

ZIGBEE BASED AIRHOSTESSES ASSISTANCE FOR DEAF AND DUMB IN AIRLINES

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ABSTRACT

The main aim of this paper is to construct a user friendly multi-language communication system for illiterate/dumb people traveling by Airlines. As we have different languages in our world and its impossible for us to know all the languages. So, in this paper we are building a device that helps them in expressing their needs with other language people (Airhostess) i.e. request them if we need anything in the flight like coffee, tea, drinks etc. In this paper we use Touch screen Technology to make it easy even to illiterates as it is also included with images, which indicates the needs. This even reduces the difficulty to airhostess in receiving the customers with different languages. Here for wireless communication purpose we use Zigbee technology.

Keywords: Airlines, Zigbee,

INTRODUCTION

In this paper Touch screen Technology is used to make it easy even to illiterates as it is also included with images, which indicates the needs. This even reduces the difficulty to nurses in receiving the customers with different languages. Here for wireless communication purpose we use Zigbee technology. ZigBee is a wireless technology developed as an open global standard to address the unique needs of low-cost, low-power, wireless sensor networks. Zigbee is the set of specs built around the IEEE 802.15.4 wireless protocol. As Zigbee is the upcoming technology in wireless field, we had tried to demonstrate its way of functionality and various aspects like kinds, advantages and disadvantages using a small application of controlling the any kind of electronic devices and machines. The Zigbee technology is broadly adopted for bulk and fast data transmission over a dedicated channel. This project consists of Zigbee based system that transmits the wireless signals according to the input given by the user, using touch screen and LCD through images. At the receiver (nurses) end the information will be displayed on LCD in English language. Here when the user sends his need through a gentle touch on the images displayed on touch screen LCD, then micro controller transmits that information through Zigbee transmitter. The information received by the Zigbee receiver will be displayed on LCD. Whenever we go to any of the restaurant, it provides us menu pasted on the table or on a wall in the restaurant, a waiter or a staff is waiting at the table or come near to the table for taking the order from the customer and make the possible way to

serve us better, mostly the item name is written in the restaurant without any picture or the same picture is kept for more than many years for the same item. There are many reasons why a customer could get dissatisfied and one of the reasons is long time by the waiter to take the orders of the customer as number of waiters in the restaurant is less. There are also the chances of human error like waiter taking a wrong order and serving it to the different customer. Citing all the problems that are arising in the manual way, we are proposing a system which has all the functions in the digital form only which is a microcontroller, Arduino based system which consists of a touch screen which is mounted over a GLCD. The concept is we can see the menu at the table itself at fingertip. The items present on the menu are well described and defined along with the pictures, ingredients etc, wherein the customer places the order by selecting any of the items from different categories present and places the order by using the touch screen and the selected order is being served by the serving staff or it can be a self service.

Zigbee is a wireless technology developed by Zigbee Alliance as an open global standard to address the unique needs of low-cost, low-power, wireless sensor networks [5]. The standard takes full advantage of the IEEE 802.15.4 physical radio specification and operates in unlicensed bands worldwide at the following frequencies: 2.400–2.484 GHz, 902-928 MHz and 868.0–868.6 MHz The Zigbee used in this paper is Xbee Zigbee Module from Digi International. It can send data up to 30m and it has low power consumption (1mW for transmitting data). Xbee works in 2.4 GHz frequency and offers three modes of

operation; AT mode, Application Programming Interface (API) mode and API with Escape (ESC) character mode. API operation is chosen to be used in this project due to several reasons. Firstly, it can transmit data to multiple destinations without having to enter the command mode. Secondly, it can identify the source address of each packet and thirdly, it will receive update on the transmission status whether it is successful or fail.

LITERATURE SURVEY

A Touch Screen and Zigbee Based Wireless Communication Assistant: The principle point of this undertaking is to develop an easy to use multi-dialect correspondence framework for ignorant/imbecilic individuals going via Airlines. As we have distinctive dialects in our reality and it's inconceivable for us to know every one of the dialects. Along these lines, in this venture we are building a gadget that encourages them in communicating their necessities with other dialect individuals (Airhostess) i.e. ask for them in the event that we require anything in the flight like espresso, tea, drinks and so forth. In this task we utilize GLCD and Touch screen Technology to make it simple even to unskilled people as it is additionally included with pictures, which shows the necessities. This even decreases the trouble to airhostess in accepting the clients with various dialects. Here for remote correspondence reason we utilize Zigbee innovation[1].

