Android Based Self-Help Guiding System with Text and Audio Visual Information Using Bluetooth & Android Technology

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Abstract - **Android platform is a new generation of smart mobile phone platform launched by Google. Android and Bluetooth technology provides the support of tourist guide system, which is probably a concern of vast numbers of developers. In our app, we develop a tourist guide system which provides the information about the place of the particular city Android based self-help guiding system with text and audio visual information using Bluetooth & android technology is an essential whenever we are visiting a particular city It gives us the valuable information about the city and saves the time. Our project gives the information about every place in the city without taking the help of any personal guide. You can search a city for its prominent places of the city user, and can get social and political information of the city, city culture, security, entertainment, Business, Hotels, Jobs etc This app contains the details of hotels, restaurant, malls, hospitals, police stations, historical places and temples. You can view all the information which is in attractive image view. This information is very useful for the one who need to know about the particular city.**

Keywords: PIC16F628a-E/P, memory unit, Bluetooth, android technology.

1. INTRODUCTION

In many tourist places, guides are not available to provide the information of that tourist place so to help tourist about direction and to provide information this project will be very useful. Also if any tourist comes in a city for first time then he is not aware of every place to be visited nearby that city. Also he is not aware of Lodges, Hotels, hospitals, police stations etc. in the city so to help those tourists. Also visually disabled persons are not able to read the information provided in text format so to help them audio format is also added. By the market survey finding this system is currently available in the market they are as follows:

1.1 Web Based Information System for Tourism Resorts

  With the World Wide Web, people have access to more tourism information than ever before. However, too much information from too many sources has caused an information overload. Accessing information on the Internet has become less a question of determining whether the information is out there, but rather, in what form, and how to find it

1.2 Tourism Information System Based On Gis

From the geographical information system concept, discusses the main contents of the geographic information system, and the current of the geographic information system key technological measures of tourism information system, the application of tourism information system for specific requirements and goals, and analyzes a relational database model based on the tourist information system in GIS application methods of realization.

1.3 Audio Based Information System

In the big museums like Salarjang Museum in Bangalore, they have provided pre-recorded devices with audio clip and numeric buttons on it. Each article or picture placed in there is having a number written on it. User is supposed to press button on device which is displayed on article. The respective audio clip to that number is played in the device & user is supposed to hear it through headphone. While going outside, user is supposed to return it to the authority.

In this situation authority is supposed to give their valuable property i.e. device to user with keeping some deposit. This will increase the risk of the authority by two means. First is to keep eye on each user while going out, and second is responsibility of peoples deposit amount. Also investment in the device is much more.

Our System:

In our system we are placing the Bluetooth device on the article or picture or the place whose information is to be given. Device will be low in cost.SD Card is used as Memory unit to store the information of the same place. It will be in Text, Audio & Video Format. Microcontroller unit reads the information from memory unit and sends it to Bluetooth module which will then transmits it to auto paired device. Bluetooth module Auto pairs with the mobile Bluetooth which is having our app. It will automatically disconnect once information transmission is done so as to connect to next mobile device in range.

GPS system detects the locations at which our auto guiding system is installed and through our app it guides the user to selected destination. Mobile units equipped with our app will only have the access to auto guide system, others are not.

2. PRODUCT PERSPECTIVE

2. 1 System Design

I. Components & Features

Bluetooth module, microcontroller PIC16F628A, android technology, memory unit,

II. Feature of Components

1) Bluetooth technology

1. Bluetooth is based upon small, high performance integrated radio transceivers. Each of which is allocated a unique 48 bit address derived from the IEEE 802 standard

2. It operates in the unrestricted 2.4GH$_z$ ISM 'free hand', which is available globally, although slight variation of location and width of band apply

3. Bluetooth use the unlicensed ISM (Industrial, Scientific and medical) band 2488-2483.5MH$_z$ thereby maximizing communication compatibility worldwide.

4.the range is set at 10 meter to optimize for target market of mobile and business user the range can however be increased to 100 meter.

5. Gross data rate is Mbit/S with second generation providing increase to 2Mbit/S and further to 3Mbit/S.

6. Bluetooth uses packet switching protocol, based on a frequency hoping scheme with 1600hops/sec to enable high performance in noisy radio environment.

7. It has low power consumption, drawing only 0.3mA in standby mode. This enables maximum performance longevity for battery powered devices.

8. During Data Transfer the maximum current drain is 30mA. However during pauses or at lower data rates the drain would be lower.

