

Smart Shopping Facilitator For Blind

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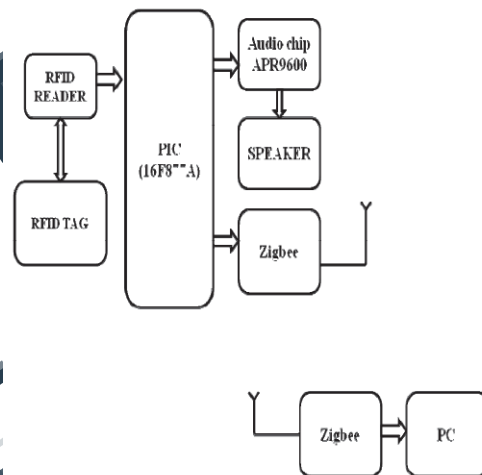
Abstract: This project aims on assisting the visually impaired people for being self-reliant and self-sufficient. It facilitates easy shopping, saves customers' time and promotes business sales. The facilitator is mounted on the trolleys available in the super markets. Here we make use of RFID technology which is the simplest and most efficient technology for object detection and identification while shopping. The RFID technology consists of RFID Reader and RFID Tags. RFID Tags will be mounted on the shelves in the shops which are powered by the RFID Reader while making contact. An audio module APR9600IC is used here. It is interfaced with the PIC16F877A. The RFID Reader detects the object, identifies it and converts it to a unique EPIC (Electronic Product Identification Code) with the help of the audio module. The audio file, furnishing the details of the identified product corresponding to the code is played to the user with the help of a speaker. If the user requires the identified product the user can press the switch which will direct it to billing system via a ZigBee.

Keywords: PIC, ZigBee, Audio Module

INTRODUCTION

In this smart world, no one can end up the day without using any kind of embedded system products. It makes our human life very smarter and to feel comfortable. In worldwide, the great regret factor is visual impairment. Based on the statistics of World Health Organisation (WHO) in 2012, 285 million people are visually challenged in the world. Among them 39 million people are blind and 246 million having low power vision. About 90% of them are living in developing countries [1]. Lot of electronic products are introduced for visually impaired but all having some sort of drawbacks such as complexity in operation, need of more practice, higher cost, expensive design methodology and installation, non optimized data, more time consuming and tough maintenance. By considering these issues, if the embedded product is used for visually impaired and blind people, it will be really worthy [2]. The identification systems are already available for them. At present in the case of shopping there is no such embedded product. Shopping is one of the interesting things for every human. But this simple task cannot be easily achieved by the blind. They need others help for satisfying their own requirements. RFID is the simplest and efficient technology which can be used for object detection and identification in many applications such as supply chain management, objects tracking, antitheft applications, logistics.

I. ARCHITECTURE



A. RFID SYSTEM

It comprises of two components, a tag and a reader which operates in a certain frequency. It normally operates in ultra high and 13.56Khz and 125 KHz frequencies.

B. PIC MICROCONTROLLER

The whole system is controlled by PIC16F877A. It is a 8 bit microcontroller and adopts RISC architecture.

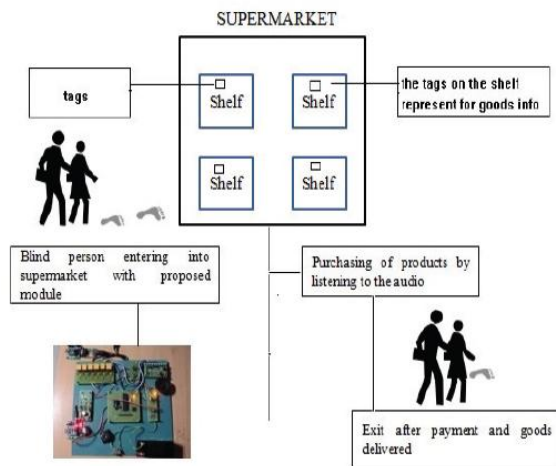
C. APR9600 IC

It is used for conveying information to the visually impaired user through audio information. Being non-volatile, low cost IC it become more convenient. It is connected with the speaker which gives high quality low noise signal.

D. ZIGBEE

It is the communication protocol used to transmit and receive the information between two nodes. This uses its transmitting network technology, due to its end-to-end acknowledgement property.

II. SYSTEM DESIGN



The figure shown shows the entire structural system design. In the supermarket the entire commodities are isolated and placed in shelves. The passive RFID tags transmits radio signals which is placed in shelves, are powered by RFID reader. The microcontroller receives unique EPIC (Electronic Product Identification Code) and process the code. The received code is identified with the corresponding audio signal. Once the blind person decides to purchase he wants to push the button in the module (in this module two switches are used). Then the information is sent to billing system through zigbee.

CONCLUSIONS

The system is very innovative, practically useful for the visually impaired people and realized as a prototype. By using this fully automated product, they can stand on their own leg at the time of shopping. It does not need more skills to operate, overcomes the hesitation and giving confidence for purchasing their shopping needs. With the help of RFID readers and tags, visually impaired people can get to know the objects information easily. The proposed system effectively implemented by using PIC microcontroller for providing simplicity, efficiency and portability with low cost. It makes the better use of RFID and Zigbee technologies for providing the smart environment for visually impaired. This will be the efficient real time embedded product in supermarkets and improves the business sales. In future the proposed system will be designed as a portable device and integrated with the trolley (used to dump the purchased products in the supermarkets). To avoid collision among the blind people and for obstacle detection, ultrasonic sensors will be mounted in the trolley.

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