

Advancement of Shopping Cart to Reduce Push/Pull while Shopping

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Abstract—A shopping cart is a type of transportation or container that can be used by customers to transport their interior design, grocery stores, and grocery stores. A shopping cart is a stroller designed by grocery stores. Our cause of the project is to design an automated shopping cart, to be able to assist buyers, along with a vast ability to avoid obstacles with the help of built-in intelligence. This can be done because the system is controlled by a simple micro-controller (Node-MCU ESP8266), an ultrasonic positioning system, a transmitter, and a receiver-based approach to identifying and locating the victim, and an infrared sensor system for the measurement of the orientation of the obstacle. In the hope of adding intelligence to the values, and the shopping cart is designed in such a way that it could allow for ease of use. The idea is to reduce human efforts and the detection of objects that are virtually devoid of any point of contact, with the aid of sensors. Proximity sensors use high-frequency to detect any obstacles in the vicinity of the sensor. This paper represents the software and hardware design of the automatic transmission trolley.

Index Terms—Smart Shopping Cart, ESP8266 NodeMCU, Micro-controller, IR Sensors, DC Motors

1 INTRODUCTION

Currently, many shops provide consolation one in all that is in buying cart. It's far used for in-shops clients to move items on the checkout during a purchase.

Purchasing carts changed into founded in 1937 as a spin-off of a brandnew way of purchasing that was famous in 1920: the grocery keep. This turned into stimulated through the idea of grocery keep proprietor sylvan Goldman, who got here up with a manner to inspire clients to shop for items in his Humpty dumpty thru a sequence of retail stores. He was getting plenty of proceedings from clients as it became difficult for them to carry products from the shop. Goldman turned into looking to resolve this trouble and started experimenting with carts in the store. He positioned the basket on a horse-drawn carriage with small wheels to carry the groceries. To facilitate and meet with his customers, he requested me to be an engineer to create a present-day shopping cart and patent an invention. Because at that point, the cart is fabricated from it. Nowadays, in a contemporary grocery keep, we can find many shopping carts.

After Sylvan Goldman, there are numerous forms of research and discoveries in enhancing the cart. In 2009, scientists started out growing prototypes of pc-generated contextual shopping carts, extracting pills for classic fashions. The system aims to help you store at grocery stores and attract users' attention. Consequently, an interactive doll helps clients recognize and find new products. Early experiments have shown that a prototype can improve and remodel the buying experience. Additional research has commenced integrating a buying cart with a cell robotic-this is the idea. The prototype is to integrate a shopping cart with a transportable cellular robotic with human-like accompaniment.

The reason for this paper is to design an automatic shopping cart that gives desirable use and efficiency for customers especially the aged and disabled clients, disposing of human performance to push heavily loaded vehicles. Our purpose consists of keeping off collisions with limitations and

locating reachable routes and informing customers at the same time as the cart is blocked. To reap those goals, we designed the complete module based totally on our choice for a micro-controller, Arduino, because it has a nice running platform for clients and a sufficient processing pace that satisfies the want for our project. Our task can run mechanically under the power of two 12v dc engines, the energy enter is managed through Arduino to regulate the moving speed. The 3 IR sensors are embedded in the front, left, and proper of the cart, to decide which direction is on the market and to alarm clients while obstacles are detected of their variety. Our foremost microcontroller, Arduino, serves as facts transfer and processing middle.

2 LITERATURE REVIEW

2.1 LITERATURE SURVEY

Several ideas for smart shopping carts have emerged so far to bring about change in the design of electronic goods with new ideas to improve the shopping experience and reduce human efforts.

2.2 PREVIOUS STUDIES

In the store, just as it is in the shop, with a pram/stroller or trolley, by cart, it should be expressed at the time of purchase. It is traditionally used by customers to the store to get the goods to the seller in the store and not have to leave them behind in the store. This is a waste of time and a waste of my time, for those customers who would like an item in a store with the help of a traditional shopping cart. Their goal is to develop automatic transport, traffic, and operation of the smart device, make purchases to solve this problem. With our smart cart which is based on a two-wheeled mobile robot developed in our previous study. This paper describes the hardware and software design of a new type of trolley system. Our smart cart is an IOIO microcontroller and an Android smartphone such as sensors and controllers. The carriage was filmed as a two-wheeled mobile robot. An Android smartphone to control the robot by sending a message to the