2) Android Technology

1. Developer logging and analyzing enhancements

2. It is optimized for mobile devices.

3. It enables reuse and replacement of components.

4. Java support, media support, multi touch, video calling, multi tasking, voice based features, screen capture, camera, bluetooth, gps, compass and accelerometer, 3G

5. Android can run multiple apps at the same time Also support optimized graphics VGA, 2D graphics and 3D graphics...

6. Android lets you change your setting faster.

7. It gives you more options to fit your budget

8. Android keeps information visible on your home screen.

 9. Android also supports java applications.

3) Microcontroller PIC16F628A E/P

16 I/O Pins with Individual Direction Control

Internal 4 MHz and 48 kHz oscillator or External 20 MHz oscillator, 2 x Comparators, 1 x USART,

1 CCP (Capture/Compare/PWM), 2 x 8-Bit Timer,16-Bit Timer, 3.5 KB Program Memory, 224 bytes RAM, 128 bytes EEPROM, Operating Voltage Range – 2.0V to 5.5V, 25mA Source/Sink current I/O

4) Memory Unit AT24C256C

The AT24C32C/64C provides 32,768/65,536 bits of serial electrically erasable and programmable read only memory (EEPROM) organized as 4096/8192 words of 8 bits each. The device's cascadable feature allows up to 8 devices to share a common 2- wire bus. The device is optimized for use in many industrial and commercial applications where low power and low voltage operation are essential. The AT24C32C/64C is available in space saving 8-lead PDIP, 8-lead JEDEC SOIC, 8-lead Ultra Lead Frame Land Grid Array (ULA), 8-lead TSSOP, 8-lead Ultra-Thin Mini-MAP (MLP2x3) and, 8- ball dBGA2 packages and is accessed via a 2-wire serial interface.

III. Software and Language Used For Programming

1. Altium Designer Summer 2009 for PCB Design

2. Proteus for simulation

3. MPLAB IDE 6.8 for Programming

4. Java Compiler – JDK 6.0

2. Flow Chart of Working

In this paper we are installing each individual unit at each cave. Figure 1 is shown the general flow of the system This unit consists of Bluetooth device, which will be controlled by microcontroller section and a memory unit which stores the information related to that cave. Also GPS unit installed at each place where our system is installed.
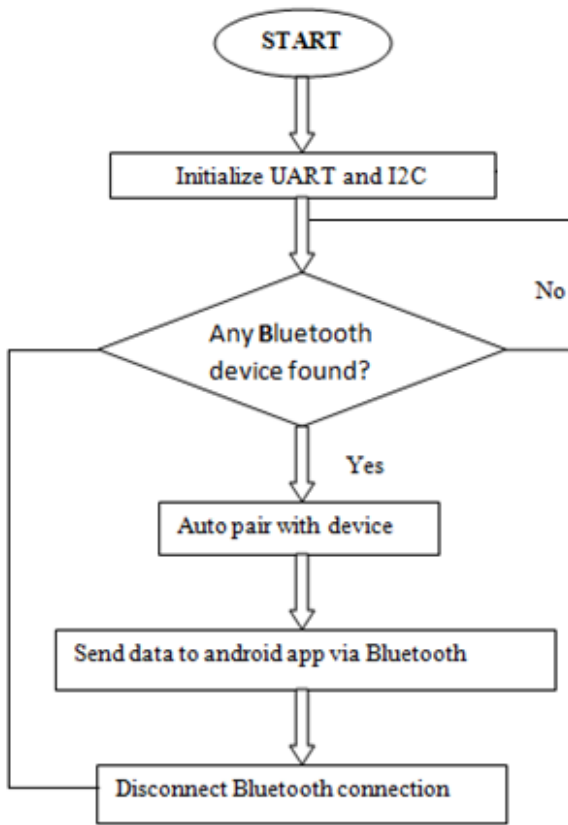
Figure 1: General Flow of the system

This system gives information about the locations of the system installed and will direct the user to that place. Receiver section consists of an Android base mobile app, which uses Bluetooth in mobile. When this app is ON and comes in the vicinity of the information transmitter section then automatic Bluetooth pairing takes place and the information related to that cave gets displayed on the App screen.
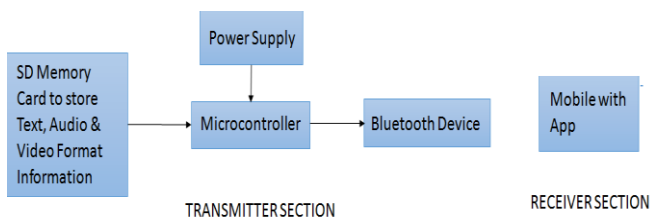

Figure 2: Block Diagram of the system

In the figure 2 show as a Memory unit or sd card is used to store the information of the same place. It will be in Text and Audio Format.
Microcontroller unit reads the information from memory unit and sends it to Bluetooth module which will then transmits it to auto paired device.
Bluetooth module Auto pairs with the mobile Bluetooth which is having our app. It will automatically disconnect once information transmission is done so as to connect to next mobile device in range. GPS system detects the locations at which our auto guiding system is installed

and through our app it guides the user to selected destination. Mobile units equipped with our app will only have the access to auto guide system, others are not.

3. GENERAL SYSTEM WORKING

This is an essential whenever we are visiting a particular city. It gives us the valuable information about the city and saves the time. Our project is android and Bluetooth based platform for the city guide and can search every place in the city without taking the help of any personal guide. You can search a city for its prominent places of the city user, and can get social and political information of the city, city culture, security, entertainment, Business, Hotels, and Jobs etc.