In India itself there are over 2.7 million people with speech impairment. [2]. these speech disorders can occur at any age. Regardless of the severity, a person's ability to interact and communicate with others is affected. The speech impaired does not have any problem in processing their thoughts but only to express them. In the 21st century everyone has to have an equal opportunity to success. But the disabled people like the speech impaired face obstacles in their way to success just because of their disability. The obstacles are mainly due to the fact that they do not have enough resources to communicate their thoughts. The main motive of this paper is to implement a system such that it aides the speech impaired to communicate at least the basic needs. This communication could be between two speech impaired personals or between a speech impaired and a person with no impairment. To implement this system ZigBee technology is selected because ZigBee is a wireless technology developed as an open global standard to address the unique needs of low cost,

low power, wireless sensor networks. ZigBee is the set of specifications built around the IEEE 802.15.4 wireless protocol. [3]. as ZigBee is the reliable technology in wireless field, an attempt is made to demonstrate its way of functionality through ZigBee transmitter. The information received by the ZigBee receiver will be displayed on GLCD. 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. [4]. LANs and WLANs evolved and WPANs which were its part were used to cover small areas using less power required for transmission. The technology defined by the ZigBee specification is intended to be simpler and less expensive than other wireless personal area networks (WPANs), such as Bluetooth or Wi-Fi. Applications include wireless light switches, electrical meters with in-home displays, traffic management systems, and other consumer and industrial equipment that require short-range low-rate wireless data transfer., [5] An embedded system is a combination of software and hardware to perform a dedicated task. Some of the main devices used in embedded products are microprocessors and microcontrollers. Microprocessors are commonly referred to as general purpose processors as they simply accept the inputs, process it and give the output. In contrast, a microcontroller not only accepts the data as inputs but also manipulates it, interfaces the data with various devices, controls the data and thus finally gives the result. [6]. this system will be implemented by using not just ZigBee but also PIC18F452 and PIC16F73 microcontrollers. The system design can be divided into two sections; hardware and software implementations. The hardware implementation consists of the development of the Touch screen sensor, ZigBee and GLCD while the software implementation focuses on the programming of the microcontroller using Proteus 7 (Embedded C). : The new standards in the ISM radio band are frequencies 868 MHz, 915 MHz and 2.4 GHz. From these the frequency of 2.4GHz is used worldwide. There was a need for a standard communication and as a result the ZigBee Alliance created ZigBee. [7] ZigBee is a specification based on IEEE 802.15-4 standard used for high level communication protocols, creating a personal area networks from small and low-powered digital radio system.

ZigBee is capable of transmitting data by passing data through intermediate devices, reaching more distant ones, thus creating a network. The key components of a ZigBee network are- PAN coordinator, routers and end devices. All of them can be configured to deal with multiple applications as large as 124 simultaneously. [8] ZigBee is employed in applications which require a lower data rate, longer battery life, and secured networking. It has a defined data rate of 250kb/s. [9]. 4.2 Data Security in ZigBee: The encryption algorithm used is AES (Advanced Encryption Standard) with a 128bit key length (16 Bytes). [10]. It is really important to count with an unique kind of encryption method due to the fact that most of the 802.15.4/ZigBee transceivers have a specific hardware design to cope with this work at the electronic level (embedded low resources devices). The AES algorithm is not only used to encrypt the information but to validate the data which is sent. This concept is called Data Integrity and it is achieved using a Message Integrity Code (MIC) also named as Message Authentication Code (MAC) which is appended to the message. [11] This code ensures integrity of the MAC header and payload data attached. It is created encrypting parts of the IEEE MAC frame using the Key of the network, so if we receive a message from a non-trusted node we will see that the MAC generated for the sent message does not correspond to the one what would be generated using the message with the current secret Key, so we can discard this message. The MAC can have different sizes: 32, 64, 128 bits, however it is always created using the 128bit AES algorithm. Its size is just the bits length which is attached to each frame.