IOIO microcontroller is connected to the robot's drive system, as well as the monitoring of the situation with the help of the camera of the smartphone. In addition to this, we are using a smartphone app to control the robots. The system is also equipped with an internal positioning system to record the location of the user, with the help of the Nuvisan, based on the gyroscope and the accelerometer of the phone. The results of the robot's navigation, the tests will be listed at the end. This is the result of the smart cart system, which is a Navisen the frame to move and to show the location of the user [1]. Technology in the retail sector has improved over the years. technology, starting with tools that will help you enjoy shopping, payment methods, or making online stores that offer an online store for smartphone apps. Scientists and industrial companies are developing new types of technologies and concepts in the hope of finding the best shopping experience in our modern society. This review of the literature will take into account some of the new technologies currently being developed as a recent process in the feasibility study. Technologies considered to be the case for smart shopping, VR Shopping, and just Go Shopping are also supported by relevant research and literature. The findings of the analysis are discussed in this study on issues such as market inclusion issues, technical issues, financial issues, management issues, and risk definitions. The research is based on a plan of action to be completed [2] To reduce waiting times in the grocery store checkout lines, and is one of the most important tasks is to enhance the customer's shopping experience. In this article, we suggest that the use of the accompanying RFID-enabled technology is the guarantee to your cart to create a system for trading. All of the strollers in the mall, and were also used in combination with RFID tags. If the product is in the fact that an RFID tag, is placed in your shopping cart, and payment information and the shopping cart is updated to read on to find out more information about this product. Make purchases with the use of smart cards, which can also be used in conjunction with an RFID reader. This will help you keep track of all of the items in the shopping centre, and is, therefore, how to improve your supply chain management. In addition to this configuration, the LCD display has been installed in the shopping cart to see the detailed information about the products in your cart have been loaded, with the total cost of all the products you use. The mobile point of sale (pos) terminal can be placed in your shopping cart, so that the customer can make a payment without standing in a long queue at the ticket office. The processed information is stored in a database so that it can be used for analytical purposes in the future [3] Shopping is an essential tool for shopping in supermarkets and convenience stores. There is also the fuel for safety and security, such as getting to the front door. The reason for the computer-aided trailer design and has been equipped with a smart commercial appliance for the solution of the problems. The article describes the software and hardware development of the automatic transmission jack. The results of the sensors, which are used as ultrasonic sensors, INFRARED sensors, it is provided as-is.[4]. Today, the grocery store, you know, almost turned into a major technological breakthrough. People have to buy different items in the grocery store and put them in the basket, this is the easiest way to do that, you can use it at the grocery store to get the goods to be transported. However, during the whole

process from purchase, customers will have to push the car by hand but are independent of each other, and to the calculation, the customer will have to wait in line for a long period of time to pay the bills. This is a time-consuming process, because of people's busy schedules. To overcome these problems, research is being conducted to provide an efficient and complex system. Taking this into account, in the shopping malls, you can use this technique as a strategy to increase the number of customers. So, we thought we'd find the solutions for the product, to begin with, this problem. Or, as we like to call it, "A smart shopping cart that can be used to make the payment [5].

2.3 SALIENT FEATURES OF LITERATURE

1. The literature discusses some of the new technologies currently being developed or recently introduced based on possible experiments.
2. Technologies considered to include Smart Shopping Cart, VR Shopping, and Just Walk Out Shopping are also supported by literature-related research.
3. The papers also represent the software system and hardware design of the automatic transmission.
4. They suggest the use of RFID attached to a shopping cart to design a smart shopping system.ate files.

3 CONSTRUCTIONS

3.1 REQUIRED SOFTWARE AND HARDWARE

1. Android Blynk app
2. Arduino IDE Software
3. Microcontroller ATmega328P
4. Infrared Sensors
5. NODEMCU
6. Motor Driver
7. Motors
8. Battery
9. Wires
10. Cart

3.2 SETTING UP APP AND ASSEMBLY

1. In order to start. Click on the New project by the name of the project the "Add to Cart" to select your device as the "ESP8266" and select "Wi-Fi".
2. As soon as you click on the "Create" button, Blynk will send an e-mail with the project, which is the authentication token that is, the code is used.
3. After you create the project, add a few more buttons and then press the "+" button.
4. After the addition of the button,
5. Customize the app interface by adding buttons according to need.
6. Get the source code.
7. We will use the ESP8266 development board to the source code is available for download.
8. How to install a Bot to ESP8266.
9. After you have downloaded the source code, it has to be done.
10. Select the ESP8266 and a motor driver module with

battery-free and IR-sensors.