Existing System:
In Existing system the person who are visiting a particular city need to gather information from the person who is staying in the city or take the help of the guide in the city. Gather of all these information you need to visit the city. These posses a lot of time and pre-planning. In order to get each piece of information we need to go for help desk. figure 3 shows hardware of the system of our self help guiding app.
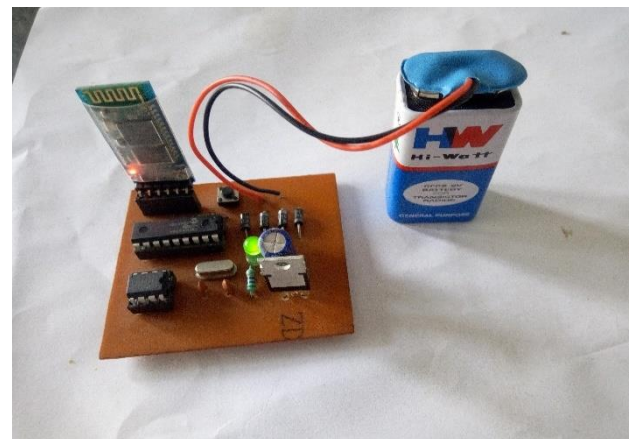

Figure 3: hardware of the system

City Guide Project Screen Shots Explanation:
Home page of the System
Description: The home page provides the necessary information that is accessed by the user and provides login form and registration for registration. The information in the home is open to all the users of the system.
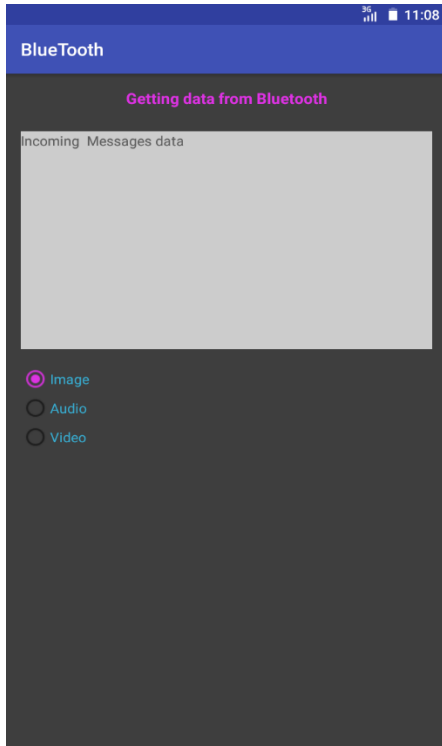
Figure 4: screenshots of the login app

Registration page

Description: The registration page helps the user to register in order to posses the various services offered by the site.

Login page Description: The registered User login with his id and password will be provides with various downloaded services and can access other city information. Every user will be provided with various services.

4. RESULTS

I. Range of Bluetooth

Bluetooth 1.0 can link up to eight devices within a radius of about 33 feet with a capacity, or bandwidth, of 700Kbps. A later revision of the Bluetooth specification, Bluetooth 2.0, can transmit at up 2.1Mbps within a radius of about 100 feet. Bluetooth 3.0, adopted in 2009, increased bandwidth to 24Mbps, while the Bluetooth 4.0 specification, adopted in 2010, has a theoretical range of up to 200 feet. The Bluetooth specification stipulates a minimum range of 33 feet, but the maximum range is determined only by the output power of the device. The maximum range you can expect to achieve from a Bluetooth connection varies widely with several parameters:

> The quality of the transmitter, and the transmit power of the system

> The sensitivity/noise floor of the receiver

> The quality of the antenna being used, and whether they're Omni-directional, or highly directional

> the test environment (out doors on a clear day with direct line of site from both Bluetooth devices and relatively high off the ground, or in an apartment

building with several feet of concrete and steel between devices, as well as interference from Wi-Fi).

> The version of the Bluetooth standard that you're using. Bluetooth 5 offers a mode of operation that can increase the overall link range. All of these parameters impact the link range of the Bluetooth connection, making it very challenging to estimate the maximum distance over which you can use Bluetooth.

II. ABOUT BATTERY BACKUP

PIC Microcontroller projects are clock projects. All of my clocks are powered by 5V DC wall wart adaptors. In case of power failure, the clocks stop and I have to set time when the electric power is restored. This problem will not happen with the clocks using DS1307 RTC as it provides battery backup capability. However, the clocks without DS1307 or any other RTCs will suffer from power failure. The circuit below is an example of the use of battery backup circuit with PIC16F627A or PIC16F628. The circuit can be used with other Microcontroller chips as a battery backup source. It also provide power failure signal (active low) for further processing.

6. CONCLUSION

As a pocket portal to the Finnish caves, this self-help mobile guide app is rather simple in the framework and easy to use. It shall meet the needs of caves information outreach and mobile interpretation. An outsourced centralized management center to develop, operate. A complete evaluation of the app effectiveness and a detailed mobile visitor studies will follow the deployment to identify and adjust to caves further needs.

ACKNOWLEDGEMENT

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