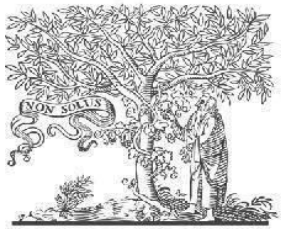
International Journal for Innovative Engineering and Management Research
PEER REVIEWED OPEN ACCESS INTERNATIONAL JOURNAL
www.ijiemr.org

COPY RIGHT



ELSEVIER SSRN

IJIEMR Transactions, online available on 10th Jan 2025. Link

https://ijiemr.org/downloads.php?vol=Volume-14&issue= Issue01

DOI:10.48047/IJIEMR/V14/ISSUE01/06

Title: " SMART BLIND SHOPPING CARRIER CART "

Volume 14, ISSUE 01, Pages: 37 - 51

Paper Authors
M. MOUNIKA, D. MAYUR LAL, P. AKSHAYA, M. PUNDLIK, P. POOJA

USE THIS BARCODE TO ACCESS YOUR ONLINE PAPER

To Secure Your Paper as Per UGC Guidelines We Are Providing A ElectronicBar code

International Journal for Innovative Engineering and Management Research
PEER REVIEWED OPEN ACCESS INTERNATIONAL JOURNAL
www.ijiemr.org

SMART BLIND SHOPPING CARRIER CART

M. MOUNIKA, D. MAYUR LAL, P. AKSHAYA, M. PUNDLIK, P. POOJA

[1]Assistant Professor, Department of ECE, MNR College of ENGG. & Technology, MNR Nagar, Fasalwadiguda, Sanga Reddy-502294

[2,3,4,5]UG Student, Department of ECE, MNR College of ENGG. & Technology, MNR Nagar, Fasalwadiguda, Sanga Reddy-502294

ABSTRACT:

Asmart shopping trolleycan helpthevisuallyimpaired and blind customers to shop without the need of assistance. Shopping malls that provide suchtrolleysattractmore customers. The smart shopping trolley proposedin thisresearch emphasize on Artificial intelligence and is embeddedwith RFID technology. Tesseract optical character recognitionalgorithm extracts the name and cost of the product. The E-speak library reads the name and cost of the product to thevisually impaired as an audio message. The smart trolleymakes use of cameras, Ultrasonic (US) sensors, DC motor,Motor Drivers, interfaced with a Raspberry Pi to make thesystem work. An US sensor finds the distance of an obstacle, if any, in the person's path and alerts the user frequently throughan audio. This shopping trolley assists blind people making iteasier for them to shop and indeed enjoy shopping. The systemsaves customer time thereby promoting business sales.

INTRODUCTION:

With the increasing reliability and cost effectiveness of—Internet of Things (IoT) based connected smart things in the field of consumer applications, it makes better sense to ensure such technologies are put to use in addressing the day-to-day concerns of the common man. In this framework, we portray the execution of a dependable, reasonable and cost effective Smart Shopping Cart. Such a framework is reasonable for use in any Brick and Mortar shopping spots, for example, general stores, where it can help in diminishing work and in making a superior shopping background for its clients. Rather than influencing the clients to sit tight in a long line for looking at their shopped things, the framework helps in mechanizing the charging procedure. Alongside this capacity, the framework configuration additionally guarantees identification of instances of duplicity conjured by deceptive clients, which influences the savvy framework to reasonable and alluring to both the purchasers and merchants. The framework outline alongside the execution is exhibited here. The outcomes are empowering and make shopping less demanding and helpful to the clients. The fundamental target of the proposed framework is to give an innovation arranged, keen, ease, adaptable and rough framework for a superior in-shop involvement for the cutting edge world client. Walmart could at long last end the disappointment of not having the capacity to locate the last sustenance thing on your shopping list - and ending up totally dumbfounded the second you set foot in one of their stores. It is working with a mechanical autonomy firm to create

"driverless" shopping baskets that enables clients to examine in their shopping list - and after those aides them to the correct path and rack.

This new advancement is a route for Wal-Mart to contend with the comfort that Amazon and other online stores offer buyers Wal-Mart says utilizing the automatons empowers it to check stock in about a day or less, rather than a month that it takes physically. At the present time, representatives remain on lifts that go here and there the stacks, and output things to ensure that containers are in the perfect place. As indicated by Walmart's patent demand, clients will have the capacity to summon one of these truck pullers each furnished with cameras and sensors with their user interface gadget, maybe a Smartphone application and a mechanized unit will append to a truck stopped in a docking station and force it to the client. When client and truck meet, the vehicle unit will fill in as individuals Some of these issues would be understood if Walmart chooses to proceed with the Dash. It could incorporate with a Walmart shopping-list application on your telephone, for instance, so you could be taken appropriate to the things you have included since your last visit. Now, however, you begin to ask why you don't simply arrange those basic needs on the web and be finished with it. Which is amusing, as endeavors prefer the Dash shopping cart seem to be, says Bloomberg, intended to enable Walmart to finish with online retailers like Amazon The brilliant shopping cart will be an across the board shopping cart. It will enable the client to monitor the aggregate cost also, when things are added to the shopping cart. The client will be aware of his budget and the offers that are available at the market. It will likewise discuss remotely with an in store segment to make simple installments in a hurry. The client has choice to make easy online payments through the application. Because of any vagueness, the customer will likewise have the alternative of going up to the checkout counters. This new framework would diminish the long hold up times at the checkout counters, increment the productivity of the checkout technique, and would furnish the customer with a la mode cost and aggregate data, which makes the entire experience more helpful. This way it minimizes the labor required at billing counters hence, reducing the amount spent on the labor. The application can promote live offers, and can be updated as the season changes.

