

Self-Assisted Object Selection Guider System

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Abstract— The project is aimed at providing audio information about any object by using ARM controller with Zigbee interface. Radio frequency identification reader module will provide connection between radio frequency identification card and itself. Whatever seen by eyes, can be listened in ears immediately is the main feature of this project. Providing audio information about the object to the person that he/she sees instead of reading it for the long time makes the museum or any shop advanced. Can be used at the libraries to give summary about the book in audio format. Accuracy of the detection of the RFID card is maintained. People who are visually impaired can also use this system if they are eager to know about. The voice signals or audio files after detection are played through server (computer or laptop).

Key words: ARM, RFID, Zigbee

I. INTRODUCTION

Self assisted determination, the combination of skills, knowledge, and beliefs that enable a person to engage in goal directed, self-regulated, autonomous behavior, has become an important part of special education and related services for people and especially for the people with disabilities. There were some systems introduced earlier which were helpful for blind peoples to assist themselves by their own. Self assistance is not only helpful for just blind peoples but in case of automated world, self assisted technology works better, which will work instead of any human being for guidance. Earlier, there was a system, which was based on voice signals and had developed for the industry purpose. In that, whatever the processes had to be done, that processes were done on the commands delivered from the voice signals, so no need of worker here[1]. Then after, another system for blind peoples had come into picture, as person touches his/her finger on the letter of any line of book, it will captured by camera which will fit on the finger of that blind person, and person will hear the pronunciation of that letter or the complete word by voice signal[2].

Again there was a case of navigation for blind people, then a system has been developed which will guide the blind person about navigation by voice signal [3].

So, as taking reference from these systems we are making an effort to develop a system, which will based on voice signals but not as command nor as navigation indicator, the voice will provide information about a particular device or object, and not only for blind people, also for all.

System introduces RFID system as a guided element. Particular RFID cards are placed on object. RFID detector circuit is given to person. When person goes to the object RFID detector circuit detect that code & transmits the code to the circuit which is connected to PC. According to that code received, previously stored information in audio

format is played. Through wireless microphone, information is provided to the person regarding that object.

There are few people who are illiterate and may not be able to read information; this system is helpful in such cases. Also blind people who are keen to get information about the object he/she wants to take or buy can use this technology very easily. The most effective part of this system is the audio file will be in any of three languages as English, Hindi and Marathi. So, anyone can change the language preference as he/she wants.

II. LITERATURE REVIEW

A.K.Gnanasekar and P.Jayavelu has developed a system which will provide integrated voice based control of technologically smart systems of an industry using microcontroller with visual basic interface. It means that the functionality in the industry are controlled based on voice command that provides e-lifestyle to the operator.[1]

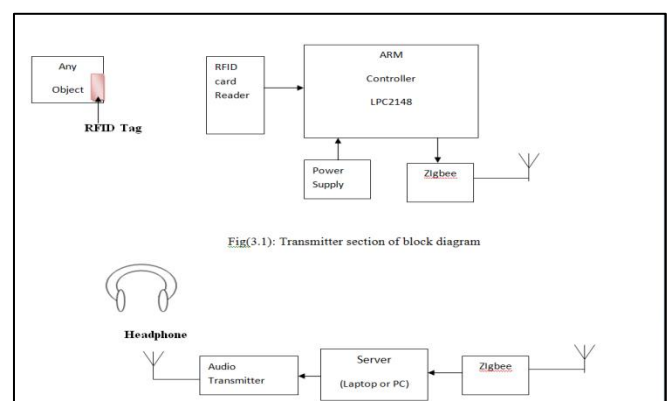
Sanjana.B and J.RejinaParvin has developed a system which will be a self-assisted text to speech module in order to make them read and understand the text in an easier way. It is not only applicable for the visually impaired but also to any normal human beings who are willing to read the text as a speech as quickly as possible.[2]

Anushree Harsur and Chitra.M developed a system which permits blind persons to explore autonomously in the outside environment. System gives indications about navigation and obstacles using ultrasonic sensor to blind person via voice message.[3]

After observing all these systems, the proposed system have been introduces which will provide the short summary of any object with audio clip. RFID system works here as a transmitter and receiver. When any person goes near the particular object in museum the audio file related to that particular object will play and then person will hear that audio file with the help of wireless headphone.

This system will be not only useful for blind people but also for normal human being who are illiterate and eager to know about the object.

III. SYSTEM OVERVIEW



Fig(3.1): Transmitter section of block diagram

Block diagram contains RFID system as a transmitter, and server is set at the receiving side.

First, put the RFID card on the objects when launching any object in museum, adding new book in library or adding new CD in music shop, so it will give RFID tags for each of the objects. The audio file which contains the information related to that particular object is linked with the corresponding tag in database of server.

When any person is near to the object, he is provided with headphone and RFID reader system. When he chooses any object then he has to make contact between RFID tag and the reader. RFID reader detects the code linked to the tag and apply that signal to the Rx pin of arm controller. Here arm controller LPC2138 is used, which is powered up by power supply. Controller sends that detected code to the server through zigbee transmitter which is interfaced to controller.

At the receiving side, zigbee receiver accepts that data and informs to the server. Then server will go in its database, which includes all the audio files. After receiving the signal through zigbee, server compares the detected code with the files in the database, and when it matches it will transmit that audio file through audio transmitter to the wireless headphone.

