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REPORT on
MINI-PROJECT [18ECMP68]
"Voice Based Notice Board Using Android"

Submitted in partial fulfillment of the requirements for the award of the degree

**BACHELOR OF ENGINEERING
IN
ELECTRONICS AND COMMUNICATION ENGINEERING**

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CERTIFICATE

Certified that the mini project work "**Voice Based Notice Board Using Android**" is a bonafide work that is carried out by, SATYAM(1MV20EC102), SHANTANU SINGH(1MV20EC105), SHWETA KUMARI(1MV20EC110), YOGESH KUMAR(1MV20EC125) students of SIR M VISVESVARAYA INSTITUTE OF TECHNOLOGY in partial fulfillment of the requirements for the Degree of Bachelor of Engineering in Electronics and Communication Engineering of Visvesvaraya Technological University, Belgavi for the academic year 2022-2023. It is certified that the all the correction and the suggestion indicated by the Internal assessment have been incorporated in the report deposited in the departmental library.

The project report has been approved as it satisfies the academic requirements in respect of the project work prescribed for the course of Bachelor of Engineering.

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1…………………..   ………………..

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DECLARATION

We here by declare that entire project work embodied in this dissertation has been carried out by us and no part has been submitted for any degree or diploma of any institution previously.

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ABSTRACT

The Voice-Based Notice Board Using Android project aims to create an interactive and convenient communication system for displaying and managing notices using voice commands. Traditional notice boards often face challenges such as limited space, difficulty in updating information, and time-consuming manual processes. This project leverages Android technology and voice recognition capabilities to overcome these limitations and provide a more efficient and user-friendly solution.

The system consists of two main components: a mobile application running on an Android device and a display board connected to it. The mobile application acts as a control center, allowing authorized users to create, update, and delete notices using voice commands. The voice recognition feature enhances accessibility and ease of use, enabling users to interact with the system hands-free.

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CHAPTER 1 :

INTRODUCTION

A voice-based notice board using Android is a project that allows users to post and listen to notices via a mobile application. The system utilizes voice recognition and synthesis technology to enable users to interact with the system using their voice.

The main objective of this project is to develop an Android application that can provide a convenient way for users to access and post notices in a public space, such as a school, workplace, or community center. With the use of voice commands, users can access the notice board and listen to posted notices, without the need for reading or writing.

The project involves the use of various technologies, including Android app development, voice recognition and synthesis, database management, and networking. The application will allow authorized users to post notices via voice commands, which can be easily accessed by other users.

Overall, the voice-based notice board using Android project provides a user-friendly and accessible way for people to share information and stay updated on important announcements in public places, their community or workplace.

1.1 Historical Background

The historical background of the Voice-Based Notice Board Using Android project can be traced back to the advancements in communication technology, the increasing popularity of Android devices, and the need for efficient notice management systems.

1.2 Advancements in Microwave Technologies

Over the years, communication technology has witnessed significant advancements. With the rise of the internet, smartphones, and wireless connectivity, information dissemination has become faster and more accessible. This has led to the exploration of innovative solutions for managing and delivering information in various contexts.

1.3 Emergence of Android Platform:

The Android operating system, developed by Google, gained widespread popularity in the late 2000s. Android devices, such as smartphones and tablets, became widely adopted due to their affordability, versatility, and user-friendly interface. Android's open-source nature also encouraged developers to create innovative applications for various purposes.

1.4 Limitations of Traditional Notice Boards:

Traditional notice boards, often found in educational institutions, offices, and public spaces, have several limitations. They are typically static, requiring manual posting and updating of notices. This process is time-consuming, prone to errors, and can result in outdated information. Additionally, physical notice boards have limited space, making it challenging to accommodate a large number of notices.

1.5 .Challenges and Considerations

The Voice-Based Notice Board Using Android project involves several challenges and considerations that need to be addressed for its successful implementation. Here are some key challenges and considerations associated with the project:

One of the primary challenges is ensuring accurate and reliable voice recognition. The system must be capable of accurately interpreting and understanding various accents, speech patterns, and languages. Robust algorithms and continuous improvement of the voice recognition model are essential to minimize errors and improve user experience.

Since the notice board may contain sensitive or confidential information, implementing secure user authentication mechanisms is crucial. User roles, access control, and encryption techniques should be implemented to prevent unauthorized access and ensure data privacy.

