

Voice Operated Smart Notice Board Display Using Android

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Abstract – The paper brings in a smart android based notice board display system that enables users to display the messages to be conveyed without typing or writing it. In this the conveyor says after pressing the dedicated soft key through an android smartphone which employs a developed speech to text phone application. The text message is then transferred via Ethernet stacked with Arduino using Wi-Fi Dongle working as repeater and is then displayed on the LCD screen. This project also enables longer connectivity that is over Wi-Fi compared to Bluetooth which are currently used for wireless display. This saves time, labor and its charges, most importantly paper hence eco-friendly and it can be achieved over long distance.

Index Terms – Notice board, Speech recognition, Ethernet, LCD.

1. INTRODUCTION

In the contemporary world of overwhelming connection, we are so focused on the ease of accessing information. By the virtue of the internet or newspapers, we love keeping ourselves updated and informed.

Notice boards are the primary thing in any institutions or public utility places like bus stations, railway stations, colleges, malls etc. Now a days, papers or wired notice board displays serves for the purpose. A specific person is assigned the task for pasting the notice. This not only calls in for extra labour charges as well as consumes a whole lot of time. In the current era where ease of access has always been at the top place in the catalogue of development, need to deliver the message faster is very crucial.

This project enables us to communicate without even having someone's contact details or neither needed to have any account with the system hence is better than any online services available till date. The range it provides is its biggest capability. With routers as repeaters it can service an entire organization located at one place. With further more work removing the complexity 'n' no. of classrooms can be delivered with the separate messages to be displayed by having all the tabs representing the classes in only one app. Hence this paper is based on an ingenious rather an exhilarating manner of directing messages to the peers or common folks by employing a wireless electronic display board which is synchronized using an android app.

2. RELATED WORK

This system has a transmitter and a receiver section. The transmitter section consists of the android phone with the app through which the conveyor says through our self-developed open source speech to text application for android. For easy transfer of the message Ethernet shield stacked with the Arduino-Uno is installed at the receiver side. The Ethernet shield does the internet connection with excellent ease. This set up is empowered with Wi-Fi router working as a repeater and is connected to an internet source. A speech to text application is employed for the conversion of the said data speech to the message to be displayed. The converted message is then transferred to the receiver section via Arduino-Uno. The whole setup continuously checks if there was any message, it opens the message and saves it in the memory until the command for reception of next message is given using the soft key in app. The display is programmed in such a way that it appears like a blank screen (Kiosk mode) and displays the notifications when they arrive. The text message currently can be displayed until next data reception request. Updating of the new information will be as soon as the arrival of a new message

Hardware requirement

SL. NO	COMPONENTS NAME	Nos.
1.	Ethernet Shield	3
2	Android phone	1
3	Wi-Fi Dongle	1
4	Arduino Uno	3
5	Power supply	1
6	LCD Display	3

Table 1: Components List

2.1 Ethernet shield

This allows you to easily connect your Arduino to the internet and enables it to send and receive data from anywhere in the world in mere minutes. Easy plug-in is possible with the Arduino. Anything can be controlled remotely over internet via

Ethernet shield. An on-board Wiz5100 Ethernet controller handles up to four TCP and UDP connection. Just stack it onto an Arduino to create your own networked devices. We can easily check connection status with on board indicator lights.

- ☐ Stacked with Arduino
- ☐ Connected to internet With RJ45 cable
- ☐ Network created with its specific IP address.

2.2 ANDROID PHONE

Android is a mobile operating system developed by Google, based on a modified version of the Linux kernel and other open source software.

- ☐ App developed for this at android studio.
- ☐ Message to be conveyed said aloud.
- ☐ Data will be received based on machine learning.
- ☐ Transmitted to LCD over internet via Arduino.
- ☐ Displays the most accurate result.

2.3 ARDUINO

It is a microcontroller board, with this every element of the platform: hardware, software and documentation is freely available open-source. This is based on the ATmega328P (datasheet), has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. The 16MHz crystal oscillator that generates low frequency and phase jitter, which is recommended for USB operation.

2.4 WI-FI DONGLE

A Wi-Fi ensures enhanced and long ranged connectivity, while accessing of shared files gets lot easier. It works as a repeater here in this project. This is how we are able to enhance the range to even longer distance thorough we can cover the entire college.

BOOTING ROUTER TO MAKE IT A REPEATER [4]

- ☐ Logging in the router IP
- ☐ Going to advanced wireless settings
- ☐ Setting it to repeater
- ☐ This enhances the range

2.5 POWER SUPPLY

The power supply is of 12V DC. The router is powered by 220V AC supply. USB's coming Arduino goes and is powered

through a laptop through which the program for the Ethernet shields in use are uploaded.

2.6 LCD DISPLAY

A flat-panel display that manipulates the light-modulating properties of liquid crystals. Emitting of light is not direct in this, uses a backlight/reflector for colored or monochrome image production. LCDs are to display with low information content, such as preset words, digits, and 7-segment displays. They has the same base technology, other than arbitrary images composed of large number of small pixels, while other displays have larger elements.

LCDs consume much less power than LED and gas-display displays because they work on the principle of blocking light rather than emitting it. An LCD is made with either a passive matrix or an active matrix display grid. The active matrix LCD is also known as a thin film transistor (TFT) display. The passive matrix LCD has a grid of conductors with pixels located at each intersection in the grid. A current is sent across two conductors on the grid to control the light for any pixel. An active matrix has a transistor located at each pixel intersection, requiring less current to control the luminance of a pixel. For this reason, the current in an active matrix display can be switched on and off more frequently, improving the screen refresh time (your mouse will appear to move more smoothly across the screen, for example).

