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SMART INTELLIGENT REPORTING SYSTEM

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ABSTRACT

There is a huge market and need for e-governance apps in this digital age that incorporates smart city concepts. Nowadays, consumers research other people's opinions before making any kind of purchase, booking a hotel room, going to a restaurant, etc., and the particular user provides comments on the service based on their personal experience. However, there is no e-governance system in place to gather public complaints about new laws, regulations, etc. from the government. As opinion-rich information becomes more widely available, there may be new opportunities and problems in creating a technology to mine the vast amount of public opinion and notify the appropriate departments to take the necessary action. In current day to day life people face different challenges and they are unaware of which department is responsible and how to get communicated. Also, sometimes government negligence might take several lives.

Business intelligence (BI) has been introduced to smart city management through both deep learning and machine learning. Most of the application domains were energy management, healthcare management, finance management etc. for substantial needy growth and managing resources efficiently and effectively. In current trend managing energy utilization by private and public buildings were larger energy consumers and hence it was vital to predict energy usage effectively, the demand for Energy production now requires more raw materials than ever before. Earlier in the stage, typical systems would manually anticipate the energy consumption for the near future.

In Phase I we propose a smart device in each public area this allows members of the public to express their ideas, complaints, remarks, etc., in their native tongue. For the purpose of gathering public opinion, smart gadgets are stored in all public spaces.

In Phase 2 to overcome this challenge and provide an efficient we presented a natural language-based public opinion mining system for the e-governance platform to gather and the public opinions. The public voice-based complaint was converted into text using Hidden Markov Models (HMMs). To identify which government agency is in charge of the particular opinion, we employ pre-processing, part of speech, unigrams, bigrams, trigrams, and fuzzy logic (a machine learning approach). After selecting the responsible department, we employ the following two methods: 1.Automatically send departmental government officials an email alert. 2. A ticketing procedure.

Keywords*: Business intelligence (BI), deep learning (DL), and machine learning (ML), opinion mining, text mining, natural language processing (NLP), sentimental analysis.*

1. INTRODUCTION

In this modern age, social media users on the Internet produce enormous data, feedback and opinions. Processing these data and providing advice is a challenge. We look into text mining, opinion mining, and natural language processing (NLP), how researchers might notice and assess important information from the vast amounts of

data, comments, and views. Sentimental analysis may also be called opinion mining. The present world is data-driven where data determines the business; the above areas are the active research areas mentioned. The scope of text mining, opinion mining and NLP is vast and few applications are listed below namely product pricing, demand forecast, stock market forecast, political forecast, financial sector risk identification and analysis of e-commerce user comments.

The social media also picked up from the other side and became important for users to contribute their thoughts such as twitter, amazon, yelp, Trip Advisor, flipchart, etc. In recent years, the development of a user-friendly platform to attract users and business people, both academic and industrial people, has contributed several ideas on opinion mining. Sentimental research, data mining and data processing play a significant part in the development of smart cities. By the year 2025, 17 billion data on the emergence of a smart city must be handled and processed by a few research states. Sentiment analysis is nothing but the analysis and extraction of important user views, feelings, concerns, ratings, product evaluations, assets, programs, organizations, people, events, subjects, titles, and important details.

Many studies state that sentimental analysis is used to obtain positive, negative, neutral elements of user inputs. It is now attempting to extend to audio sources of video data that will have a greater effect in the future. A minimum of 26 global smart cities can be expected by 2025, according to study, where many cyber physical devices and smart devices will be incorporated wherein a huge collection of data will be collected and a smart tool would be required for processing. In order to simplify and render the user-friendly activity of community services, smart cities are nothing more than automating the manual process by digitalizing public processes such as traffic congestion, power and water use and public safety activities. In order to provide a healthy, vibrant climate, enhancing each citizen's quality of life is the main driver of smart cities.

2. METHODOLOGY

In the proposed system, a smart device in each public area which the general people can use to express their ideas, complaints, suggestions, etc., in their native tongue is offered. For the purpose of gathering public opinion, smart gadgets are stored in all public spaces. Three experimental outcome categories like Corporation, police, and hospital are taken into consideration in this work.