The project requires seamless connectivity between the Android device and the display board. Compatibility issues, such as different screen resolutions, aspect ratios, and connection protocols, need to be considered and addressed to ensure a smooth integration and display of notices.

CHAPTER 2 :

LITERATURE SURVEY

Swathi S.,Praveen Kumar P.,"**Smart Info-Board System Based On Voice Recognition**", *2020 International Conference on System, Computation, Automation and Networking (ICSCAN)*, 03, 04 July 2020, NSPEC Accession Number: 20210395

https://ieeexplore.ieee.org/document/9262354/authors#authors

Summary: Info-board is a fundamental military activity framework in way of life. Regular anticipated paper notice framework is long and not proper for quick sharing of information. We as a whole realize that the information tallies are unending. In this manner there's a use of huge amount of paper for showing those unlimited tallies of information. To beat challenges, quite a while ago looked by wood and conventional sort notice board, web may be utilized as a vehicle of moving data. During this arranged framework, web of Things(IOT) innovation is utilized that delivers the strategy prudent conjointly data in any type may be shown that's, content, pdf, pictures, word, and so forth., on the information board. PC is utilized for causing data and Raspberry pi is associated with web on the getting feature. A product is kept up to post the substance and this should be possible from anyplace utilizing web. This shrewd info- board will likewise show the data by simply questioning its document name through the voice of the approved individual

Md. Eftekhar Alam, Shamima Akter Proma, Sanchita Sharm "**Development of a Voice and SMS Controlled Dot Matrix Display Based Smart Noticing System With RF Transceiver and GSM Modem.**" *International Research Journal of Engineering and Technology (IRJET)*, 23 April, 2019

Summary: The noticeboard is a primary thing in any institution or organization to disperse information among the stakeholders. In the busy and fast moving world today, conventional sticking paper notice system is time-consuming and not suitable for quick sharing of information. This paper represents a smart electronic remote noticing system where an authorized accountable person can share information in the notice board anytime from his office room or any places in the world having the cellular network. In the proposed system, notice can be sent in two ways. The user can update notice from his office room either by voice or text message via a smartphone using Bluetooth and RF communication within 1-kilometer distance. In this way, the user sent notice using his own local wireless network and should not pay money to any operator. Another way to update notice by sending SMS using mobile network when the user stays outside of his office room. In this way, the user has to pay SMS charge to the mobile operator. The notices sent by the user are scrolled in a 32X8 LED matrix display. The system can show current notice with two previous notices. It also gives a notification by a buzzer when a new notice is received. This smart notice board can make noticing system of an organization much simple, fast and cost-effective

Rajesh G.P et. al., "**Near field application: NFC smart notice board**", *Thirteenth International Conference on Wireless and Optical Communications Networks (WOCN)*, 21-23 July 2016, Hyderabad, India.

Summary: —One of the conventional ways of dispersing information in a university or corporate office is through the Notice Board. Notice boards are an ideal platform that allows one to put up information so that it can be seen by everyone. Whenever there is a new circular to be dispersed among the students or employees, it will be immediately put up on the notice board where everyone has to manually gather at the board and look into the notice. In the busy and fast moving world today, this will lead to wastage of time. Instead, this paper provides a solution to the above problem using NFC application. The idea that has been proposed in this paper is to display the notice board through NFC tags. Each NFC tag is programmed to contain the notice information to display. Whenever it is required for a circular to be displayed just program (Update the Notice) the NFC tag. The students, employees etc., can scan the NFC tag through their NFC enabled smart phones which downloads the notice in the document format online into their handheld devices. This solution is user-friendly as the end-user can read the notices at their own convenient time in turn leads no wastage of time.

Sayidul Morsalin et. al., "**Password protected multiuser wireless electronic noticing system by GSM with robust algorithm***", 2nd International Conference on Electrical Information and Communication Technologies (EICT)*, 10-12 Dec. 2015, Khulna, Bangladesh.

