non-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. Our aim is to develop a system that can be used in shopping malls to solve the above mentioned challenges. On other hand, Management department faces problem regarding manual analysis of previous records and it is also tough job to predict future requirements. This system will help to reduce workload and manual errors which arise in traditional analysis process by providing automatic analysis, statistics and predicting future stock requirements.

Keywords- billing, inventory, prediction, regression, stock.

I. INTRODUCTION

Now a day's numbers of large as well as small shopping malls has increased throughout the global due to increasing public demand & spending. Sometimes customers have problems regarding the incomplete information about the product on sale and waste of unnecessary time at the billing counters. Continuous improvement is required in the traditional billing system to improve the quality of shopping experience to the customers. It is also seen that as customers approach is increasing towards shopping malls it is becoming tough job for management department to analyze the sales of product and in festival seasons sometime it becomes hard to predict how much stock of products will be required to avoid unavailability of products. To overcome these problems stated above and to improve the existing system this shopping shopping cart will generate the shopping bill on cart itself with the help of RFID reader and

inventory management to analyze the previous sale and predict future stock requirement accordingly. This system will also provide graphical statistics for better understanding of overall sales. This can be done by training the model using proper dataset which includes data related previous sell record. This system will save time of customers and workload of employees in mall. Stocks are considered to be very dynamic and susceptible to quick changes because of the underlying nature of the financial domain and in part because of the mix of known parameters (Previous season's stock, sold items record). An intelligent trader would predict the stock requirement and buy a stock before the present stock over. Though it is very hard to replace the expertise that an experienced trader has gained, an accurate prediction algorithm can directly result into high profits for investment firms, indicating a direct relationship between the accuracy of the prediction algorithm and the profit made from using the algorithm

In practice, there are 2 Stock Prediction Methodologies:

- i. **Fundamental Analysis:** Performed by the Fundamental Analysts, this method is concerned more with the company rather than the actual stock. The analysts make their decisions based on the past performance of the company, the earnings forecast etc.
- ii. **Technical Analysis:** Performed by the Technical Analysts, this method deals with the determination of the stock based on the past patterns of the stock (using time-series analysis.) When applying Machine Learning to Stock Data, we are more interested in doing a Technical Analysis to see if our algorithm can accurately learn the underlying patterns in the stock time series.

II. LITERATURE SURVEY

Smart Trolley In Shopping Mall is a User-adaptive Context-aware Interface for Shopping Assistance, has discussed an instrumented shopping cart that acts as a user interface to support the shopping process. RFID technology enables recognizing products that are put in the cart's basket. They were also able to determine the cart's position in an instrumented shopping environment. User input and visual output are possible by means of a touch screen mobile phones, RFID reader is fitted in the Cart to support different tasks involved in the shopping process and mobile always with customers. Objects put inside the basket are recognized, transmitted to the environment, and visualized at the cell phones screens. In order to personalize the system, users can identify themselves by entering own id into the mobile phone with cart number. Finally, the customer can click on the mobile display to interact with the system or press a single button for getting an overview of services offered by the system using the iPhone metaphor [2]. iGrocer-A Ubiquitous and Pervasive Smart Grocery shopping system, has discussed that, emerging smart phones are poised to give a whole new dimension to the way we shop, bank, and go about many of our everyday activities. It is capable of maintaining nutrition profiles of users. Particularly useful for elders and disabled shopper Smart Shopping cart for automated billing purpose using RFID has discussed that, the RFID reader on cart scan id of product. On backend that product will be processed with database which is an simple price comparing method. From that system get cost of product and add that product into the bills. Then that bill will send to respective customer when customer demanding for bill.

III. ARCHITECTURE OF SMART TROLLEY IN SHOPPING MALL

The system architecture of this system shows the conceptual model that defines the structure, behavior, and more views of a system. Following figure shows the architecture of Smart trolley in shopping mall. This is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system. Architecture of the system is consisting of RFID reader which is embedded on cart, central server and analysis and prediction system. Central server is a backbone of entire system which is responsible for locating and communicating with cart, fetching the product details from database when it is get added in cart and maintaining and updating all the details

in database which is then given as an input for stock prediction module.

