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Wireless Notice-Board Using Node MCU

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Abstract— The main objective of this project is to develop a Wireless Notice Board that will be used by the faculty in order to display latest Notice and Announcements. It is a smart board developed as user friendly notice board with wireless concept that offers the flexibility to control the notice board. The notice can be delivered with help of android application and a webpage. This notice board is made to overcome the messy wiring of earlier electronic wired model. It's one objective is to increase the speed of communication and saving time and resources. It can also be used to promote the reusability of existing design and decrease the area required which will manage the cost factor.

Keywords – Arduino;PHP;JSON;Android;Wi-Fi

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I.   INTRODUCTION

In this project, the development of simple and low cost Smart Board is presented. The proposed system uses either Bluetooth or Wi-Fi based wireless serial data communication. For this purpose, Android based application programs for Bluetooth and Wi-Fi communication between Android based personal digital assistant devices and remote wireless display board are used. At receiver end, a low cost microcontroller board (Arduino Uno) is programmed to receive and display messages in any of the above communication mode. Using the developed system, two different applications for displaying messages on a remote digital notice board and wireless person calling has been implemented. The developed system will therefore aim in wirelessly sharing the information with intended users and also helps in saving the time and the cost for paper and printing hardware.

Traditionally, there were notice boards where any information or notice had to be stick daily. This becomes tedious and requires daily maintenance. The objective of this project is to develop a wireless notice board that displays notices when a message is sent from the user's android application device. Smart Board is an electronic based project. This automated system can reduce the manual work. The concept of this project is to design an Internet driven automatic display board. It is proposed to design receiver

cum display board which should be programmed from an authorized mobile phone. This electronic system is a combination of software and hardware. In this paper, to design a model messages are sent through an Internet from an authorized transmitter and then message is transmitted to the microcontroller and the message is read and sent to digital display board.

II.   System Description

The system is low-cost wireless Android and Website based notice board system which is developed to send the desired information instantly to the intended user by using Wi-Fi transceiver module interfaced with a low cost Arduino UNO microcontroller board. The communication mode i.e. Wi-Fi module is selected for data communication using the corresponding transceiver module with microcontroller a client using Arduino software to receive the message from the remote user in Wi-Fi based wireless communication technology. The Web Application can be accessed remotely by URL and authorised person can log in and check the Notices Displayed.
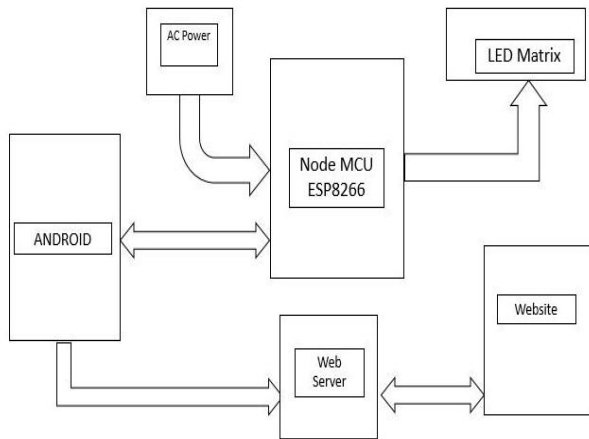
The system block diagram is shown in Fig. 1

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Figure 1System Block Diagram

The smartboard is powered by Arduino with an AC power supply. Arduino is further connected with the ESP8266 WiFi module which enables the wireless connectivity of the smartboard. The LCD display is connected with the WiFi module which carries out serial communication with mobile devices and transfers the data through over the network.

The user needs to go through authentication via the Smartboard android application to get access and then connect to the smartboard using the WiFi. After the connection is established, the authorized user can send a notice in the form of message or through speech to the smartboard which will be displayed on the Smartboard in the display. Once the user sends the notice to the smartboard, the same notice will be saved on the server side of the website, which can be accessed for checking and maintaining the records of the notices being displayed.

A. HARDWARE

1) Arduino

Arduino is an open source computer hardware and software company, project, and user community that designs and manufactures single-board

microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The project's products are distributed as open-source hardware and software, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form, or as do-it-yourself kits. Arduino board designs use a variety of microprocessors and controllers. The boards are equipped with sets of digital and analogue input/output (I/O) pins that may be interfaced to various expansion boards (*shields*) and other circuits. The boards feature serial communications interfaces,

including Universal Serial Bus (USB) on some models, which are also used for loading programs from personal computers. The microcontrollers are typically programmed using a dialect of features from the programming languages C and C++. In addition to using traditional compiler toolchains, the Arduino project provides an integrated development environment(IDE) based on the Processing language project.