Summary: This paper elucidates a wireless digital noticing system to provide information in an innovative and smart way. The proposed notice board is a multiuser password-protected SMSbased system fabricated with an LCD. The communication and information transfer between the authentic user and the LCD display unit is done via GSM to ensure remote display facilities, so any notice can be displayed on the electronic board from the user's mobile SMS from distant

places. To ensure system flexibility, a multiuser noticing and displaying system has been implemented in the system which can display several notices simultaneously. In addition, the user also can print any notice which is of concern to them. The total system is designed with simple logic with a robust algorithm and fabricated with a PIC midrange microcontroller, LCD, GSM module and other commercially available electronic devices to ensure efficiency and reliability with less cost.

CHAPTER 3 :

PROBLEM STATEMENT

The problem statement of the voice-based notice board using Android project is to provide a convenient and efficient way for people to access and post notices in public spaces. The traditional notice board system involves physical posting and reading of notices, which can be time-consuming and inconvenient.

Moreover, the traditional notice board system requires users to have basic literacy skills to read and understand the notices. This can be a challenge for people with visual impairments, language barriers, or limited literacy skills.

In addition, with the COVID-19 pandemic, there is a growing need for contactless communication and information sharing. Physical notice boards may increase the risk of virus transmission as they involve touching and handling the same surfaces by multiple people.

Therefore, the voice-based notice board using Android project aims to address these challenges by providing a digital platform that allows users to interact with the notice board using voice commands. The system will enable users to listen to posted notices without the need for reading or writing, which can be beneficial for people with different abilities and literacy levels.

Overall, the project aims to improve the accessibility, ease in disseminating the critical information to the needy, efficiency, and safety of the notice board system by leveraging technology to facilitate communication and information sharing in public spaces their community or workplace.

CHAPTER 4 :

OBJECTIVES

The objective of the Voice-Based Notice Board project is to create a communication system that allows for the efficient management and dissemination of notices using voice commands. The primary objectives of the project include:

1. Convenience and Accessibility: The project aims to provide a user-friendly and accessible platform for notice management. By leveraging voice recognition technology, users can interact with the notice board using their voices, eliminating the need for manual input and allowing for hands-free operation.

2. Real-time Updates: The system aims to ensure real-time updates and synchronization between the mobile application and the display board. Any changes made to the notices through voice commands should be immediately reflected on the display board, providing up-to-date information to the users.

3. Streamlined Notice Management: The project intends to simplify the notice management process. Authorized users should be able to create, update, and delete notices using voice commands, eliminating the need for manual posting or physical interaction with the notice board.

4. Security and Authentication: The project aims to implement secure user authentication mechanisms to ensure that only authorized individuals can modify notices. This objective ensures data privacy and prevents unauthorized access to the notice board.

5. Integration and Compatibility: The system aims to seamlessly integrate with Android devices and compatible display boards. It should accommodate different screen resolutions, aspect ratios, and connection protocols to ensure a smooth integration and display of notices.

6. Usability and User Experience: The project aims to provide an intuitive and user-friendly interface for interacting with the notice board. The voice commands should be well-defined and easily understood by users, ensuring a positive and efficient user experience.

7. Scalability and Performance: The system should be designed to handle a large number of notices and users without compromising performance. It should be scalable to accommodate the growing needs of organizations or institutions using the notice board.

8. Enhanced Information Dissemination: The project seeks to improve the efficiency and effectiveness of information dissemination. By providing a dynamic and interactive platform, it enables timely and targeted communication, ensuring that users receive important notices promptly.

By achieving these objectives, the Voice-Based Notice Board project aims to address the limitations of traditional notice boards, streamline notice management processes, and enhance communication in various settings, such as educational institutions, corporate offices, and community centers.

CHAPTER 5 :

METHODOLOGY

The proposed methodology for the voice-based notice board using Android project can include the following steps:

1.Input: user will speak into the android device the respective message.

2.Voice to Text: The voice input converted into text through android application. Which is send to Esp32 microcontroller via Bluetooth device.

3.Microcontroller: Microcontroller receive the command from the android application and controlling the display of message on LCD

4.LCD(Liquid Crystal Display): Received message text is displayed On the LCD screen.