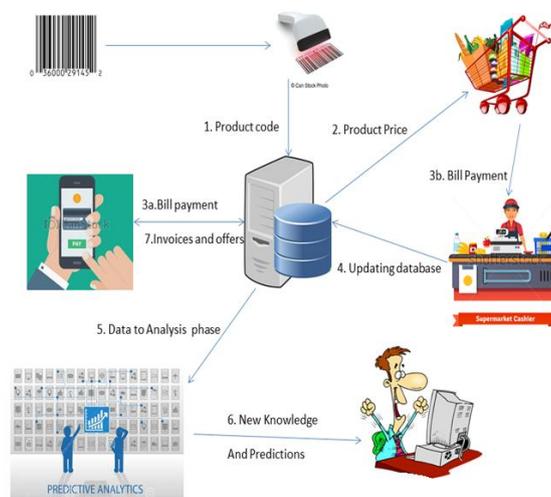


Fig. 1 Architecture of Smart Trolley in Shopping mall

IV. METHODOLOGY

A. Arduino Uno – for bill generation

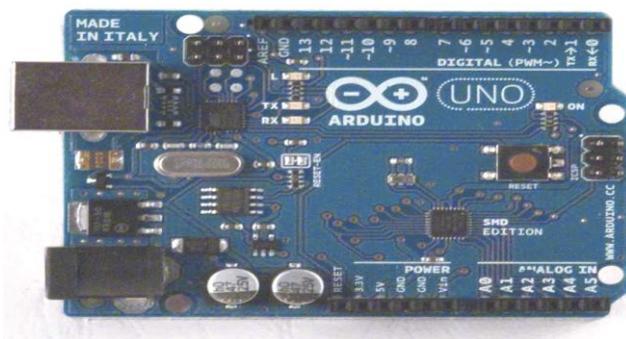


Fig. Arduino uno r3

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. Revision 2 of the Uno board has a resistor pulling the 8U2

HWB line to ground, making it easier to put into DFU mode. Revision 3 of the board has the following new features:

Pin out point added SDA and SCL pins that are near to the AREF pin and two other new pins placed near to the RESET pin, the IOREF that allow the shields to adapt to the voltage provided from the board. In future, shields will be compatible both with the board that use the AVR, which operate with 5V and with the Arduino Due that operate with 3.3V. Stronger RESET circuit. Atmega 16U2 replace the 8U2.

B. RFID RC522 READER

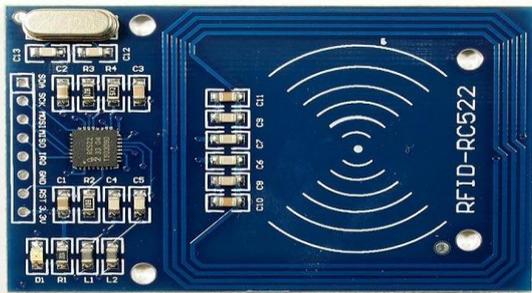


Fig. RFID RC522

RFID reader will help to scan product id and send it to the arduino uno, arduino continuously communicating with the server. Arduino getting information about the product from the server and compare it with scanned products and generate bills and stored it into the server.

V. FUTURE SCOPE

This system can be enhanced by android application which can be used for online payment by using NFC sensors and online payment gateway, it will help user to make payment by just tapping their cell phone on cart all the bill details will be fetched into android app install on cell phone and then user can make payment on tip of their hand.

VI. CONCLUSION

This system will help to minimize the rush on billing counter and it will save valuable time of customer. The decision making process is done locally within the cart, thereby eliminating an overhead to the communication between the notes. Also, the application does not make use of complex routing mechanisms or unicast transmissions; broadcast technique to communicate with the Base Station as each cart is associated with a unique ID. The system is cost-effective as it requires only one chargeable battery and

a camera-based barcode scanner (which is way cheaper than any other type of barcode scanners) per cart. In the bigger picture, it reduces the man-power requirements. Our implementation makes use of the simple Inventory management will help to maintain records and analyze future product stock requirements. It will predict future sales for next month and sales for particular product. There is a lot of scope for further work in this area. If various market & economic factors which affect the stock of products are also taken into consideration other than the technical indicators as input variables, better results may be obtained. Also, incorporating market specific domain knowledge into the system might help in achieving better performance.

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