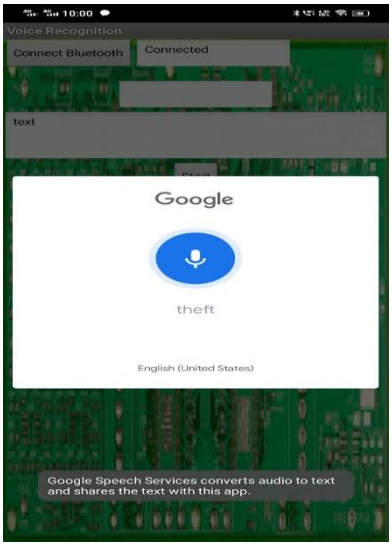

Fig.2.1. Voice Command

Giving in figure 2.1, the voice command to send the notification to the respective categories like police, corporation, and hospital. The NLP and opinion mining tools automatically assign each public opinion to the appropriate departments. An automatic email notice would be issued to each department's specific email address using web services. The email would contain the consensus along with important details like location, street, etc. It would be easier for government officials to take the right action if government departments were informed about common worries, problems, and favorable public attitudes. An automatic ticketing system is proposed and to make the required modifications, a new ticket ID is produced for it, in which the public opinion, or text, is provided on the precise appropriate departmental webpage.The public, higher-ranking government officials, ministries, and using this technique, governing organizations can keep track of the actions taken by the various government representatives. Once the required corrective steps have been taken, government staff can react to the appropriate ticket ID and close the ticket. In order to assess the performance of each department, a monthly report is prepared that includes information such as the total the quantity of issues raised, the quantity of issues settled, the quantity of concerns unresolved, etc.

2.1. Speech to Text conversion Speaker recognition ought to be sufficiently stable to understand speech in loud settings in diverse speech types. The language translation system must be compact and simple to translate a wide range of subjects. Synthesis of speech must be more normal and more expressive efficiency of expression. Both researchers – including researchers in speech recognition and natural language scientists – work in close partnership to achieve the S2ST method. The speech recognition system must consider speech-independent, constant, random conversational speech to be effective in the S2ST system. In 1986, state-of-the-art speech recognition technologies could only identify related vocabulary terms that rely on the speaker.

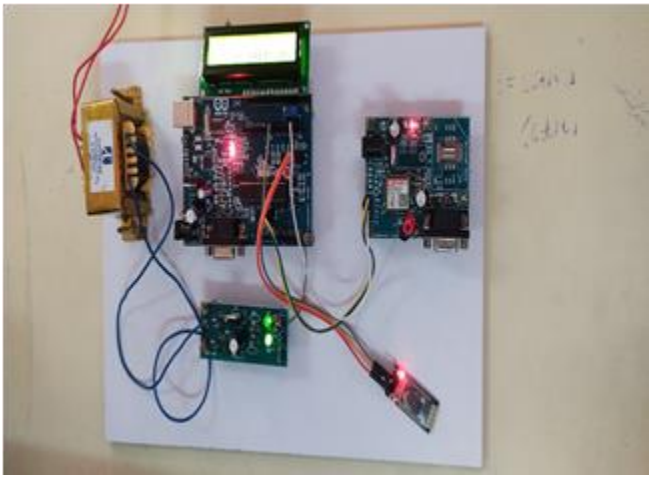

Fig.2.1. Architecture of the Smart intelligent reporting system

In figure 2.1 shows the overall system structure that has been suggested. Additionally, this would list the common problem that the general public encounters on a daily basis. Therefore, efforts are made to add various features to the public via region or area wise to conveniently meet their concerns. These statistics also reveal whether specific locations, regions, or streets require greater attention, saving the government resources and facilitating simple contact between the electorate and the elected officials.

3. RESULT AND DISCUSSION

3.1. Existing system

- GSM MODEM
- HC-05 wireless Bluetooth
- Arduino Using LCD1602
- Electronic spices Transformer
- Wireless power transfer -RX

3.1.1. GSM modem GSM modems, like cell phones, use SIM cards and require a mobile operator's subscription. Mobile operators see GSM modems as phones.

- By connecting a computer, The PC can connect to a mobile network by connecting to a GSM modem and using the GSM modem. Although many of these GSM modems also allow SMS and MMS messaging, connecting mobile devices to the internet is where they are most frequently utilized.
- The term "GSM modem" is used throughout this text to refer to any modem that supports at least one GSM evolutionary family protocol backwards. These include 3G networks like WCDMA, UMTS, HSDPA, and HSUPA as well as 2.5G technologies like GPRS and EDGE.
- Applications like Now SMS can take advantage of the modem interface provided by a GSM modem in order to send and receive text messages. The mobile provider will charge for these conversations just as if they had occurred on the actual handset. An "extended AT command set" is a requirement for a GSM modem to be compliant with the ETSI GSM 07.05 and 3GPP TS 27.005 specifications for SMS messaging.
- Since a GSM modem does not require a separate SMS service provider subscription, using one to send and receive SMS messages is a quick and simple method to get started with the service. Due to the fact that an SMS

message's sender is responsible for paying for its delivery, GSM modems are an affordable option in many regions of the world.