BLOCK DIAGRAM
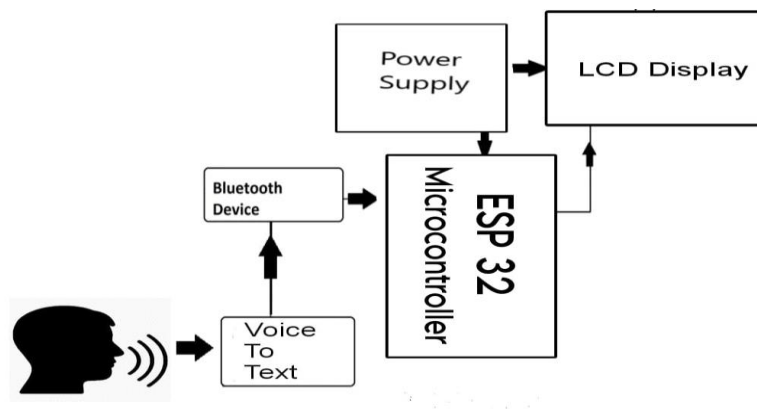
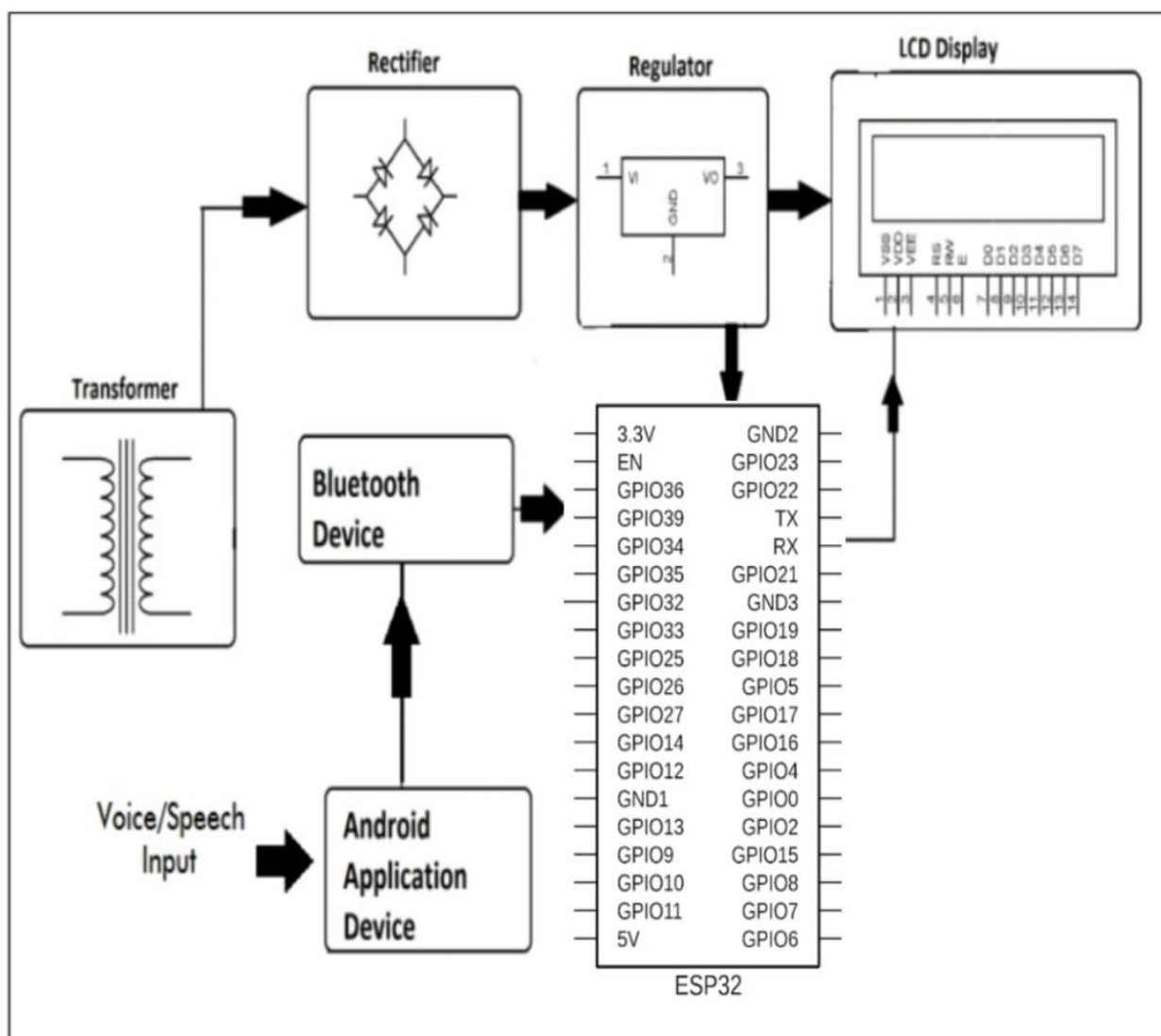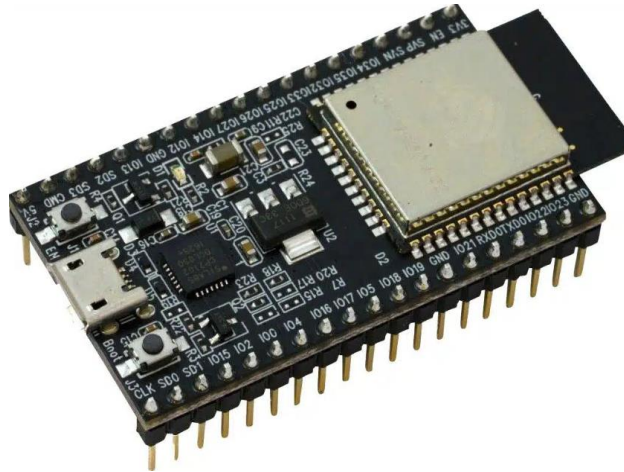Fig : 5.1 : Block diagram of the Proposed System

