THE SMART SHOPPING TROLLEY

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Abstract

The development of machines in the modern world is being facilitated by the expansion of technology. Shopping at the supermarket has become challenging because of the long lines, the barcode billing system, and the number of individuals who struggle to push the trolley once it is loaded. This paper introduces "The Smart Shopping Trolley" to assist customers in routine shopping and to shorten the time spent shopping. We also want to develop a sensor that enables customers to manoeuvre the trolley effortlessly and without any difficulty[1]. In this context, a smart trolley powered by the Internet of Things (IOT) is suggested. It includes sensors, an RFID reader, an RFID tag, LED lights, an LCD touch panel, and a Beagle Bone Black Board. Each product can have a cheap RFID tag affixed to it that, when placed in a smart shopping cart, can be read by a cart with an RFID reader automatically[4]. As a result, billing is possible right from the purchasing basket. These features will save waiting time and facilitate shopping. The finest purchasing experience is generally attainable.

Index Terms - **RFID reader, RFID tag, LCD touch screen, LED lights, Beagle Bone Black Board and Sensors.**

I. INTRODUCTION

The industry has made a lot of effort to increase productivity, improve efficiency, and eliminate any mistakes. Due to the lengthy billing line waits, shopping has become a significant issue. The survey found that adults spend roughly 1-1.5 hrs for shopping, and the majority of people will usually leave a line if it is too long[1]. An intelligent shopping system can be implemented to prevent this issue. This shortens the customer's billing period and eliminates the need for the user to wait in a lengthy line for billing. These are created based on the customer's needs and are managed by a central communication system using an IOT platform[5]. IOT and RFID technology are both used by this system. An RFID tag, RFID reader, LCD touch screen, LED lights, Beagle Bone Black Board, and sensors are all used in the smart trolley. The merchandise has an RFID tag affixed to it. The RFID reader immediately scans the item when it is placed in the trolley, and the information about the item's name, price, and quantity is shown on the LCD touch screen[3]. Once the consumer has finished buying, the server is notified, and all that is required of them is to pay the invoice and walk away from the counter. Thus, it has the ability to improve the customer's buying experience by making it more enjoyable, simple, and effective. IOT is used across the system to communicate[6].

II. WORKING

The Beagle Bone Black board with IOT integration serves as the primary controller for this trolley. When it comes to scanning, billing, and payment, RFID is a cost-effective solution. The RFID reader, Beagle Bone Board,

LCD touch screen, LED lights sensor, and RFID tag linked to the merchandise are all included in our proposed system's smart cart. The Beagle Bone Black Board stores the data collected from the RFID tag that is read by the RFID Reader that makes up the entire smart cart. As soon as a consumer places a product in the cart, the RFID tag on the item is instantly scanned. The database contains all of the product-related data connected to the RFID tags[2]. When a product is added to the basket, its details are displayed on the LCD screen; when the product is removed, the data automatically vanish from the LCD touch screen. The bill will be generated on the LCD touch screen once all the items have been purchased at the conclusion of the shopping trip. The customer must make payment at the billing counter right away. A Beagle bone board with built-in wifi modules is part of the system. The touch sensor, which makes the cart easy and smooth to move, is another intriguing aspect of this cart[7]. A Beagle bone board with built-in wifi modules is part of the system. Another intriguing aspect of this cart is the touch sensor which enables easy movement of the cart [7].
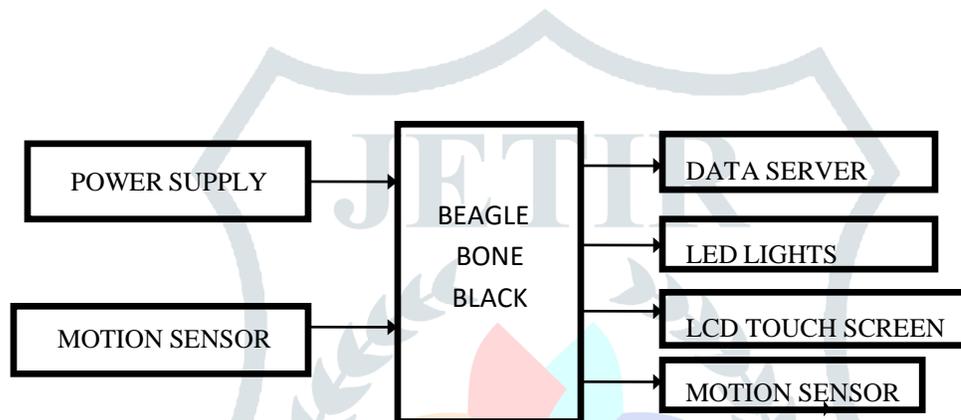
III. BLOCK DIAGRAM

Fig 1: Block diagram of smart trolley

- **BEAGLE BONE BLACK BOARD:** It is used to control all the components of the system.

- **RFID READER:** Radio frequency identification reader (RFID reader) is used to gather information from an RFID tag, which is used to track individual objects. Radio waves are used to transfer data from the tag to a reader.

- **WIFI:** It is in-built in beagle bone black board and is used to communicate information between the trolley and server.

- **DATA SERVER:** It is a system in which all the components are connected.

- **LED-LIGHTS:** The function of this is to provide a green light when the customer scans the product to indicate that the product is scanned.

- **MOTION SENSORS:** This function provides easy and smooth movement of the cart.

IV. ALGORITHM

Step 1: Start

Step 2: Pick the product attached with an RFID tag and drop it into the trolley.

Step 3: The RFID reader reads the tag information.

Step 4: The beagle bone board sends this information to the server.

Step 5: The server stores the information in the database.

Step 6: The total amount is calculated into the server.

Step 7: Final amount gets displayed on the server.

Step 8: Payment of the bill.

Step 9: The database is updated.

Step 10: Stop

V. CONCLUSION

As a result, we conclude that automatic product billing utilizing the RFID approach will be a more practical choice in the future. The system built using the RFID technology is effective, small, and shows promise[1]. Additionally, barcode reading takes longer and is slower than RFID because the latter relies on line of sight, whilst the former does not. The overall shopping experience will be elevated as a result. The smart trolley system parameters, such as the product name, cost, and other information, are shown.

This system is a feasible and easy solution for making the shopping field more digitized as well as user-friendly. This system is only making shopping easy but also the administration can do the work   more smoothly and at a fast pace.

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