Figure 2Arduino UNO

2) ESP8266 Node MCU

The **ESP8266** is a low-cost Wi-Fi chip with full TCP/IP stack and MCU (microcontroller unit) capability produced by Shanghai-based Chinese manufacturer, EspressifSystems. The **ESP8285** is an ESP8266 with 1 MiB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi.ESP8266 (presently ESP8266EX) is a chip with which manufacturers are making wirelessly networkable modules. More specifically, ESP8266 is a system-on-chip (SoC) with capabilities for 2.4 GHz W0i-Fi (802.11 b/g/n, supporting WPA/WPA2), general-purpose input/output (16 GPIO), Inter-Integrated Circuit (I^2C), analog-to-digital conversion (10-bit ADC), Serial Peripheral Interface (SPI), I^2S interfaces with DMA (sharing pins with GPIO), UART (on dedicated pins, plus a transmit-only UART can be enabled on GPIO2), and pulse-width modulation (PWM). The processor core, called "L106" by Espressif, is based on Tensilica's Diamond Standard 106Micro 32-bit processor controller core and runs at 80 MHz (or overclocked to 160 MHz). It has a 64 KB boot ROM, 64 KB instruction RAM and 96 KB data RAM. External flash memory can be accessed through SPI.Further as a Prototype of ESP8266 and Advancement to ESP8266 is added with Node MCU ESP8266.

Figure 3ESP8266 Node MCU Wi-Fi Module

NodeMCU is an open source IoT platform. It is Arduino based MCU board based on non-AVR processors like ARM/SAM MCU and used in ArduinoDue,Arduino IDE is used to modify the the code which is scripted and compiled in C/C++ Languages.Node MCU can be used for AT

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commands easily anc can be Integrated with Arduino which will make coding simple and Less complex.

II.   SOFTWARE

1)   JAVA

Figure 4JAVA

Java is an object-oriented language similar to C++, but simplified to eliminate language features that cause common programming errors. Java source code files (files with a *.java* extension) are compiled into a format called *byte code* (files with a *.class* extension), which can then be executed by a Java interpreter. Compiled Java code can run on most computers because Java interpreters and runtime environments, known as *Java Virtual Machines (VMs),* exist for most operating systems, including UNIX, the Macintosh OS, and Windows. Byte code can also be converted directly into machine language instructions by a just-in-time compiler (JIT). In 2007, most Java technologies were released under the GNU General Public License.

2)   XML

Figure 5XML

In Computing Extensible Mark-up Language (XML) is a Mark-up language that defines a set of rules for encoding documents in a format that is both human-readable and machine-readable. The W3C's XML 1.0 Specification and several other related specifications—all of them free open standards—define XML.

The design goals of XML emphasize simplicity, generality, and usability across the Internet. It is a textual data format with strong support via Unicode for different human languages. Although the design of XML focuses on documents, the language is widely used for the representation of arbitrary data structures such as those used in web services.

3)   JSON

Figure 6JSON

JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write. It is easy for machines to parse and generate. It is based on a subset of the JavaScript Programming Language, Standard ECMA-262 3rd Edition - December 1999. JSON is a text format that is completely language independent but uses conventions that are familiar to programmers of the C-family of languages, including C, C++, C#, Java, JavaScript, Perl, Python, and many others. These properties make JSON an ideal data-interchange language.

4)   ANDROID

Figure 7Android

Android is a mobile operating system developed by Google, based on the Linux kernel and designed primarily for touch screen mobile devices such as smart phones and tablets. Android's user interface is mainly based on direct manipulation, using touch gestures that loosely correspond to real-world actions, such as swiping, tapping and pinching, to manipulate on-screen objects, along with a virtual keyboard for text input. In addition to touch screen devices, Google has further developed Android TV for televisions, Android Auto for cars, and Android Wear for wrist watches, each with a specialized user interface. Variants of Android are also used on notebooks, game consoles, digital cameras, and other electronics.

5)   PHP

Figure 8PHP

PHP started out as a small open source project that evolved as more and more people found out how useful it was. RasmusLerdorf unleashed the first version of PHP way back in 1994.

a.   PHP is a recursive acronym for "PHP: Hypertext Preprocessor".
b. PHP is a server side scripting language that is embedded in HTML. It is used to manage dynamic content, databases, session tracking, even build entire e-commerce sites.
c. It is integrated with a number of popular databases, including MySQL, PostgreSQL, Oracle, Sybase, Informix, and Microsoft SQL Server.
d. PHP is pleasingly zippy in its execution, especially when compiled as an Apache module on the Unix side. The MySQL server, once started, executes even very complex queries with huge result sets in record-setting time.

_e._ PHP supports a large number of major protocols such as POP3, IMAP, and LDAP. PHP4 added support for Java and distributed object architectures (COM and CORBA), making n-tier development a possibility for the first time.

_f._ PHP is forgiving: PHP language tries to be as forgiving as possible.

_g._ PHP Syntax is C-Like.

III. CONCLUSION

Hence we will be concluding that, by introducing the concept of smart wireless notification board which will make the communication more efficient and faster, with great efficiency we can display the message with less errors and maintenance.

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