CIRCUIT DIAGRAM

Fig : 5.2 : Circuit diagram of the Proposed System

CHAPTER 6:

HARDWARE DETAILS

- Esp32 (microcontroller)

The ESP32 is a popular and versatile microcontroller and Wi-Fi module developed by Espressif Systems. It is widely used in the field of Internet of Things (IoT) and embedded systems. Here's a short note on the ESP32:

The ESP32 is based on the Xtensa LX6 processor and features dual-core processing, which allows for multitasking and efficient handling of complex tasks. It operates at a clock speed of up to 240 MHz.

One of the key features of the ESP32 is its built-in Wi-Fi and Bluetooth capabilities, which make it easy to connect and communicate with other devices and networks. It supports various Wi-Fi modes, such as station, access point, and simultaneous access point/station mode.

In addition to Wi-Fi and Bluetooth, the ESP32 provides a wide range of peripheral interfaces, including UART, SPI, I2C, I2S, ADC, and more, making it highly adaptable to different project requirements.

The ESP32 also offers a rich set of software development tools and libraries, allowing developers to program it using various programming languages, such as C/C++ and Micro Python. It has a flexible and extensible ecosystem that supports development frameworks like Arduino and ESP-IDF (Express if IoT Development Framework).

With its low power consumption and efficient performance, the ESP32 is suitable for a wide range of applications, including home automation, industrial automation, wearables, smart agriculture, and many others.

Overall, the ESP32 is a powerful and feature-rich microcontroller module that combines processing power, connectivity options, and a vast array of peripheral interfaces, making it a popular choice for IoT projects and embedded systems development.

- HC05 bluetooth
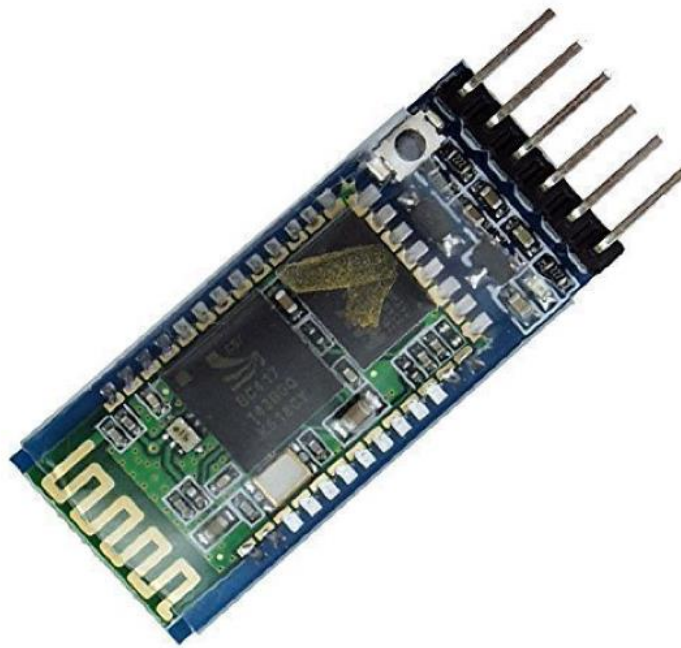
The HC-05 is a commonly used Bluetooth module that allows wireless communication between devices. Here's a short note on the HC-05 Bluetooth module:

The HC-05 is a Bluetooth 2.0 module that supports the Serial Port Profile (SPP), making it easy to establish a serial communication link between devices. It operates in the 2.4GHz frequency range and has a typical range of around 10 meters.

- **16x2 LCD Display**

16x2 LCD (Liquid Crystal Display) refers to a commonly used type of alphanumeric display module. It consists of 16 columns and 2 rows, allowing it to display up to 32 characters at a time. Here's some information about the 16x2 LCD:A

I2C Driver Serial Interface
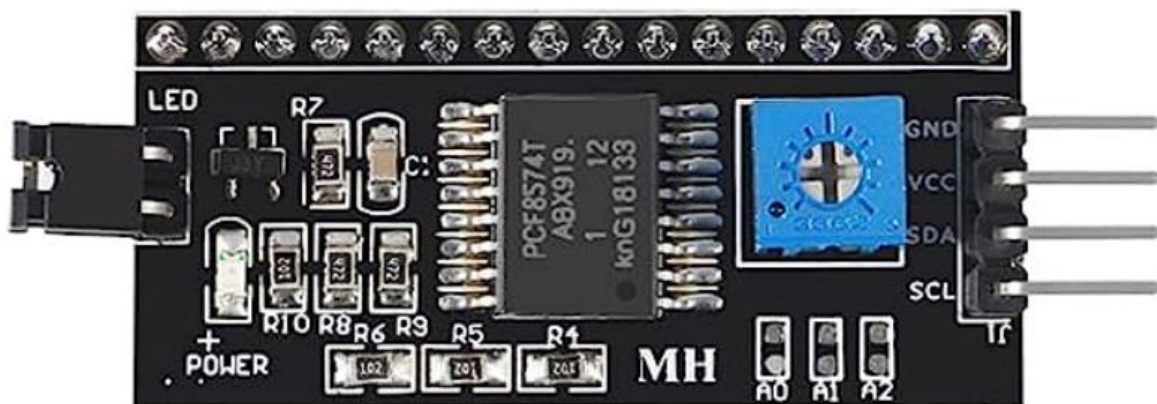
An I2C (Inter-Integrated Circuit) driver is a software component that enables communication between devices using the I2C protocol. The I2C protocol is a widely used serial communication protocol that allows multiple devices to communicate with each other using a shared bus. Here are some key points about an I2C driver.

CHAPTER 7:

SOFTWARE DETAILS

Arduino IDE

The Arduino IDE (Integrated Development Environment) is a software platform specifically designed for programming Arduino boards. It provides an intuitive and user-friendly interface for writing, compiling, and uploading code to Arduino microcontrollers. Here are some key points about the Arduino IDE

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Programing Language : Embedded C

CODE USED:

```
#include <LiquidCrystal_I2C.h>

LiquidCrystal_I2C lcd(0x27,16,2);

String datain;

void setup() {

  // put your setup code here, to run once:

Serial.begin(9600);

  lcd.init();

  lcd.backlight();
```

```
    }

  void loop() {

   if(Serial.available())

   {

    while(Serial.available() > 0)

    {

     char c = Serial.read();

     datain +=c;

     delay(10);

     }

     lcd.clear();

     lcd.setCursor(0,0);

     lcd.print(datain);

     Serial.println(datain);

    datain="";

   }

  }
```

CHAPTER 8:

RESULTS AND OUTCOME

All the objectives that were set in implementing the project were achieved. Project is implemented and the results are verified and are satisfactory.
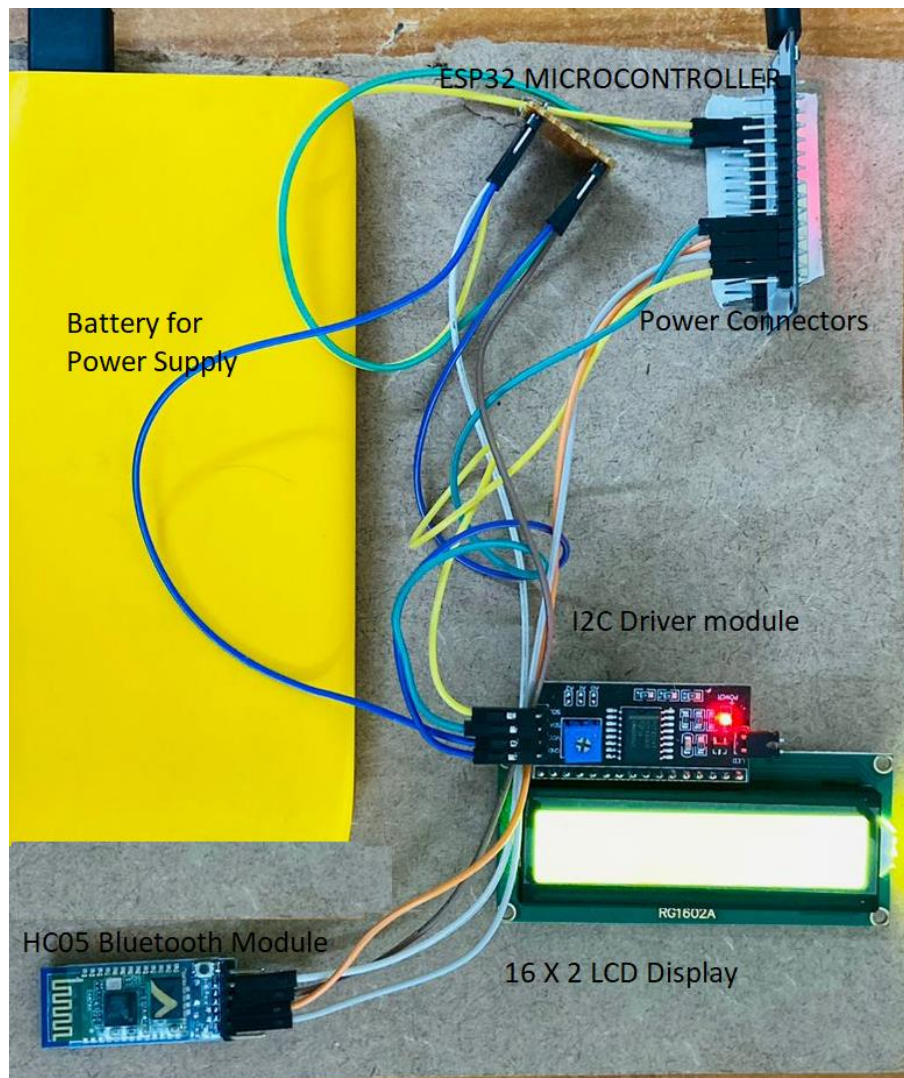

Fig 6.1 : Final Implementation of the Project

Fig 6.2 : Andriod Device Aap to convert Voice to Text

Convenience: Users can access the information on the notice board without having to physically be present in front of it. They can listen to the announcements or notifications from anywhere using their Android device.

Time-saving: Users can save time by avoiding the need to read lengthy notices or announcements. Instead, they can listen to the information while performing other tasks.

Real-time updates: The notice board can be updated in real-time, ensuring that users receive the latest information.

User-friendly: The Android-based interface can be intuitive and easy to use, making it accessible to a wider range of usersrange. It could assess the system's ability to mitigate interference and ensure coexistence with other wireless technologies.

CHAPTER 9 :

MERITS

1. Accessibility and Inclusivity: A voice-to-text converter notice board makes information accessible to individuals with hearing impairments. By converting spoken words into written text, it ensures that everyone can receive important messages and updates, promoting inclusivity and equal access to information.

2. Accuracy and Clarity: Voice-to-text converters employ advanced speech recognition technologies that can accurately convert spoken words into written text. This helps eliminate potential errors or misunderstandings that can occur in manual transcription.

3. Recordkeeping and Reference: The written text produced by a voice-to-text converter can be stored and referenced later. This enables individuals to review important information at their convenience, reducing the reliance on memory or the need for repeated announcements.