JiasongMuLiangHan et.al. said that The ZigBee network is widely studied and deployed recently because of its low cost and simplicity features. However, the power consumption issue needs a further improvement since the application requirements are not fully satisfied.

EXISTING METHODS

In the existing model of assistance system for dump people in airplanes using manual mode of operations. When the passenger feels emergency condition for everything we need to call airhostess for help. It's very difficult and time taking process. Airhostess will assist passenger in limited time so this system is poor to assist passenger. We are integrating wireless touch screen based assist system for easy way of approaching passengers in

any emergency conditions using wireless zigbee system.

PROPOSED METHOD

The methodology of this project design can be divided into two sections; hardware and software implementations. The hardware implementation consists of the development of the Touch screen sensor, Zigbee, Buzer, Arduino micro controller ,LCD and ARDUINO IDE integrated software

This having transmitting section and receiving section using zigbee

1. Transmitter Section

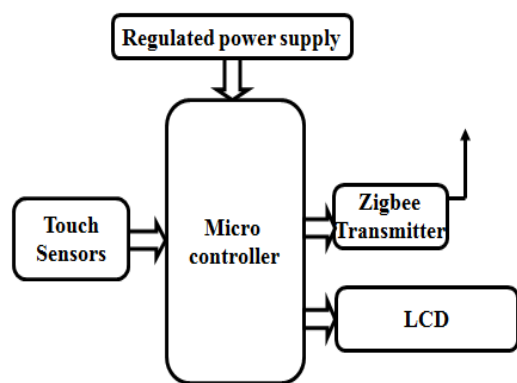


Fig.1: Block Diagram of Transmitter

The ZigBee Receiver will receive the data transmitted by the ZigBee transmitter. The microcontroller will process the data and it will be displayed in verbal form on the screen at the receiver system. LED indicators and buzzers are used for prompting the user that new data is available.

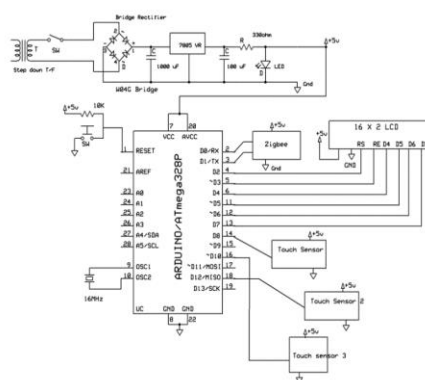


Fig .2: Schematic diagram of transmitter

Software

Architecture:

There are several different types of software architecture in common use.

- Simple Control Loop:

In this design, the software simply has a loop. The loop calls subroutines, each of which manages a part of the hardware or software.

- Interrupt Controlled System:

Some embedded systems are predominantly interrupt controlled. This means that tasks performed by the system are triggered by different kinds of events. An interrupt could be generated for example by a timer in a predefined frequency, or by a serial port controller receiving a byte. These kinds of systems are used if event handlers need low latency and the event handlers are short and simple.

zigbee Receiver:

The ST-RX02-ASK is an ASK Hybrid receiver module. A effective low cost solution for using at 315/433.92 MHZ. The circuit shape of ST-RX02-ASK is L/C. Receiver Frequency: 315 / 433.92 MHZ, Typical sensitivity: -105dBm, Supply Current: 3.5mA