11. We will also make use of a dual-motor, and so that the bot can't move back and forth.
12. Note: Before you start, you will need the SSID and password and the verification code into the source code of the program. After the change of the source code, click on Download is.
13. After installation, open the Blynk app.
14. Please select the Blynk project, and then click on the "Play" button.
15. The project has been started.

As Blynk is an IoT platform, and the walker can be controlled over the Internet with the help of a mobile app, from anywhere in the world.

3.3 BLOCK DIAGRAM OF CONNECTONS OF HARDWARE COMPONENTS

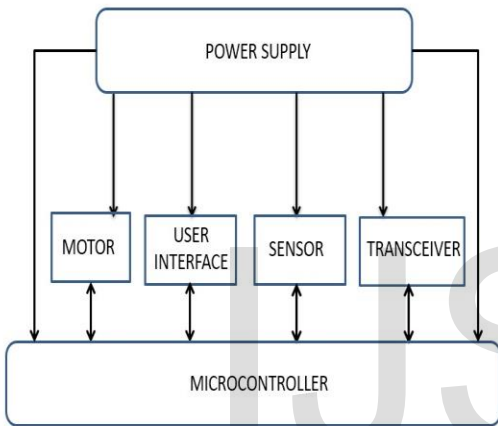


Fig 1 : Block Diagram Of Mobile Operated Shopping Cart

3.4 WORKING

The (IR) sensor to identify objects at a distance, from the shopping cart, if there is an object that is close to the shopping cart, the sensor will communicate with the microcontroller and the microcontroller will have to collect it, and other things that will be connected to the IR-sensor and alarm, flexible, and avoid the object.

For example, if:

If there is an obstacle in the path of the vehicle, the machine will stop automatically if the INFRARED sensor, sends the data back to the controller, and it will be sent back to the engine to stop running.

4 DESIGN AND INTERFACE OF MOBILE APP



Sr. No.	Components
1	Motors and Electronic components
2	IR sensor for collision prevention
3	IR sensor for counting number of items

Fig2: 3D Design of Cart and Electronic Components

ALL DIMENSIONS ARE IN mm

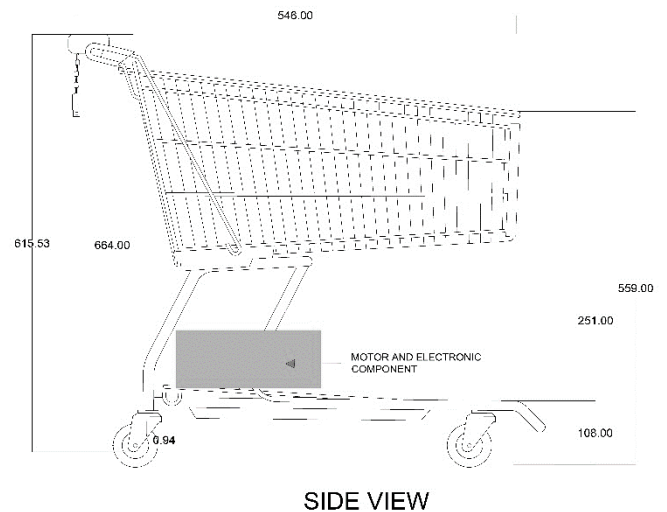
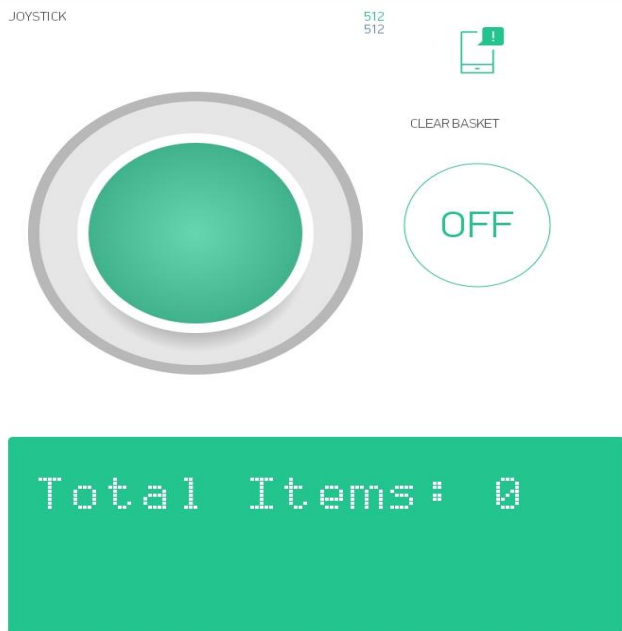