This framework addresses one of the common issues that clients face in the existing system such as unable to find the items in the inventory or employee for any help. The application will help the clients to find items at the right inventory by providing the information about the items in the list along with a route map of the super market thereby providing new experience to the clients. This will also have the history of the items bought by the client. This will enable client to use the data for next purchase. The supermarket can understand the trend and hence stock the inventory or promote offers accordingly. This paper aims to outline a framework which peruses the standardized tag on everything that is put in the shopping cart and updates the item data which is accessible to the customer. Weight/Weight sensors will be utilized to distinguish the nearness of new things in the shopping cart. The standardized identification scanner separates the

standardized tag which is transmitted to the microcontroller through an USB association. The microcontroller peruses data from a SD card embedded into the microcontroller. This SD card has all the data about the item. This information is at that point organized and exhibited to the client for survey and affirmation on a LCD screen. New things in the shopping cart will be recognized by following the adjustment in the yield of weight sensors. Similar sensors will be utilized to recognize when things are expelled from the shopping cart. A program will be executed to affirm the expulsion from the customer's shopping basket. Another program will be executed to function as an against burglary system to keep the customer from leaving without an effective installment. The carts inbuilt programmed charging framework makes shopping a breeze and has other positive turn offs, for example, liberating staff from tedious checkout filtering, lessening an aggregate number of staffs required and expanding operational effectiveness of the framework. In conclusions, we likewise talk about open doors for enhancing the proposed framework to influence it into a monetarily suitable item as a phenomenal approach to help clients to lessen the time spent in shopping by showing the rundown of items, their cost, the best arrangements/rates on the items and programmed charging. The framework assists the store administration with a programmed refresh of the stock on each buy of a thing Intelligent shopping basket (proposed framework) can possibly make shopping more pleasurable and effective for the customer and the stock control less demanding for the store administration. Clever shopping basket (proposed framework) can possibly make shopping more pleasurable and effective for the customer and the stock control less demanding for the store administration.

LITERATURE SURVEY

Gubbi, J., Buyya, R., Marusic, S., Palaniswami, S.: Internet of Things (IoT): a vision, architectural elements, and future directions. IEEE (2011). https://doi.org/10.1109/i-smac.2017.8058399

Ubiquitous sensing enabled by Wireless Sensor Network (WSN) technologies cuts across many areas of modern day living. This offers the ability to measure, infer and understand environmental indicators, from delicate ecologies and natural resources to urban environments. The proliferation of these devices in a communicating–actuating network creates the Internet of Things (IoT), wherein sensors and actuators blend seamlessly with the environment around us, and the information is shared across platforms in order to develop a common operating picture (COP). Fueled by the recent adaptation of a variety of enabling wireless technologies such as RFID tags and embedded sensor and actuator nodes, the IoT has stepped out of its infancy and is the next revolutionary technology in transforming the Internet into a fully integrated Future Internet. As we move from www (static pages web) to web2 (social networking web) to web3 (ubiquitous computing web), the need for data-on-demand using sophisticated intuitive queries increases significantly. This paper presents a Cloud centric vision for worldwide implementation of Internet of Things. The key enabling technologies and application domains that are likely to

