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Survey Paper on StatNOW: Availability Status Displayer

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Abstract: *We are experiencing a new era of Internet of things (IoT), where many electronic devices surrounding us are interconnected by a network. The emerging of IoT also sheds new light on the concept of "Status Notifier". NodeMCU is an open source Lua based firmware and development board specially targeted for IoT based applications. It includes firmware that runs on ESP8266 Wi-Fi from the hardware which is based on the ESP module. This proposed design uses web application platform for collecting and visualizing data and updating it on LCD display. The retrieval of data from apache server is conducted using NodeMCU and ESP8266 microcontroller board. With this smart project we can also monitor the humidity and temperature of a particular office room. However to the best of our knowledge literature lacks research focusing on digitization of communication in public departments introduced in IoT through interactions among different devices supporting a smart architecture. To do so, we make a Status Notifier IoT architecture that enables user to get updates regarding availability from authority figures..*

Keywords: Node MCU ESP82 66, Internet of Things (IoT), Status Notifier

I. INTRODUCTION

We are developing a smart IOT based notification system, where the visitors get easily updated with availability status by the teachers or staff members. It can save the time of person waiting outside the cabinet. “Internet of Things” is a recent technology that creates a global network of machines and devices that are capable of communicating and exchanging data with each other through the Internet. The main idea of using the Internet of Things is to have a smart system and to connect billions of devices over the whole world.

The Internet of things describes physical objects that are embedded with sensors, processing ability, software, and other technologies, and that connect and exchange data with other devices and systems over the Internet or other communications networks. The personal or business possibilities are endless. A ‘thing’ can refer to a connected medical device, a biochip transponder (think livestock), a solar panel, a connected automobile with sensors that alert the driver to a myriad of possible issues (fuel, tire pressure, needed maintenance, and more) or any object, outfitted with sensors, that has the ability to gather and transfer data over a network.

Internal source data starts at the sensor. Converting that data into a digital payload, and then wrapping it with protocols so it can be sent on the network, is the work of a software agent that lives on the embedded system. This is the edge of the IoT network, from which the data payload is gathered and sent over the operational technology network to the IT network. From there, the data makes its way to the public cloud and then into a database, where it can be processed by analytics software or artificial intelligence. This processing creates models that produce information that is stored in the company’s business systems which various departments within the company can access and use to streamline and improve how they operate. Our system based on:

- IOT enables the admin to set their availability preferences to let their employee know when they prefer to work and when they prefer not to work.
- With the help of this system the admin can update their availability status through internet which will display on the LCD.

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- The system will also consist of temperature and humidity sensor which will detect the room temperature and humidity.

With IoTs rapid deployment coming into contact with multiple IoT devices every day will be unavoidable soon. Central to both digital transformation and IoT is data. This process performed by the IoT platform is what drives digital transformation. The IoT platform that enables the digitization of physical products and the collection of their data also provides the digital link between a company and its products and customers.[1]

1.1 Goals or Objectives

- To update the availability status of the staff person through internet and display it on the LCD outside Staff Room/Office
- To detect the room temperature and humidity.

II. LITERATURE SURVEY

"A review on IOT and IOE .This paper states that, the current prominence and future promises of the Internet of Things (IoT), Internet of Everything (IoE) and Internet of Nano Things (IoNT) are extensively reviewed and a summary survey report is presented. The analysis clearly distinguishes between IoT and IoE which are wrongly considered to be the same by many people. Upon examining the current advancement in the fields of IoT, IoE and IoNT, the Paper presents cenarios for the possible future expansion of their applications. [2]

"Large-scale assessment of mobile notifications In this paper we present the first large-scale analysis of mobile notifications with a focus on users' subjective perceptions. We derive a holistic picture of notifications on mobile phones by collecting close to 200 million notifications from more than 40,000 users. Using a data-driven approach, we break down what users like and dislike about notifications. Our results reveal differences in importance of notifications and how users value notifications from messaging apps as well as notifications that include information about people and events. Based on these results we derive a number of findings about the nature of notifications and guidelines to effectively use them.[3] "Comparative Analysis of Web Development Stacks this paper is about A technology stack is a combination of programs working together to produce a result. Technology stack is a package of programming languages, framework, and tools used by a web developer for design of web based or mobile based applications. Applications comprises of two component front-end, the visual part which the users interact with and the back-end where the business logic is written and which works behind the scenes. Various types of technology stacks are LAMP, WAMP, MEAN, MAMP.[1].