- The Falcom Samba 75 is a good example of a GSM modem that also serves as a 4205specialized modem device thanks to its serial, USB, and Bluetooth connections. (Wavecom, Multitask, and iTegno are a few other well-known companies that produce high-quality GSM modem hardware. On our technical help blog, we've also covered the topic of modem reviews.
- An alternative to a traditional GSM mobile phone that can connect to A GSM modem can be used with the right cable and software driver in a computer's serial port or USB port. Any mobile phone that supports the "extended AT command set" will be compatible with the Now SMS & MMS Gateway. The ETSI GSM 07.05 and/or 3GPP TS 27.005 specifications specify this command set. This modem interface might not work with all mobile phones.
- Due to compatibility issues, a specialized Using a GSM modem is frequently preferred over a GSM mobile phone. These issues are especially likely to arise when using MMS messaging. The majority of GSM phones' modem interfaces limit your ability to send MMS messages to only when you are actively utilizing the gateway and expecting to receive incoming MMS messages. This limitation results from the fact that the mobile phone automatically evaluates notifications of incoming MMS messages rather than passing MMS messages over the modem interface.
- It's important to keep in mind that not all phones support sending and receiving SMS messages over the modem interface. Most smartphones, Devices using Windows Mobile operating systems, Blackberries, and iPhones do not support this GSM modem interface for SMS transmission. A further difficulty is presented by the fact that Nokia phones using the S60 (Series 60) interface, which is based on the Symbian operating system, only support sending SMS messages through the modem interface and not receiving SMS messages over the modem interface.

3.1.2 HC-05 wireless Bluetooth The HC-05 serves as a serial to Bluetooth converter enabling the wireless communication between microcontrollers and other devices. In this article and in fig.3.1, we elucidate the functionality of this module, essential considerations for safe utilization in your projects, and delve into the fundamentals of its operation. The module has the capability to operate in both master and slave modes, making it versatile for diverse applications such as smart home systems, remote controls, data logging projects, robotics, monitoring systems, and numerous other use cases.

Fig 3.1.HC-05 Wireless Bluetooth

The module is conveniently available in the form of a pre-assembled breakout board (as well as without the breakout board), allowing easy integration with existing projects through a standard serial connection.

Numerous suppliers offer the module, and it can be obtained in different dimensions:

- Length: 28 mm (1 in), width: 15 mm (about 0.6 in), and height: 2.35 mm (0.1 in).
- It is typically priced around 8 dollars. The module operates within a supply voltage range of 3.3V to 6.0V, while the operating voltages for all pins, except VCC, are 3.3V.
- The working current consumption is approximately 30mA, and it provides a maximum operating range of 10 meters (33 feet).
- The default passcode for the module is either 0000 or 1234, depending on the specific model or manufacturer.
- It supports various baud rates for data transmission, including 9600, 19200, 38400, 57600, 115200, 230400, and 460800. Additionally, it adheres to the IEEE 802.15.1 standard for wireless communication.

3.1.2.1. Principle of Operation

The main purpose of the HC-05, as previously indicated is to add bi-directional (full-duplex) wireless capabilities to your projects. It makes it possible for two serial-capable microcontrollers, like two Arduino, to communicate with one another. Furthermore, it facilitates the control of Bluetooth devices using a microcontroller, or the control of a microcontroller by a Bluetooth device control over the HC-05 module is established through the TX and RX pins, and it offers compatibility with standard AT commands. To initiate this functionality, users need to activate a dedicated command mode during the module's power-up process. This can be achieved by setting the key pin to a low state while powering on the device. In the absence of this action, the module defaults to data mode, enabling wireless communication with other devices**.** Upon powering on the module, it becomes detectable by any Bluetooth device, such as a smartphone, allowing for a connection to be established using the default password. Once the connection is established, data is transmitted and converted into a serial stream by the HC-05 module. This serial stream is then received and processed by the microcontroller to which the module is connected. Conversely, when data is sent from the microcontroller, it follows the reverse path, with the HC-05 module transmitting the data as a serial stream via Bluetooth to the connected device.