Fig3: 2D Design of Cart and Electronic Components

Fig4: Final Interface of App



5 RESULT

1. It can be easily used for the transport of goods in grocery stores, or accordance with the requirements of the client in the DC motors will be used to provide for the transportation of the automatic movement. If you prefer, you can also make use of the DC motors of different specifications.
2. The cart can be controlled with a smartphone connected to Wi-Fi on your mobile phone.
3. Collision prevention has been successfully implemented to reduce the collisions and, as a result of your negligence. (IR) sensors are used to detect obstacles in the vehicle the way.)
4. Now you can enjoy shopping without the push of a cart.

6 CONCLUSION

The main purpose of this article is to design a shopping cart with the help of a smartphone. The purpose of our project is being fulfilled as it reduces people's efforts which will be of great benefit to customers with disabilities or the elderly. Also, the cart will reduce collisions caused by customer carelessness while shopping at supermarkets also with product counting.

REFERENCES

- [1] Alexander, A. S. G., Valdi, S., Albertus, F., Heri, N., Widodo, B., Herman, T., Muhammad, A. (2019) "Development of Smart cart System Based on Android Smartphone Sensors" Jakarta: 4th International Conference on Computer Science and Computational Intelligence 2019
- [2] "A literature review: Feasibility Study of technology to improve shopping experience" Heraldo Y Purwan-

tono^aAlexander A SGun-
awan^bHerman Tolle^cMuhammad Attamimi^dWidodo Bu
diharto^e

- [3] Hiba Sadia, Shubhansujee, Krishnendu Pal, Shikhar Singh, Mebansharai Marbaniang "Iot Application Based Advanced Shopping cart" International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-8 Issue-4, April 2019
- [4] Rastogi S., Singh P.K., Agarwal V. "An Intelligent Sensing Follower Cart (AUTOMATIC SHOPPING cart)" Journal of Controller and Converters (2017), pp. 21-25
- [5] Titarmare, S. T. (2017, Februari) "RFID Based Smart Shopping cart with IR Sensor". National Conference on Advances in Engineering and Applied Science. Nagpur, Maharashtra, India (TechnoScience Academy) 139-143
- [6] YL Ng, CS Lim, KA Danapalasingam, MLP Tan, CW Tan Automatic Human Guided Shopping cart with Smart Shopping System Jurnalteknologi., 73 (3) (2015)
- [7] Omar, R., Makadessi, M., Mohamad, Y., Damaj, I. (2018) "SysMART Indoor Services: A System of Smart and Connected Supermarkets" IEEE in 31st Canadian Conference on Electrical and Computer Engineering.
- [8] Farley, A., Stevanus, V. (2018) "Swarm Android Mobile Robot: Smart cart Application" School of Computer Science Universitas Bina Nusantara
- [9] Sainath, S., Surender, K., Arvind, V. V., & Thangakumar, J. (2014). Automated shopping cart for super market billing system. International Journal of Computer Applications, 3, 7-8
- [10] Altarteer, S., Vassilis, C., Harrison, D., and Chan, W. (2016) "Product Customisation: Virtual Reality and New Opportunities for Luxury Brands Online Trading" 21st International Conference on Web3D Technology, Anaheim, California: ACM: 173-174.
- [11] Aishwarya, S. S. (2018, April) "Smart Supermarket Trolley System Using RFID" International Journal of Trend in Research and Development, 529-531.