2.1 "When I Work (App)

The When I Work apps for iPhone and Android let you easily access information in your When I Work account no matter where you are. If you're a Supervisor, Manager, or Admin who needs to set up a time clock terminal on an iPad or Android device, follow our steps to download and set up a time clock terminal. This app allows you to set your availability preferences that your employer can take into account when building the schedule. Your employer has the option to disable the availability feature. If the feature is disabled , management can enter preferences on your behalf.[5]

2.2 "Microsoft Teams (App)

Microsoft Teams is a collaboration app that helps your team stay organized and have conversations—all in one place. Here's a quick look at the left hand side of Teams. Teams - Find channels to belong to or create your own. Inside channels you can hold on-the-spot meetings, have conversations, and share files. This app lets your coworkers know whether you are available for communication. It only shows online presence and no way actually knowing whether they are physically present in their office.[6]

2.3 "Desk Time APP

DeskTime computer tracking software lets you track employee activity on PC and Mac by noting every website, program, and application that's being used and categorizing them as productive or unproductive. Use DeskTime - the employee computer monitoring software - to see what websites, programs, and apps your teammates are using. Are they working on work- related tasks? Or can they improve their efficiency? Get the complete productivity analytics with DeskTime!

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DeskTime computer tracking software lets you track employee activity on PC and Mac by noting every website, program, and application that's being used and categorizing them as productive or unproductive. By monitoring employee internet usage, managers can track working hours and make sure that everyone dedicates their office time to work-related tasks. This computer tracking software lets you track employee activity on PC and Mac by noting every website, program, and application that's being used and categorizing them as productive or unproductive.[2]

2.4 "Timely (App)

Timely started with a desire to simplify the way people use their alarm clocks. Our team designed a novel way to set an alarm. Swiping from the edge of the screen allows you to instantly set the desired time by dragging a bar. This intuitive gesture makes the experience more enjoyable than ever before.

The app's automatic time tracking software helps companies stay connected with their workforce and report accurately on their business from billing and project management, to team management and resource planning.[3]

III. Proposed Work

3.1 Flow of the System

Remote operation is achieved by any smart- phone/Tablet etc., with Android OS, upon a GUI (Graphical User Interface) based touch screen operation. While the user sends the message from the android application device, it is received and retrieved by the display unit. It is then sent to the microcontroller that further displays the notice sent from the user on to the electronic notice board which is equipped with a 20X4 LCD display.

The user will start the internet connection and the app and hardware will get initialized which will give control to the app. After which will be logging into the system via id and password by successful login system home page will be displayed and can update the status this will get stored in database if updated then logout .

