IOT BASED ELECTRONIC NOTICE BOARD

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Abstract

This technical paper deals about development of IoT based electronics notice board using available IP based infrastructure & IoT devices. Smart notice board can be developed to make noticing system much simple and faster & cost effective with web & SMS interface the system is platform independent which overcomes the disadvantages of existing Noticing system. Web and SMS interface of system gives access to both IP based as well as cellular based network devices to provide input to the system. This prototype developed can be used to eliminate the need of huge bill boards thus it is also a better method of going green

Index Terms: IoT;Web; SMS

I. INTRODUCTION

Notice board is widely used today in some of the places needs urgent notices like in college, railway stations share-market ,and this notice should be in real-time , so we need a real-time notice. This project is my experiment to give a start to the era of real-time noticing using internet & SMS applications. This project is about writing the message on web page or in simple SMS and sends it to remote server. This message is fetched into Microcontroller and it is displayed on LED screen. Remote server supports SQL database for message storing. SMS gateway enables cellular technology to be interfaced with IoT as benefit of that we can have inbound SMS service which is to be used to transmite message or data to remote server.Also by interfacing a voice data recording IC with Microcontroller we can also do announcements in real-time.

II. BACKGROUND OVERVIEW

A. Existing System

The following are the current technologies
• Manual
• RF based Noticeboard
• Bluetooth based Notice Board • SMS (GSM) based Notice board
• GPRS based Notice board.

B. Drawbacks of Existing System

Following are the drawbacks of existing systems

•   Manual notice Required Human source to show notice on board.

•   Some of the notice boards have limited communication range, since RF module or Bluetooth is used.

•   GPRS based notice board required network coverage for Internet connection.

•   In case of SMS (GSM) based notice board Mobile message plan is required. And only 160 characters can be transmitting at a time.

•   All the noticeboard discussed are Platform Dependent.

That means dependent on a particular.

III.SYSTEM COMPONETS

The Internet of things (IoTs) can be defined as connecting the various types of objects like smart phones, personal computer and Tablets to internet, which brings in very new- fangled type of communication between things and people and also between things[1]. In this project we developed prototype of smart notice board which enable both internet enabled or non-internet enable device such as cellular network based

device to send data to notice board using IoT technology

System development is divided in five parts
- Core IoT Device (Arduino & Ethernet Shield/wifi
Shield)
- Cloud database for Storing message in case of Remote application
- Web Interface for message entry
- SMS interface with help of SMS gateway with inbound
SMS routing service for message entry
- LED or LCD display device

III. SYSTEM COMPONETS

A. *Core IoT Device*

Core IoT device is heart of system which consist of Arduino uno board as IoT device which actually connect to Internet (IP based network) with the help of Ethernet shield or wifi shield in order to receive Notice message from remote web server using simple SQL query request. This board also provide interface for LED matrix board for Notice display purpose

Arduino/Genuino Uno is a microcontroller board based on the ATmega328P. It 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. It contains everything needed to support the microcontroller; we can simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started.

Fig.1 Arduino uno board

The Arduino Ethernet Shield 2 allows an Arduino Board to connect to the internet. It is based on the (Wiznet W5500 Ethernet chip). The Wiznet W5500 provides a network (IP) stack capable of both TCP and UDP. It supports up to eight simultaneous socket connections. Use the Ethernet library to write sketches that connect to the Internet using the Shield. The Ethernet Shield 2 connects to an Arduino Board using long wire-wrap headers extending through the Shield. This keeps the pin layout intact and allows another Shield to be stacked on top of it.

Fig.2 Ethernet Shield

B. *Cloud database on Remote web server*

Cloud database is SQL database designed on remote web server which provide facility to simply store new message entry from web interface or SMS interface (SMS gateway) with help of simple SQL command using PHP page.

SQL is language for the definition, access and manipulation of relational database, SQL database is case sensitive, SQL commands are not[3]. For this project we used MySQL which is open source relational database management system.