drive IoT research in the near future are discussed. A Cloud implementation using Aneka, which is based on interaction of private and public Clouds is presented. We conclude our IoT vision by expanding on the need for convergence of WSN, the Internet and distributed computing directed at technological research community. The next wave in the era of computing will be outside the realm of the traditional desktop. In the Internet of Things (IoT) paradigm, many of the objects that surround us will be on the network in one form or another. Radio Frequency IDentification (RFID) and sensor network technologies will rise to meet this new challenge, in which information and communication systems are invisibly embedded in the environment around us. This results in the generation of enormous amounts of data which have to be stored, processed and presented in a seamless, efficient, and easily interpretable form. This model will consist of services that are commodities and delivered in a manner similar to traditional commodities. Cloud computing can provide the virtual infrastructure for such utility computing which integrates monitoring devices, storage devices, analytics tools, visualization platforms and client delivery. The cost based model that Cloud computing offers will enable end-to-end service provisioning for businesses and users to access applications on demand from anywhere. Smart connectivity with existing networks and context-aware computation using network resources is an indispensable part of IoT. With the growing presence of WiFi and 4G-LTE wireless Internet access, the evolution towards ubiquitous information and communication networks is already evident. However, for the Internet of Things vision to successfully emerge, the computing paradigm will need to go beyond traditional mobile computing scenarios that use smart phones and portables, and evolve into connecting everyday existing objects and embedding intelligence into our environment. For technology to disappear from the consciousness of the user, the Internet of Things demands: (1) a shared understanding of the situation of its users and their appliances, (2) software architectures and pervasive communication networks to process and convey the contextual information to where it is relevant, and (3) the analytics tools in the Internet of Things that aim for autonomous and smart behavior. With these three fundamental grounds in place, smart connectivity and context-aware computation can be accomplished. The term Internet of Things was first coined by Kevin Ashton in 1999 in the context of supply chain management [1]. However, in the past decade, the definition has been more inclusive covering wide range of applications like healthcare, utilities, transport, etc. [2]. Although the definition of ‘Things’ has changed as technology evolved, the main goal of making a computer sense information without the aid of human intervention remains the same. A radical evolution of the current Internet into a Network of interconnected objects that not only harvests information from the environment (sensing) and interacts with the physical world (actuation/command/control), but also uses existing Internet standards to provide services for information transfer, analytics, applications, and communications. Fueled by the prevalence of devices enabled by

open wireless technology such as Bluetooth, radio frequency identification (RFID), Wi-Fi, and telephonic data services as well as embedded sensor and actuator nodes, IoT has stepped out of its infancy and is on the verge of transforming the current static Internet into a fully integrated Future Internet [3]. The Internet revolution led to the interconnection between people at an unprecedented scale and pace. The next revolution will be the interconnection between objects to create a smart environment. Only in 2011 did the number of interconnected devices on the planet overtake the actual number of people. Currently there are 9 billion interconnected devices and it is expected to reach 24 billion devices by 2020. According to the GSMA, this amounts to $1.3 trillion revenue opportunities for mobile network operators alone spanning vertical segments such as health, automotive, utilities and consumer electronics. A schematic of the interconnection of objects is depicted in Fig. 1, where the application domains are chosen based on the scale of the impact of the data generated. The users span from individual to national level organizations addressing wide ranging issues. This paper presents the current trends in IoT research propelled by applications and the need for convergence in several interdisciplinary technologies. Specifically, in Section 2, we present the overall IoT vision and the technologies that will achieve it followed by some common definitions in the area along with some trends and taxonomy of IoT in Section 3. We discuss several application domains in IoT with a new approach in defining them in Section 4 and Section 5 provides our Cloud centric IoT vision. A case study of data analytics on the Aneka/Azure cloud platform is given in Section 6 and we conclude with discussions on open challenges and future trends in Section 7.

Gangwal, U., Roy, S., Bapat, J.: Smart shopping cart for automated billing purpose using wireless sensor networks. IEEE (2013). https://doi.org/10.1109/icices.2014.703399

With the increasing employment of broad area Wireless Sensor Networks (WSN) in the field of consumer applications, it becomes imperative to address the concerns raised by its application, such as reliability, energy consumption and cost-effectiveness. In this paper, we describe the implementation of a reliable, fair and cost efficient Smart Shopping Cart using Wireless Sensor Networks. Such a system is suitable for use in places such as supermarkets, where it can help in reducing man power and in creating a better shopping experience for its customers. Instead of making the customers wait in a long queue for checking-out their shopped items, the system helps in automating the billing process. Along with this ability, the system design also ensures detection of cases of deception invoked by dishonest customers, which makes the smart system fair and attractive to both the buyers and sellers. The system design along with the experimental setup are presented. The results are encouraging and with the use of repeaters at appropriate locations inside the supermarkets, our approach illustrates itself to be conceivable for use outside the laboratory, in real world deployment. Enormous amount of advancements in the field of Wireless Communication has

