



# PERFORMANCE ANALYSIS OF SMART CHARGING AND BILLING TROLLEY USING RFID SENSOR

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**Abstract:** The modern technology has increased the standard of living for the humans. This resulted in large crowds at shopping malls. To handle the large crowd, we must reduce the process of the billing time. This is done using smart shopping system based on RFID. Items that are put in a smart shopping cart are read one by one and the bill is generated and displayed. After the final bill is generated the customer pays the bill by using their Pre charged cards provided by the shopping mall. The aim is to reduce the time consumption needed for the billing system. And our project includes throttle control based motor drives. And the whole unit is runed by battery, and it is charged by wireless static charging systems. Electronic throttle controls establish the essential connection between the acceleration pedal and the throttle valve using electronic signals instead of a mechanical link. A typical electronic throttle consists of a throttle body with an electric motor, a pair of throttle position sensors and a control unit. Generally, the electronic throttle employs a closed-loop control algorithm. The desired throttle position is calculated based on the information from both the acceleration pedal and other systems. However, an alternative method for charging the battery of an electric trolley is through Wireless Power Transfer where it can be as a static charging systems. Static charging System can be implemented to charge the batteries of the electric trolley when the trolley is parked in static mode. This method of wireless charging of electric trolley is done through inductive power transfer where wireless transmission of power is achieved by mutual induction of magnetic field between transmitter and receiver coil. The type of charging system we have implemented is static charging system. Our aim in “Performance Analysis of Smart Charging and Billing Trolley Using RFID Sensor” project is to help for old-age persons, carried women’s, physically challenged people’s. And to saves the consumption in billing counter.

**Keywords:** Smart charging, Billing Trolley, RFID Sensor, 24V DC Motor



## INTRODUCTION

The modern technology has increased the standard of living for the humans. This resulted in large crowds at shopping malls. To handle the large crowd, we must reduce the process of the billing time. This is done using smart shopping system based on RFID. Items that are put in a smart shopping cart are read one by one and the bill is generated and displayed. After the final bill is generated, the customer pays the bill by using their Pre charged cards provided by the shopping mall. The aim is to reduce the time consumption needed for the billing system. And our project includes throttle control-based motor drives. And the whole unit is run by battery, and it is charged by wireless static charging systems.

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Our aim in “Performance Analysis of Robotic Operation Smart Billing Estimation and Charging Trolley Using RFID Sensor” project is to help for lodge persons, carried women’s, physically challenged people’s. And to saves the consumption in billing counter.

## LITERATURE SURVEY

As per our knowledge only few papers were found in the literature for the automated shopping trolley for supermarket using RFID. The automated shopping trolley for supermarket billing system implemented by Sainath (2014), exploited barcode for billing of products, where customer scans the product using barcode technology. The bill will be forwarded to the central billing system where customer will pay them by showing unique id. The limitation of barcode scanning requires line of sight for scanning and it should be fixed within its boundary. Cash register lines optimization system using RFID technology by Budic (2014), developed a system for shopping using RFID. The RFID is employed for scanning products and the information is stored in the database which could be paid online or in a central bill. It also uses web application to maintain entire shopping details. It requires maintenance of web application server. No necessary steps have been taken for the products that are accidentally dropped into the trolley by the customer. The payment details will be sent to the server by which central billing unit will deal with customer’s payment.

## OUTCOME OF LITERATURE SURVEY

The main aim of the project is to satisfy the customer and to reduce the time spent on the billing process which is to complete the billing process in the trolley rather than waiting in a queue even for one or two products. The customers must add the products after a short scan in trolley and when the shopping is done the finalized amount will be displayed in the trolley.

Customer could either pay their bill by their online payment. And it’s helpful to carried women’s, and oldage persons, and physically challenged persons.

## PROBLEM STATEMENT



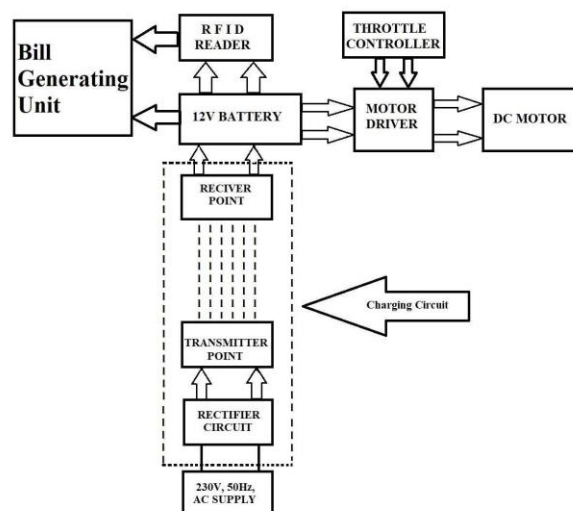
- Time wasting in billing counter.
- Carried women's, old-age persons & physically challenged persons can't push the loaded trolley & they can't stand for a long time.
- User need Adopter and charging unit.
- As plug-in charger is semi-automated there will be interaction with human's which tend to get an electric shock.

## OBJECTIVES

The main objective of this project is,

- To reduce the time consumption in billing counter.
- To help Carried women's, old-age persons & physically challenged person's.
- To increases the shopping in supermarkets.
- In the present-day shopping system one of the difficulties is to follow queue through the billing process which is time consuming.
- Hence this project aims to reduce the average time spent by the customer at the shopping mall by implementing automatic billing system using RFID technology.

## METHODOLOGY



## DISCRIPTION

An RFID tag (of frequency 125khz) is attached to every product in the mall and the reader (EM-18) is attached to the trolley. At the time of purchase, the tag attached to the product is scanned by the reader. Each tag has a unique EPC. Based on the EPC received by the Arduino, the information of the product is displayed on the

LCD along with the updated cost. This information is also sent to central PC with the help of HC-12 transmitter at the trolley and HC12 receiver at the PC. ,If the customer wants to remove the added product, the product should be scanned again. Then the cost of the corresponding product will be deducted from the bill. The push button is provided at the trolley to indicate the end of the shopping. On pressing of push button, the final bill is displayed on the LCD and the payment through your online banking App's using respective payment scanners.

Also our project includes wireless charging system and throttle control for movement of the trolley. The wireless charging system consist of transmitter and receiver coil, receiver coil placed under the trolley and transmitter coil is placed in charging area.

Its just to park the trolley in charging area, the trolley is automatically charged. And the throttle system is used to help old age persons, carried women, to push the loaded trolleys easily.(this whole unit is used to run by using 12V,15mAh rechargeable battery which is placed in the trolley itself).

### ADVANTAGES

- Eco friendly
- Easy to operate
- Low maintains
- Product cost is less
- Helpful for old-age persons, carried women, physically challenged persons

### APPLICATIONS

- Super markets
- Shopping malls
- Grocery marts

### CONCLUSION

The work done with the help of RFID technology, EM-18 reader and Arduino. Its aim is to reduce the time of billing in the long queues so that the customers gets benefited and the same-time inventory management becomes so easy. It can be implemented in shopping mall where there is large crowd and huge risk into malls. In the world of automation, this automatic billing system plays a major role in the upliftment of technology. The technology will replace the present barcode system which is present being followed. Hence this technology can help people to make their life's is a time saving too.

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