C. *Web interface for message entry*

Web interface is designed using PHP page which enables internet enable device such as Smart Phones, personal computer to enter Notice message so it will be routed to remote web server and stored in SQL database on web server using simple SQL command. PHP enables message entry directly on browser or we can use dedicated web application for same purpose.
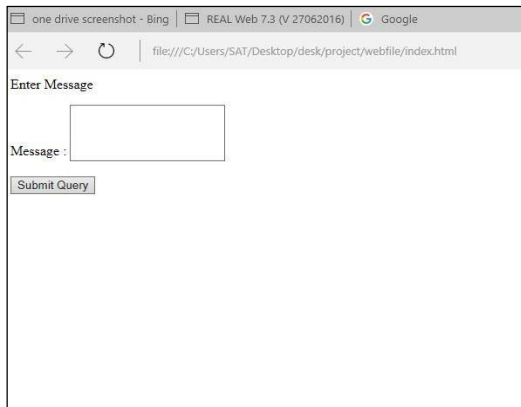
Fig 3 WEB page for Notice message entry

Web application

An application in which all or some parts of the software are downloaded from the Web each time it is run. It may refer to browser-based apps that run within the user's Web browser, or to "rich client" desktop apps that do not use a browser or to mobile apps that access the Web for additional information.

1) Browser Based

In a browser-based Web application, JavaScript instructions are contained within the Web page that is retrieved from a website. Combined with the HTML code that determines the visual layout and the CSS style sheet, the HTML, JavaScript and CSS are executed via the browser. In addition, processing at the server side is often widely performed to access databases and other networks. The data for a Web application may be stored locally or on the Web, or in both locations.

2) Client Based

Web applications may also run without the browser. A client program, which is either installed in the user's computer or mobile device or is downloaded each session, interacts with a server on the Web using standard Web protocols. This is similar to the "client/server" architecture that prevailed in companies before the Internet exploded, except that today the server is often on the Internet rather than the local network. Just like browser-based applications, the data may be stored remotely or locally. See rich client, cloud computing, ASP and SaaS.[3]

3) Mobile Web App

Mobile web applications hold the promise of overcoming this Fragmentation in mobile OSs and App Store marketplaces by Enabling you to develop apps that will run across platforms, Across devices, using open web technologies such as HTML, CSS, JavaScript. These apps can then be hosted on your already existing web server and accessed at a standard URL through the device's web browser.[4]

D. SMS interface with help of SMS gateway with inbound SMS routing service for message entry

SMS Gateway can be defined as a system or mechanism that facilitates SMS transition by transforming the messages from several types of communication media to mobile network traffic, in vice versa, allowing, receiving or transmitting the SMS messages with or without the use of a mobile phone .

The typical working process of SMS gateway system is similar to the concept of regular email or SMS in terms of a system receives a message from the sender client and then conveys it to the receiver client[5]

Routing of SMS is inbound in which SMS is transmitted from mobile network to IP network through SMS gateway.
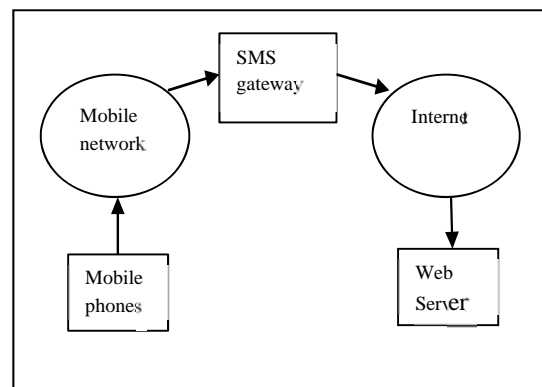SMS gateway routes message to web server

Fig. 4 Inbound SMS routing

IV. CONCLUSION

This project deals about an advanced hi-tech IoT based notice board which is platform independent which overcome the disadvantages of existing Noticing System; This prototype developed can be used to eliminate the need of

huge billboards. Thus it is also a better method of going green.

ACKNOWLEDGMENT

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