given way to several new technologies and fields altogether. One such upcoming field is Wireless Sensor Networks (WSN), which is maturing at a very fast pace because of its suitability in a wide range of application areas. It consists of a large number of small, low-power, cost-effective, autonomous devices termed as sensor motes. When interfaced with sensors and actuators, which could be simple or complex, they play the combined role of environmentsensing, special-computing and wirelessly communicating devices. These factors accompanied by the effectiveness of technologies for miniaturization of hardware (microcontrollers and radio modems, for example), technologies for sensing equipments, technologies for energy saving and scavenging, and the fact that many applications cannot be wired, makes it suitable for various application domains. Examples of such applications are medicine and health care, disaster relief applications, environment and industrial monitoring, etc. [1] In this new era of consumerism, broad area WSN finds its use in consumer application areas such as Smart Home, Smart Grid, etc. The challenges here are to not only make the system intelligent by automation, but also to handle the concerns that are raised due to the automation process such as probability of false alarms, energy consumption, cost-effectiveness, etc. Since many sensor nodes are required over a broad area for environment-sensing, the system design needs to concentrate on aspects such as the choice and placement of sensors within the area, communication among the various nodes so that it works reliably with minimum energy requirement and be costeffective at the same time. In this work, we take the particular case of supermarkets, where our design based on WSN is used to address the following issues: 1) Customer dis-satisfaction because of long waiting time for check-out process, and 2) Involvement of a lot of man-power, which is expensive. In order to achieve this, we have come up with a design that automates the billing procedure and saves the customers' time. Automation has its own problems. Absence of human operators can potentially lead to inconvenience when the underlying technology fails. It can also lead to dishonest behavior of the customers. We propose and implement a solution that has redundancy built into it in order to reduce the probability of failure, and has three main benefits: 1) It creates a better shopping experience for the customers by saving their time. 2) It minimizes the man-power required at the shopping mall, as the checking-out process at the check-out counters is eliminated altogether. 3) It handles cases of deception if any, thereby making the system attractive not only to the customers, but also to the sellers. A number of attempts have been made to design a Smart Shopping Cart with various different functionalities. Awati and Awati [2], describe a Smart Trolley design that concentrates on how to get the customers rid of dragging heavy trolleys and to automate billing, but it assumes all the customers to be honest and hence does not tackle cases of deception, if there are any. Further, Yew et al. [3] propose a smart shopping for future where the barcodes are completely replaced by Radio Frequency Identification (RFID) tags and scanners. This idea might take a long time to be deployed as it is expensive both in terms of money and energy. A lot of other works

describe how products in a store could be tracked by customers instead of spending a lot of time searching for it. In this paper, the system design considerably minimizes the overhead of wireless communication among the devices involved in the system as almost every processing is done locally at each cart instead of transmitting packets to another node. Hence even when there are a lot of customers present in the shopping mall, there will not be any deterioration in the performance owing to communication gridlock. Every Shopping Cart is equipped with a sensor mote, a load-cell fitted at the base of the trolley, a camera fitted on the top (also acts as barcode scanner) and a system for local processing and display purposes as shown in Figure 1. Every customer is identified by the ID of the cart s/he picks for shopping. The Base Station at the payment counter consists of a database that stores information of all the products, and a sensor mote to communicate with all the Smart Carts in the mall. When a customer starts shopping, s/he has to scan the barcode of the product with the barcode scanner present at the cart, after which the product has to be put into the basket. The barcode of the product is wirelessly transmitted by the mote to the Base Station using the IEEE 802.15.4 (ZigBee Protocol) [4] over the ZigBee network. ZigBee is chosen along with the IEEE 802.15.4 compatible sensor motes because they are easily available and mass produced. However, any other short distance radio system will work equally well. In reply, the Base Station sends relevant information about the product, which is used in the decision-making process at the cart. In order to handle all the cases of mistake/dishonesty, the design includes the use of image processing at the cart. After the customer finishes shopping, s/he then proceeds to the payment counter to pay the bill amount and is assisted by an attendant only in the case the system detects discrepancy in the self check-out process of the customer. The organization of this paper is as follows: Section II presents the detailed system design, Section III gives the implementation details, Section IV discusses the result and feasibility issues, and Section V concludes the paper.

Yathisha, L., Abhishek, A., Harshith, R., Darshan Koundinya, S.R., Srinidhi, K.: Automation of shopping cart to ease queue in malls by using RFID (2015). https://doi.org/10.1109/icices.2014.7033996

Specially, it becomes more crowded on holidays. People purchase different items in the malls and puts them in the trolley. At the cash counter billing process is done using bar code scanner. This is very time consuming process. To avoid this we are developing a system which we called as ‘AUTOMATION OF SHOPPING CART Using RFID module and ZIGBEE module’. In this system we are using RFID tags instead of barcodes. This RFID tags will be on the product. Whenever the customer puts a product into trolley it will get scanned by RFID reader and product price and cost will be display on LCD display. Like this the process goes on. We are using ZIGBEE transmitter which will be at trolley which is used to transfer data to main computer. At the main computer ZIGBEE receiver will be placed which will receive data from transmitter. The barcode system is no longer the best way to business operation. Customers are tired of waiting in long, slowly moving