Fig .3: 315/434 MHz zigbee RECEIVER

CODING

TRANSMITTER:

```
#include <LiquidCrystal.h>
#include <stdio.h>
#include <SoftwareSerial.h>
LiquidCrystal lcd(6, 7, 5, 4, 3, 2);
int sw1 = 8;
int sw2 = 10;
int sw3 = 12;
pinMode(sw1, INPUT);pinMode(sw2,
INPUT);pinMode(sw3, INPUT);
lcd.begin(16, 2);
// Print a message to the LCD.
lcd.print(" Welcome ");
delay(1000);
delay(500);
lcd.clear();
```

```
lcd.setCursor(0, 0);
//serialEvent();
}
void loop()
{
if(digitalRead(sw1) == HIGH)
{delay(400);
while(digitalRead(sw1) == HIGH);

lcd.clear();lcd.setCursor(0,0);lcd.print("Chairm
an Sir ");
lcd.setCursor(0,1);lcd.print(" Meeting ");
Serial.write("*1#");
}
if(digitalRead(sw2) == HIGH)
{delay(400);
while(digitalRead(sw2) == HIGH);

lcd.clear();lcd.setCursor(0,0);lcd.print("Secreta
ry Madam");
lcd.setCursor(0,1);lcd.print(" Meeting ");
Serial.write("*2#");
}
if(digitalRead(sw3) == HIGH)
{delay(400);
while(digitalRead(sw3) == HIGH);

lcd.clear();lcd.setCursor(0,0);lcd.print("HOD
Sir Meeting");
Serial.write("*3#");
}
}
void RecieveData()
{
if(Serial.available() > 0)
{
data_temp = Serial.read();
RFID_data[read_count] = data_temp;
read_count++;
}
}
```

RECIEVER CODE :

```
#include <LiquidCrystal.h>
#include <stdio.h>
#include <SoftwareSerial.h>
SoftwareSerial mySerial(A4, A5);
LiquidCrystal lcd(6, 7, 5, 4, 3, 2);
int buzzer = 8;
void beep()
{
```

```

digitalWrite(buzzer,
LOW);delay(2000);digitalWrite(buzzer,
HIGH);
}
void setup()
{
Serial.begin(9600);
mySerial.begin(9600);
pinMode(buzzer, OUTPUT);

digitalWrite(buzzer, LOW);
lcd.begin(16, 2);
// Print a message to the LCD.
lcd.print(" Welcome ");
delay(1000);
delay(500);
lcd.clear();
lcd.setCursor(0, 0);
}
void loop()
{
if(stringComplete)
{
if(gchr == '1')
{

lcd.clear();lcd.setCursor(0,0);lcd.print("Chairm
an Sir ");
lcd.setCursor(0,1);lcd.print(" Meeting
");beep();
}
if(gchr == '2')
{

lcd.clear();lcd.setCursor(0,0);lcd.print("NEED
FOOD");
lcd.setCursor(0,1);lcd.print(" Meeting
");beep();
}
if(gchr == '3')
{

lcd.clear();lcd.setCursor(0,0);lcd.print("NEED
MEDICINE");beep();
}
if(gchr == '4')
{

lcd.clear();lcd.setCursor(0,0);lcd.print("EMER
GENCY");beep();
}
sti=0;

```

```

inputString = "";
stringComplete = false;
}
}
void RecieveData()
{
if(Serial.available() > 0)
{
data_temp = Serial.read();
RFID_data[read_count] = data_temp;
read_count++;
}
}
}

```



Fig 4: Receiver Section output

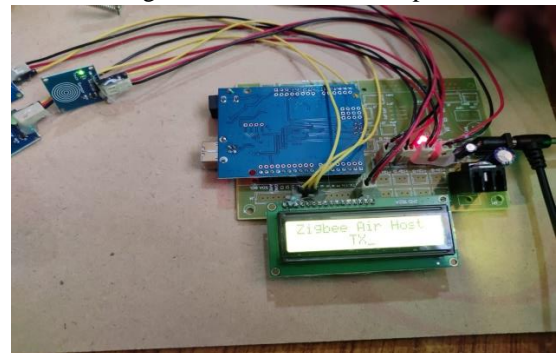


Fig 5: Transmitter output

CONCLUSION

The main aim of this paper is to construct a user friendly multi-language communication system for illiterate/dumb people traveling by Airlines. As we have different languages in our world and its impossible for us to know all the languages. Thus the project has been successfully designed and tested. This project consists of Zigbee based system that transmits the wireless signals according to the input given by the user using touch screen. At the receiver (nurses) end the information will be displayed on LCD in English language. Here when user sends his need through touch screen, then micro controller transmits that information through Zigbee transmitter. The information received by the Zigbee receiver will be displayed on LCD. This project provides an

efficient device that helps dumb/illiterate to communicate with nurses in airlines..

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