So, the person can listen summary about the object he choose and according to that he will get guidance to select the object he wants.

IV. HARDWARE DESIGN

Hardware design comprises of power supply, ARM controller module, RFID module, zigbee module. Figures below shows the schematic of these three.

A. Power Supply Schematic:

Figure 6, shows the schematic of power supply is shown, that provides necessary voltage and current for the ARM controller. As ARM requires +3.3v, power output obtained from the circuit is converted from +5v to +3.3v with the help of LM317.

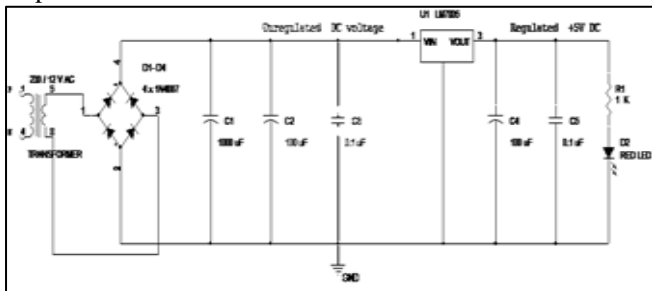


Fig. 4.1.1: Power supply circuit

B. ARM Controller Schematic:

Figure 7, shows the schematic diagram of ARM controller, the figure shows the pin diagram of controller, LPC2148 is used.

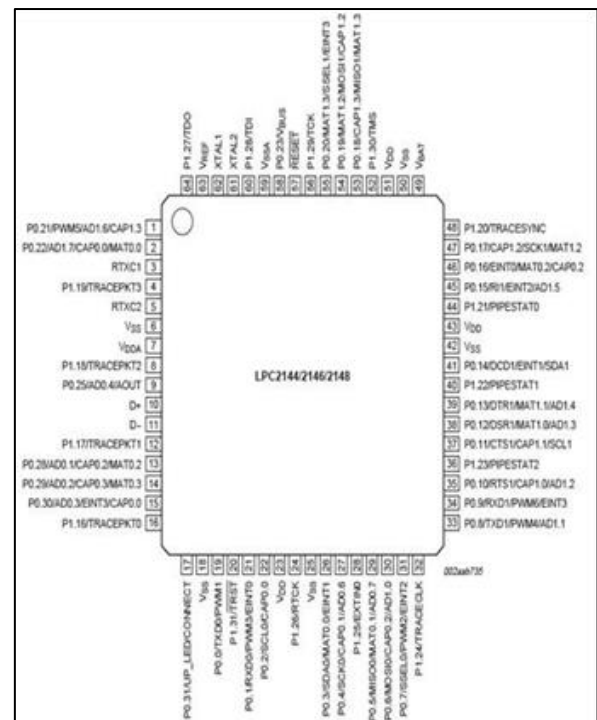


Fig. 4.2.1: ARM LPC2148 Pin out

C. RFID Module:

RFID module shown in figure 8, consists of RFID reader, rectifier for power supply purpose, buzzer for indicating detection, LEDs for indicating right or wrong detection.



Fig. 4.3.1: RFID Module

D. RFID Tag Card:

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information.



Fig. 4.4.1: RFID Tag Card

E. ZIGBEE Module:

Zigbee is an IEEE 802.15.4-based specification for a suite of high-level communication protocols used to create personal area networks with small, low-power digital radios. Hence, zigbee is a low-power, low data rate, and close proximity (i.e., personal area) wireless ad hoc network. Its low power consumption limits transmission distances to 10–100 meters line-of-sight, depending on power output and environmental characteristics

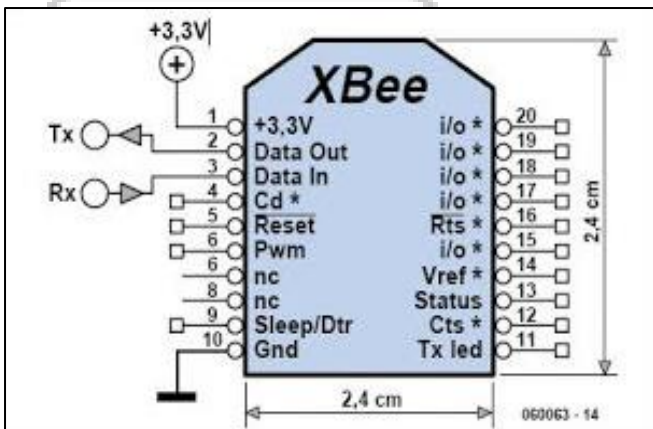


Fig. 4.5.1: Xbee Pin out

V. SOFTWARE DESIGN

Software part of this project involves programming of LCD interfacing to the ARM controller and the programming of controller for the operation of overall system. Another software part is at the receiving side when the audio files are stored in the database using software Visual Basics.

Following software are used for the software designing of the system:

- 1) Keil uVision4
- 2) Proteus
- 3) Visual Basics
- 4) Flash magic

VI. CONCLUSION

The system Self Assisted Object Selection Guider will be implemented soon. The system will definitely work as mentioned in this paper with a least 90% accuracy. This system can be used for museum, library or any music CD

shop. The system will be useful especially for the visually impaired people.

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