checkout line in departmental stores, especially, in holidays. With the decrease of prices through efficiencies of technology and large-scale production of semiconductor wireless components, there has been a search for new markets in which semiconductor chips can be used. This has led to the use of RFID also known as smart tags. RFID stands for Radio Frequency Identification. In a very interesting article, the San Jose Mercury News tells us about Charles Walton, the man behind the radio frequency identification technology (RFID). In this paper we are using RFID technology for making an futuristic billing trolley. A device "BILLING TROLLEY" also called as "Data Logger Device" is an information storage system. Here the system parameters of an Futuristic Trolley like products name, products amount, company name etc. are continuously recorded. The system displays as well as announces the name of the product and cost. This is also applicable for various applications and using proper interface the recorded data can be downloaded on and stored into a computer. The trolley being wireless consist of ZIGBEE module hence free to move in large area. The system is an efficient means for a commercial purpose as it is less time consuming and easy to control. Shopping in the present day usually involves waiting in line to get your items scanned for checkout. This can result in a great deal of wasted time for customers. Furthermore, the technology currently used in checkouts barcodes - is from another era, developed in the 1970s. Today barcodes are found on almost every item. Barcodes are a universal technology in that they are the norm for retail products; stores that own a barcode reader can process barcodes and imprint it on the products. The most important factor that is involved in barcode scanning is that the product should be in the Line of Sight (LOS) of the reader in order to get the barcode imprinted on the product scanned. Nowadays, if a consumer would like to buy something at a shopping mall, consumers need to take the particular items from the display shelf and then queue up and wait for their turn to make payment. Problem will surely arise when the size of a shopping mall is relatively huge and sometimes consumers don't even know where certain items are placed. Besides, consumers also need to queue for a long time at the cashier to wait for turn to make payment. The time taken for consumers to wait for the customers in front of the queue to scan every single item and then followed by making payment will definitely take plenty of time. This condition will surely become worst during the season of big sales or if the shopping mall still uses the conventional way to key in the price of every item by hand to the cash register. On the other hand, consumers often have to worry about plenty of things when going to the shopping mall.[1] For example, most consumers will worry the amount of money brought is not enough to pay for all the things that wanted to be bought until it comes to our turn to pay at the cashier, consumers might also worry that whether certain food product available at the shopping mall are suitable for vegetarian since most of the food product might not be stated clearly. It will be a great convenience if the information of items that are available in the shopping mall can be obtained. It will be a great improvement on the existing system if the technology of

RFID is implemented. Consumers will be able to get information of all the items at shopping mall, total up the prices of items as they shop, and save unnecessary time at the cashier.[2]

Kaur, A., Garg, A., Verma, A., Bansal, A., Singh, A.: Arduino based smart cart. Int. J. Adv. Res. Comput. Eng. Technol. (IJARCET) 2(12) (2013)

As the world is technologically advancing, the desire to reduce human efforts is at its peak. Same is the case with the field of shopping. Earlier, shopkeepers used to manually arrange the products chosen by customers and would do the bill calculation manually, too. But with the birth of huge supermarkets and shopping malls, manually arranging and handing of products to customers as well as manual bill calculation seemed impractical and impossible. Thus, Barcode based shopping came into existence. But it too, has its own limitations and there is scope for development. In the era of "smart", we need to up the game for shopp ing as well and switch to smart shopping. This project shall result into a new shopping experience and shall reduce the efforts made and the time spent by an average shopper to a considerable extent. This project might also felicitate the emergence of an automated shopping system. Presently, the shopping system used in the shopping malls is the Barcode System. This system has replaced the previous manual system but has limitations. To begin with, barcode system requires the barcode on the products to be in the line of site of the barcode scanner. Its scanning range is just from a few inches to a few feet. A barcode scanner can read products only one at a time. Barcodes define the type of every product but can't do it uniquely. Barcodes are read only type and can't be overwritten. The barcode system runs on optical (laser) technology. Barcodes also require a considerable amount of man power and human effort. Barcodes can get damaged easily. Not only this, the current Barcode system requires the customer to stand in long queues in order to get their products scanned and their bills generated. This process can prove to be tiresome and it also consumes a lot of time of the customers, thereby adding to their frustration. With so many disadvantages to it, Barcode system is still in use. It is obvious that there is a need to bring on a smarter and a more efficient system Smart cart using Arduino and RFID is a new advancement in the field of Supply Chain Optimization. This system shall not only eradicate the long queues in supermarkets and malls but also save a lot of time for the customers. The system also helps the customer in money management. The system uses RFID tags in the place of Barcode tags which are much more efficient and powerful when it comes to scanning of products. The device developed using Arduino and RFID shall be installed on the shopping cart or shopping basket and the customer shall scan their products themselves and the total generation shall happen on the cart itself. This shall also give an idea to the customers on how much their particular shopping session shall cost them. Hence, time management and money management, both shall be taken care of. The paper is ordered into five segments. The first segment gives a quick introduction about the system. The second segment is about shopping systems and the study of related existing systems. The third