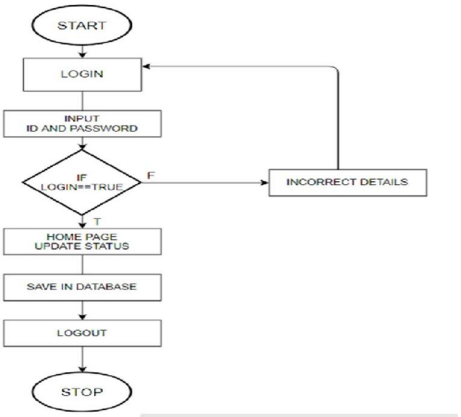

Figure 1: Software Flowchart for status notifier processing

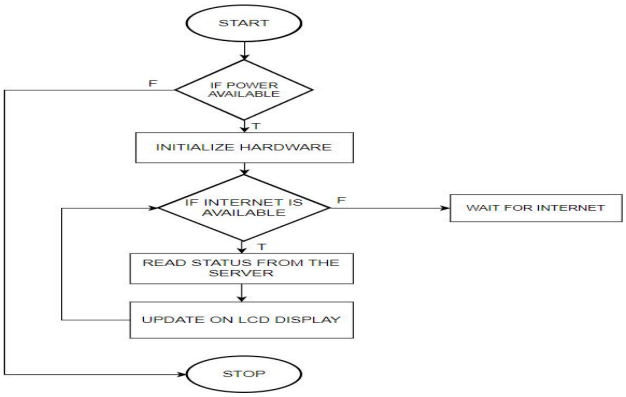

Figure 2: Hardware Flowchart for status notifier processing

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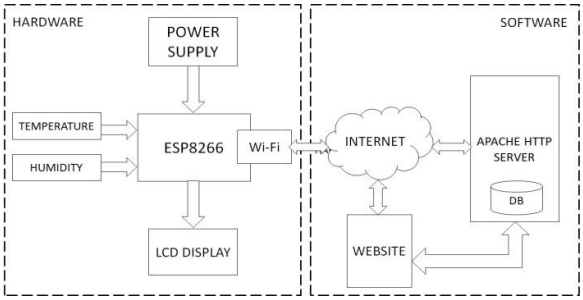

Figure 3: System Architecture

3.2 Functional Modules

The whole system is divided into four modules. They are Design Hardware, Implementation of software & Integration of software and hardware.

A. Design Hardware

Printed circuit boards (PCBs) are the foundational building block of most modern electronic devices. Whether simple single layered boards used in your garage door opener, to the six layer board in your smart watch, to a 60 layer, very high density and high-speed circuit boards used in super computers and servers, printed circuit boards are the foundation on which all of the other electronic components are assembled onto. Before we start drawing wires and stuff, we need to know what circuit we want to build. So we need a circuit diagram. we can either find one that someone else has made, we designed our PCB from scratch through PROTEUS 8 PROFESSIONAL. And we did our interfacing through Arduino IDE

Figure 4: PCB Connected with LCD Board

B. Implementation of Software

We would be creating a simple web application through bootstrap to control the LCD display. Bootstrap is an HTML, CSS & JS Library that focuses on simplifying the development of informative web pages (as opposed to web apps). The primary purpose of adding it to a web project is to apply Bootstrap's choices of color, size, font and layout to that project. As such, the primary factor is whether the developers in charge find those choices to their liking. Once added to a project, Bootstrap provides basic style definitions for all HTML elements. The result is a uniform appearance for prose, tables and form elements across web browsers. In addition, developers can take advantage of CSS classes defined in Bootstrap to further customize the appearance of their contents. For example, Bootstrap has provisioned for light- and dark-colored tables, page headings, more prominent pull quotes, and text with a highlight.

Figure 5: Android Application

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C. Integration of Software and Hardware

A hardware-integrated solution, simply put, means a mobile system that is combined with outlying hardware in order to connect the two through an Web app, or other technology system. The goal of hardware integration is to use web browser which can be opened on mobile phones to replace other, traditional forms of controlling hardware, like a remote.

Figure 6: Integration of software and hardware

D. Hardware

The physical entity that you want extract data from. For example, a thermometer, camera, lasers, weighing scales, a measuring device or robot.

- A Sensor – a device that converts the analogue signal from the hardware into digital data for processing by a computer.
- A Connector (technical term "communication bus") to transfer the information between the hardware and a computer. The most common connectors are USB cables, Wi-Fi, Bluetooth and Ethernet connections.

E. Software

A program that tells the hardware what tasks to perform, e.g. what measurements to take.

IV. CONCLUSION

We have designed and developed a Smart Status Notifier by applying engineering knowledge which provides an approach in building a device where users can get availability directly from authority figures. It solved the critical problem of society by saving lots of time and energy of visitors who do not know the whereabouts of staff person until they come to the office. We have identified and analyse problem in current situation where staff people leave their office for various reasons they have no way of updating their status that is when they would be available at their office, hence we found the solution by developing STATNOW a availability status displayer, in which they can directly update their availability through our webapp which will be displayed on LCD outside their office room.

We have used modern tools like Arduino IDE and hardware components like Node MCU ESP- 8266, LCD, LCD Module, DHT 11 sensor, etc to implement this project. During the development of the project, we understood the importance of individual and team work while project management. While showcasing our project through various seminars, we enhanced our communication skills and displayed professional ethics which results in life long learning.

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