3. PORPOSED MODELLING

A Communication system has two basic sections.

1. Transmitter
2. Receiver

A transmitter is an equipment, which converts a physical message into an electrical message. A receiver on the other hand is an equipment which converts the electrical signal back to the physical signal. The electrical signal from the transmitter is conveyed to the receiver through a particular channel, either it could be a wired communication or wireless mode of communication channel. As our project is based on an android application, we are using Wi-Fi module, a wireless mode of communication

While the user sends the message from the mobile, the remote operation is achieved by any smart-phone/Tablet etc., with Android OS, upon a GUI (Graphical User Interface) based voice operation. Transmitting end uses an Android application device remote through which commands are transmitted. At the receiver end, these commands are converted to texts used which are displayed on a 20X4 LCD - interfaced to the Arduino. Serial communication data sent from the Android application is received by a Wi-Fi receiver interfaced to the Arduino. The program on the Arduino refers to the serial data to display the received data on a 20X4 LCD.

The transmitter part of our project is an Android application named as “Class 1, 2 or 3” depending upon the class selected for message display. The coding for the application part was done on an online application inventor named as Android studio. This application consists of two portions, the first is the voice recognition and the second one is the soft keys. That simply means this application can work on the basis of voice recognition after getting started manually. When the user wants to send a message to be displayed it's just a matter of time, there's no need to write and post anything as well as type anything. You just have to connect your device to the Wi-Fi and only by tapping the app icon and saying what you want to be displayed.

The receiver module placed at the remote end also has Wi-Fi connectivity to micro-controller with display device. Here Ethernet is connected to the Internet using Wi-Fi router. The connectivity is smart here cause for each Ethernet connected to internet has different IP addresses. The converted text message sent from smart phone has to be displayed on display connected to the Arduino terminal. Arduino-Ethernet with display will be installed in the class rooms of college campus.

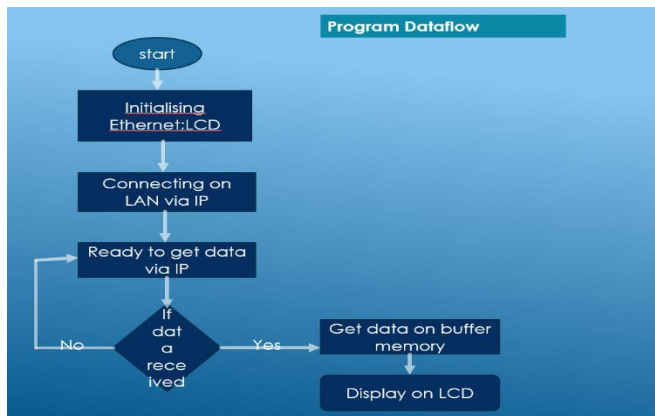


Figure 2 Flowchart of the program

4. RESULTS AND DISCUSSIONS

As the project is divided into two parts, Transmitter Module and Receiver Module. Transmitter Module containing Wi-Fi and android application. As we are so familiar with smartphones nowadays. Thus controlling an android app is easy. Android app is linked with Wi-Fi with the phone. In the starting we have to set the Wi-Fi router in the repeater mode. Then the router with site surveying will get the internet connectivity as well as will distribute the same. The device having the app is just needed to be connected with this router. Once the Wi-Fi devices are paired and connected the android app is connected with the transmitter circuit. Now we can give command by using soft keys and voice command.

Google Voice Speech has been used here for the speech recognition but specifically to deliver the message to a specific

LCD. This will require internet connection. When a message to be delivered is spoke in the app, it goes with the best possibility for the words uttered and further learns and improves over time based on the user's accent called as machine learning.

The Receiver Module consists of the Wi-Fi receiver, LCD screen and ATmega328P microcontroller. Whatever command given from the app will be displayed on the LCD screen. All of the command that will initiate the execution procedure is already feed in microcontroller. Whenever we say something by employing Google machine learning it receives our voice and displays the message by speech to text conversion on to the LCD. With time the Google machine learning the results tend to get better.

5. CONCLUSION

In designing of this project we came to know that there is number of ways to operate our appliance in a safer manner. Android phone is not only capable of doing regular task but also with proper interfacing and application design it can operate. With the utter need to serve and deliver message faster without having any accounts of the user or customer or students with enhanced connectivity over longer distance gives it an edge. Machine learning does the remedial part over time and improves the accuracy multiple times.



Figure 2 notice boards displaying the messages

REFERENCES

- [1] G. N. Jagan Mohan Reddy, G.Venkareshwarlu; WIRELESS ELECTRONIC DISPLAY BOARD USING GSM TECHNOLOGY, International Journal of Electrical, Electronics and Data Communication (IJEEDC), ISSN: 2320-2084 Volume-1, Issue-10, Dec-2013.
- [2] Mr. Ramchandra K. Gurav, Mr. Rohit Jagtap; Wireless Digital Notice Board Using GSM Technology, International Research Journal of Engineering and Technology (IRJET) Volume: 02 Issue: 09 | Dec-2015.
- [3] Prof. R. G. Gupta, Nawale Shubhangi, Tupe Usha Waghmare Priyanka. Android based E-notice board. International Journal of Advance Research and Innovative Ideas in Education (IJARIIE). 2016; 2(2)
- [4] A. Meenachi, S. Kowsalya, P. Prem Kumar. Wireless E-Notice board using Wi-Fi and Bluetooth technology. Journal of Network Communications and Emerging Technologies (JNCET). 2016; 6(4).

- [5] Abhishek Gupta, Rani Borkar, Samita Gawas, Sarang Joshi. GSM based wireless notice board. International Journal of Technical Research and Applications. 2016; 30–33p.

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