3.1.3. Arduino Using LCD1602: The LCDs utilize a parallel interface, necessitating the microcontroller to simultaneously control multiple interface pins that control the display.

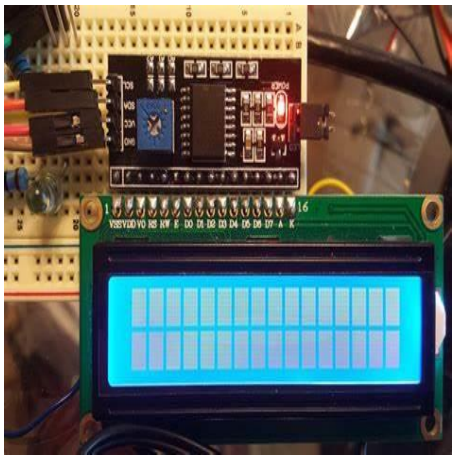

Fig 3.2 Arduino Using LCD1602

The following pins are included in the interface: a register select (RS) pin that chooses the intended place for data writing in the LCD's memory. It gives users the option of using either the data register, which retains the shown content, or the instruction register, which tells the LCD's controller what to do next as shown in fig.3.2. Read/Write (R/W) pin that chooses between reading and writing depending on the mode of operation. Data-writing enable pin that makes it possible to access the registers.8 data pins (D0 - D7) that carry the bits to be written into a register during writing or hold the values being read during reading. The state of each pin (high or low) corresponds to a specific bit value. Additionally, there are supplementary pins included in the interface:

- A display contrast pin (VO) allows adjustment of the contrast level on the display.
- Power supply pins (+5V and GND) provide the necessary electrical power for the LCD operation.
- LED Backlight (Bklt+ and Bklt-) pins control the activation and deactivation of the LED backlight, enabling the user to illuminate or darken the display as needed to govern the display, the procedure entails placing the data representing the desired image into the data registers, followed by inputting instructions into the instruction register.
- The Liquid Crystal Library streamlines this process, eliminating the requirement to familiarize oneself with the intricacies of low-level instructions.
- The Hitachi-compatible LCDs offer two modes of control: 4 and 8 bits. Seven Arduino I/O pins can be used to control the LCD in 4-bit mode, compared to 11 pins in 8-bit mode. The majority of operations can be completed in 4-bit mode for text display purposes. Therefore, the following example demonstrates how to control a 16x2 LCD specifically in 4-bit mode.

3.3.4. Electronic spices Transformer: Electronic components encompass various categories of electronic devices, including Resistors, Capacitors, Inductors, Semiconductor ICs, Relays, Potentiometers, Sensors, Buzzers, Speakers, Diodes, and more. Each electronic module circuit is constructed using one or multiple components, forming the fundamental building blocks of the circuitry as seen in the below figure 3.3.

Fig 3.3.Electronic spices Transformer

Our everyday experiences, we frequently encounter the significant role played by these components in our surroundings. We are constantly surrounded by a multitude of electronic devices, each comprising a diverse array of components, shaping the functionality and presence of these devices. An electronic component refers to any discrete device employed within an electronic system to manipulate electrons or their associated fields. These components form the fundamental building blocks of a circuit, contributing to its operation. They consist of various electrical circuits that can be interconnected with other circuits to generate a complete electronic circuit.

3.3.5. Wireless power transfer –RX Wireless power transfer (WPT), in its broad sense, has been prevalent in various applications for many years, including telemetry, satellite communications, and radio frequency identification (RFID) tags. These applications typically involve the transmission of low power levels, ranging from microwatts to mill watts, primarily for data transfer purposes. However, recent industrial advancements have focused on high-power WPT for applications requiring several watts to kilowatts of power over moderate distances. Inductive coupling, originally devised by Nikola Tesla over a century ago, remains the prevailing method for high-power WPT. The continuous progress in the semiconductor industry, specifically in high-frequency and high-power applications, has facilitated significant high-power inductive WPT advancements. Inductive WPT has many benefits over wired connections and is used in a variety of industries, including wearable electronics, healthcare, and the automobile sector. This chapter gives an overview of several WPT techniques before looking at and analyzing an inductive WPT design. The comprehensive study of inductive WPT is conducted systematically, considering each component and step in the process. For more detailed analysis and information, it is recommended to refer to the provided references. A method called wireless power transfer (WPT), commonly referred to as wireless charging, allows energy to be transmitted across a void without the use of physical cords or connections. By eliminating the necessity for ports and cables, this technology offers a more seamless and convenient way to recharge or power devices, reducing obtrusiveness. WPT techniques have found applications in various fields, including the recharging of smartphones and electric vehicles, with power transmission ranging from microwatts to several kilowatts. The use of common e-textile fabrication techniques, off-the-shelf components for power conversion circuits, and low sheet resistances in antenna films make it very simple to integrate WPT hardware in the context of e-textiles. The integration of a practical and flexible WPT system presents an appealing solution for enabling and powering functional e-textile electronics while preserving the textile's inherent properties.