4. Searchable and Indexable Information: Written text generated by voice-to-text converters can be easily indexed and searched. This allows users to quickly find specific information within a notice board, making it convenient to locate relevant notices or announcements.

5. Cost and Time Efficiency: Eliminate the need for manual transcription, which can be time-consuming and costly. The conversion process is automated, resulting in faster and more efficient dissemination of information.

DEMERITS

1. Accuracy Limitations: Although voice-to-text technology has improved significantly, it may still encounter challenges in accurately transcribing spoken words. Factors such as accents, background noise, and speech patterns can impact the accuracy of the conversion, leading to errors or misunderstandings in the written text.

2. Contextual Understanding: Voice-to-text converters may struggle to capture the complete context and nuances of spoken words. Certain elements like tone, emphasis, or non-verbal cues are lost in the conversion process, which could potentially impact the interpretation and understanding of the message.

3. Linguistic Challenges: Languages with complex grammar, homophones, or regional dialects may pose difficulties for voice-to-text converters. They may struggle to accurately differentiate between similar-sounding words or phrases, resulting in incorrect or confusing transcriptions.

4. Editing and Proofreading Requirements: The written text produced by a voice-to-text converter may require editing and proofreading to correct any errors or inaccuracies. This adds an additional step to the process and may necessitate human intervention to ensure the text's accuracy before dissemination.

5. Dependency on Technology: Voice-to-text converter notice boards rely on technology infrastructure and software. Any technical issues, such as system failures or software glitches, may disrupt or prevent the conversion process, impacting the timely delivery of information.

CHAPTER 10 :

CONCLUSION

In conclusion, a voice-based notice board offers numerous advantages and benefits in terms of accessibility, multilingual support, engagement, real-time updates, and eco-friendliness. It enables individuals with visual impairments to access information, caters to diverse language needs, captivates the audience through voice announcements, delivers current and relevant updates, reduces paper usage, and offers scalability and flexibility. The personal touch and inclusivity provided by voice-based communication enhance the overall user experience. However, it is important to consider potential limitations such as accuracy challenges, contextual understanding, and the need for editing. The decision to implement a voice-based notice board should be based on an assessment of its suitability for the specific context and the trade-offs between its merits and demerits. Ultimately, a voice-based notice board can greatly enhance communication, accessibility, and engagement, making it a valuable tool for information dissemination in various settings.

FUTURE SCOPE

The future scope of voice-based notice boards is promising, with several potential advancements and developments on the horizon. Here are some aspects of future growth and possibilities:

1. Advanced Speech Recognition: With ongoing advancements in speech recognition technology, the accuracy of voice-to-text conversion is expected to improve further. Natural Language Processing (NLP) techniques can be employed to enhance contextual understanding, better capture nuances, and accurately transcribe spoken words into written text.

2. Natural Language Generation: Future voice-based notice boards may utilize Natural Language Generation (NLG) techniques to convert written text back into spoken words. This can enhance the interactive and engaging experience by generating human-like voices and allowing for dynamic voice announcements.

3. Artificial Intelligence Integration: Integration with artificial intelligence (AI) algorithms can enable voice-based notice boards to learn and adapt to individual preferences and communication styles. AI-powered systems can personalize announcements, optimize voice clarity, and better cater to the needs and preferences of the users.

4. Cloud-based Notice Boards: Cloud-based architectures can facilitate centralized management and distribution of voice-based notice boards. Administrators can remotely update and manage announcements, ensuring consistency across multiple locations and enabling real-time updates.

5. Interactive Features and Voice Commands: Future voice-based notice boards may incorporate interactive features and voice commands, allowing users to ask questions, provide feedback, or request specific information. This interactivity can enhance user engagement and provide a more personalized experience.

6. Integration with IoT and Sensors: Voice-based notice boards can be integrated with Internet of Things (IoT) devices and sensors to provide real-time information and notifications. For example, integrating with occupancy sensors can trigger announcements when people enter specific areas.

7. Integration with Data Analytics: By analyzing user interactions and engagement patterns, voice-based notice boards can generate valuable insights. Data analytics can help improve communication strategies, optimize content delivery, and tailor announcements based on user preferences and behavior.

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