segment details out the implementation of the system. The fourth segment presents the results obtained using the Arduino and RFID containing device. Finally, the conclusion provides the summary and future scope about the system. In the Literature review, we shall be discussing about the different characteristics of the project by taking reference of the existing projects that are resemble the working of the current project. Iswarya.C, Josuva.D, Vasanthakumar.R [1] have stated that even though substantial research has been carried out on applications related to Supply Chain Optimization, yet there is insufficiency of understanding of essentials and the advantage of further organizing and managing the data within business intelligence infrastructures that allow distributing, integrating and inspecting RFID data. Although the system has been proposed by them and explained well but they have not implemented the system and therefore, the results coming out of their proposed system is unknown and cannot be compared. The usage of RFID tags and reader makes the system pretty efficient when it comes to the scanning of products. According to Ashmeet Kaur, Avni Garg, Abhishek Verma, Akshay Bansal, Arvinder Singh [2], if you are to scan 10,000 items, the time taken by a barcode system shall be 53 hours but the time taken for the same number of items by a RFID system is just 2 hours. This goes to explain how productive RFID systems are as compared to the existing barcode system. If you have a look at the research work and proposal paper of Tanushree, Siddharth Yadav, Saksham Aggarwal, Sagar , Mohit Yadav , Neeraj Gupta , Shruti Karkra[3], you shall find that the usage of a RFID based system shall not only reduce the hassle that we get to see in supermarkets but it shall also eliminate the wastage of paper making the system economical as well as environment friendly. Areeb Asif, Bhavana Singh, Ayush Kr. Sonkar, Hardik Dua, Preeti Dhiman[4] say that one of the many problems faced by supply chains is the maintenance of dealing records and the lack of live inventory lead to problems such as products being unavailable for sale, and gradual but painful loss of customers. According to Muhib A. Lambay, Abhishek Shinde, Anupam Tiwari, Vicky Sharma[5], the RFID system enables the retailers to get several additional details about the product as compared to the Barcode system. Therefore, when it comes to efficiency and accuracy, RFID systems prove to be a better option compared to the existing Barcode System.

Dash Robotic Shopping Cart. **https://www.fastcompany.com/3061405/walmart-is-testing-arobot-shopping-cart-so-you-can-do-the-job-of-low-wage-workers**

A shopping centre or departmental store or supermarket is a place where consumers like us purchase many products for our day to day usage. So usually all of us have to wait in long queues to get our products scanned using barcode scanner and get it billed. To overcome this problem, we have proposed a new ‘Intelligent shopping cart and economic analysis (based on IOT) using cloud server'. This overall design is used to assist people when they are shopping and it avoids standing in long queues and thus it saves time. Our intelligent shopping cart has Microcontroller and Reader/scanner and it

International Journal for Innovative Engineering and Management Research
PEER REVIEWED OPEN ACCESS INTERNATIONAL JOURNAL
www.ijiemr.org

is also useful in economic analysis. The products in the shopping centres will have particular tags to access the product information. When a customer places a product in the cart, the reader will scan and read the ID of the each product and the information related to those products will be stored in micro controller. The total amount of the products we purchased will be calculated and will be updated on the cloud server for further references. Many of us tend to buy products in shopping centres or departmental stores or super markets. One of the major inconvenience faced is we follow queues which consumes lot of time even when we buy one or two products. Also, when it comes to shopping, people generally overshoot their budget and this happens generally in supermarkets. Also, they end up in waiting for the products to be checked, scanned and billed. So in order to maintain the predefined budget, we can use this intelligent shopping cart. The core idea of this project is to automate the traditional billing process so as to eliminate the manpower and the time consumed. The shopkeepers are ready towelcome such smart machines that automate the billing process. So we decided to incorporate this automatic billing concept in our cart rather than waiting in the queue even for one or two products .Customers can pay their bills through the pre recharged cards provided by the shop. This project I makes the traditional way of billing completely automated and it is user friendly and much easy to use.

IMPLEMENTATION

BLOCK DIAGRAM

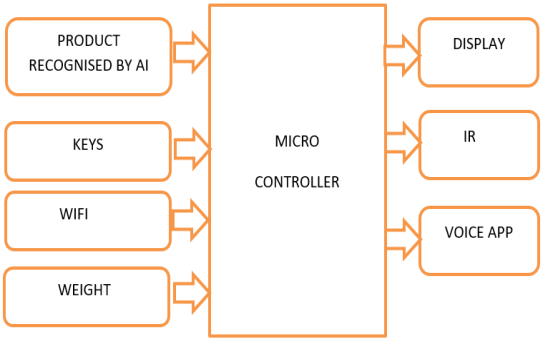


Fig: Block Diagram

DESCRIPTION

POWER SUPPLY

A **regulated power supply** transforms unregulated AC (Alternating Current) into a stable DC (Direct Current). It guarantees consistent output despite variations in input. A regulated DC power supply is also known as a linear power supply, it is an embedded circuit and consists of various blocks

- **Regulated Power Supply Definition**: A regulated power supply ensures a consistent DC output by converting fluctuating AC input.
- **Component Overview**: The primary components of a regulated power supply include a transformer, rectifier, filter, and regulator, each crucial for maintaining steady DC output.
- **Rectification Explained**: The process involves diodes converting AC to DC, typically using full wave rectification to enhance efficiency.
- **Filter Function**: Filters, such as capacitor and LC types, smooth the

DC output to reduce ripple and provide a stable voltage.