3.2. Future Enhancement

3.2.1. Purpose

We may use the system that has been built to track a person's mobility in addition to the many tracking systems that have been established thus far to track automobiles and show their location on a map. Tracking someone's movements has now become a significant issue, whether it's a detective travelling to find a case or a criminal who just joined the payroll.

3.2.2. Scope

There are several purposes for the Global Positioning System. The first to employ it was the military. Boaters were the first persons to heavily rely on GPS for navigation because dead reckoning is prone to error. A marine GPS resembles GPS navigation systems seen in many high-end cars quite a bit. Some athletes use GPS gadgets to measure distance and speed. A few digital cameras have a GPS receiver that logs the position where the photo was taken. Up until now, I've only provided one-way applications. Two-way applications include mobile phones used to call the emergency number and vehicle tracking.

3.2.3. Objective

The United States Department of Defense manages GPS, often known as the global positioning system, is a radio navigation system. Initially created for military use, GPS is now accessible to everyone in the world, including those who are not in the armed forces. The National Executive Committee for Space-Based Positioning, Navigation, and Timing states that the goals of GPS are to continuously and freely offer precise positioning, navigation, and atomic timing services.

3.2.3. Components

The three essential components of GPS are space, control and users. The space segment consists of a constellation of American satellites that are positioned so that at least three of them can be seen from any location on Earth. According to PNT, there were 35 active GPS satellites as of October 2009. In the control segment, monitoring stations are dispersed across the world and keep an eye on the GPS system. The user segment is made up of GPS receivers.

3.2.4. Positioning GPS uses radio waves to give the user an exact location. The user receives a two-dimensional location of their latitudinal and longitudinal position on earth from the GPS receiver after translating the data from at least three GPS satellites. The receiver can give the user three-dimensional location data, which includes altitude in addition to latitude and longitude, if a fourth satellite is available.

3.2.5. GPS Tracking:

In order to determine the precise location of a person, car, or other asset to which it is affixed and to regularly record that asset's location, a GPS tracking unit uses the Global Positioning System (GPS). The tracking device can upload the recorded location data to a central location database or an internet-connected computer using a cellular (GPRS or SMS), radio, or satellite modem. As a result, GPS tracking software may assess the track afterwards and show the asset's location in real time against a map background.

3.2.6. Navigation

GPS works by using radio frequencies to pinpoint the user's location. After translating the information from at least three GPS a satellite, the GPS receiver displays a user's latitudinal and longitudinal position on earth in two dimensions. The receiver will be able to provide the user with three-dimensional position data that includes altitude in addition to latitude and longitude if a fourth satellite is reachable.

3.2.7. Timing

GPS is made to provide time, the fourth dimension, by synchronizing each GPS receiver with the GPS satellites to provide precise time to the user. The time is accurate to the closest hundred billionth of a second. This task can be carried out by GPS receivers since each GPS satellite has multiple atomic clocks.

4. CONCLUSION

In order to identify the pandemic situation of public attitudes, the suggested study is primarily focused on reviewing the analysis of public voice input. The suggested system uses a signal processing technique to quickly and securely identify pandemic situation from public voice input, and if necessary, it will notify a neighboring ambulance as well as the ministry of health. The official's perspectives on the common issues that the public faces are also ascertained by looking at the user feedback. Using these web and mobile platforms, the public can immediately voice their concerns to the relevant government representatives, and they can also follow the development of any solutions. Therefore, combining speech to text, NLP, opinion mining, and ticketing system operations provides government authorities with a clear picture of the particular locations, geographic areas, or streets that need more attention while conserving government resources. Because of this, the proposed method works well as an e-governance platform for the early detection of emergency cases during this pandemic and for opinion mining to highlight the need for change in the governmental sectors after this pandemic. The proposed system can be enhanced in the future to be able to recognize various diseases from user voice input signals and implement this e-governance application that integrates all governmental sectors, enhancing human quality of life and creating strong relationships between public servants and the general populace.

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