- **Regulation Mechanism**: Regulators adjust and stabilize output voltage to protect against input changes or load variations, essential for reliable power supply

SENSORS

Sensors are used for sensing things and devices etc. A device that provides a usable output in response to a specified measurement. The sensor attains a physical parameter and converts it into a signal suitable for processing (e.g. electrical, mechanical, optical) the characteristics of any device or material to detect the presence of a particular physical quantity. The output of the sensor is a signal which is converted to a human-readable form like changes in characteristics, changes in resistance, capacitance, impedance, etc.

IR SENSOR WORKING AND APPLICATIONS

In the electromagnetic spectrum, the infrared portion divided into three regions: near infrared region, mid infrared region and far infrared region.

In this blog we are talking about the IR sensor working principle and its applications.

What is an IR Sensor?

IR sensor is an electronic device, that emits the light in order to sense some object of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation. These types of radiations are invisible to our eyes, but infrared sensor can detect these radiations.

Fig: Ir Sensor

What is HC-SR04 Ultrasonic Sensor:

The HC-SR04 ultrasonic sensor includes a transmitter & a receiver. This sensor is used to find out the distance from the objective. Here the amount of time taken to transmit and receive the waves will decide the distance between the sensor and an object. This sensor uses sound waves by using non-contact technology. By using this sensor the distance which is required for the target can be measured without damage and provides accurate details. The range of this sensor available between 2cms to 400cms.

Weight Sensor

Definition: A load cell or weight sensor is one kind of sensor otherwise a transducer. The **working principle of the weight sensor** depends on the conversion of a load into an electronic signal. The signal can be a change in voltage; current otherwise frequency based on the load as well as used circuit.

Theoretically, this sensor detects changes within a physical stimulus like force, pressure or weight and produces an output that is comparative to the physical

stimulus. So, for a specific stable load otherwise weight size, this sensor provides an output value and that is comparative to the weight's magnitude. The best example of this sensor module is SEN0160.

Module – SEN0160

The SEN0160 weight sensor module is based on HX711 ADC; it is an accurate 24-bit ADC which is designed for industrial control as well as weighs scale applications to connect straight with a bridge sensor. Evaluated with other integrated circuits, this HX711 includes basic functions and also some features like a quick response, high integration, immunity, etc. This chip reduces the cost of electronic scale as well as improves the reliability and performance.

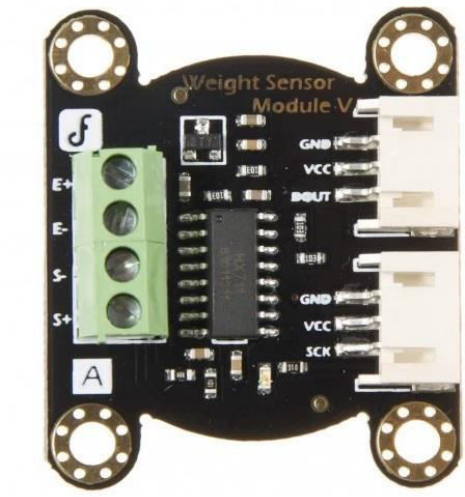


Fig: SEN0160-wireless-sensor-module

RFID READER

Active RFID and Passive RFID technologies, while often considered and evaluated together, are fundamentally distinct technologies with substantially different capabilities. In most cases, neither technology provides a complete solution for supply chain asset management applications. Rather, the most effective and complete supply chain solutions leverage the advantages of each technology and combine their use in complementary ways. This need for both technologies must be considered by RFID standards initiatives to effectively meet the requirements of the user community.

RFID Reader Module, are also called as interrogators. They convert radio waves

Returned from the RFID tag into a form that can be passed on to Controllers, which can

Make use of it. RFID tags and readers have to be tuned to the same frequency in order to

Communicate. RFID systems use many different frequencies, but the most common and

Widely used & supported by our Reader is 125 KHz.

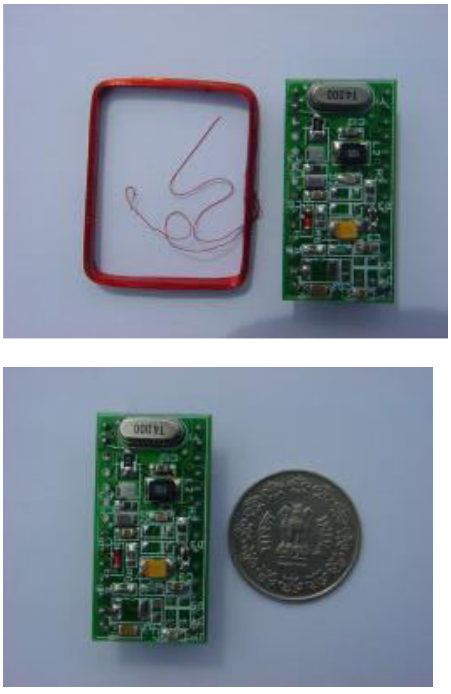


Fig: RFID MODULE

International Journal for Innovative Engineering and Management Research
PEER REVIEWED OPEN ACCESS INTERNATIONAL JOURNAL
www.ijiemr.org

NODEMCU:

NodeMCU is an open source LUA based firmware developed for ESP8266 wifi chip. By exploring functionality with ESP8266 chip, NodeMCU firmware comes with ESP8266 Development board/kit i.e. NodeMCU Development board. Since NodeMCU is open source platform, their hardware design is open for edit/modify/build. NodeMCU Dev Kit/board consist of ESP8266 wifi enabled chip. The ESP8266 is a low-cost Wi-Fi chip developed by Espressif Systems with TCP/IP protocol. For more information about ESP8266, you can refer ESP8266 WiFi Module. There is Version2 (V2) available for NodeMCU Dev Kit i.e. NodeMCU Development Board v1.0 (Version2), which usually comes in black colored PCB.

NodeMCU Development Kit/Board consist of ESP8266 wifi chip. ESP8266 chip has GPIO pins, serial communication protocol, etc. features on it.

ESP8266 is a low-cost Wi-Fi chip developed by Espressif Systems with TCP/IP protocol. For more information about ESP8266, you can refer ESP8266 WiFi Module.

The features of ESP8266 are extracted on NodeMCU Development board. NodeMCU (LUA based firmware) with Development board/kit that consist of ESP8266 (wifi enabled chip) chip combines NodeMCU Development board which make it stand-alone device in IoT applications.

Let's see 1st version of NodeMCU Dev Kit and its pinout as shown in below images.

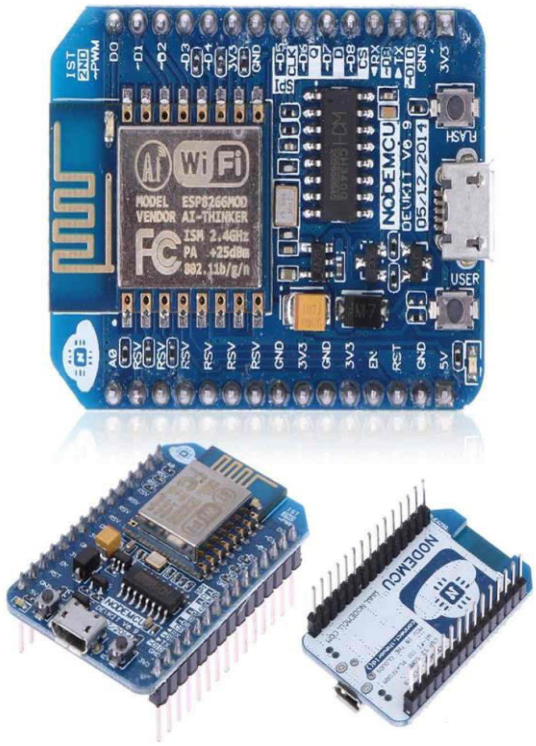


Fig: Node Mcu

CONCLUSION:

The Internet of Things is one such technology that connects various objects in a network and is a milestone in the era of the smart world. The smart shopping cart features these technology enabling users to shop efficiently. Internet of things is the leading technology that makes the world experiences a seventh sense. By the year 2020, around 1 billion objects will be connected thus making the world smart. This smart shopping cart is implemented in such a way that it allows the customer to scan the item that he/she wants to purchase and automatically updates the bill thus preventing long queues at the checkout. Also, another interesting feature of this smart shopping cart is the cart-to-cart communication that helps the customers to shop parallel with friends and family.

REFERENCES:

1. Gubbi, J., Buyya, R., Marusic, S., Palaniswami, S.: Internet of Things (IoT): a vision,architectural elements, and future directions. IEEE (2011). https://doi.org/10.1109/i-smac.2017.8058399

2. Gangwal, U., Roy, S., Bapat, J.: Smart shopping cart for automated billing purpose usingwireless sensor networks. IEEE (2013). https://doi.org/10.1109/icices.2014.703399

3. Yathisha, L., Abhishek, A., Harshith, R., Darshan Koundinya, S.R., Srinidhi, K.: Automationof shopping cart to ease queue in malls by using RFID (2015). https://doi.org/10.1109/icices.2014.7033996

4. Kaur, A., Garg, A., Verma, A., Bansal, A., Singh, A.: Arduino based smart cart. Int. J. Adv.Res. Comput. Eng. Technol. (IJARCET) 2(12) (2013)

5. Dash Robotic Shopping Cart. https://www.fastcompany.com/3061405/walmart-is-testing-arobot-shopping-cart-so-you-can-do-the-job-of-low-wage-workers

6. Sanghi, K., Singh, R., Raman, N.: The Smart Cart – An Enhanced Shopping Experience. TA: Justine Fortier Team 41 (2012)

7. Dubey, V., Sangeeth Sagar, V.R., Sumalya, S., Abhilash, C.B.: An Android approach forwireless power harvesting from radio waves. In: Contemporary Computing and Informatics (IC3I), pp. 1235–1239. IEEE (2014). https://doi.org/10.1109/ic3i.2014.7019670