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IOT Based Industrial Data Monitoring System Using Arduino

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ABSTRACT— The Internet of Things applied to Industry (IIoT) is one of the pillars of Industry The connection to Internet of all the industrial devices, and the storage (sharing) of enormous amount of data inside Cloud database, enable the development of analysis algorithms for the delivery of new "high value" services. However, the industrial market may require response with short predictable latency (realtime response) even for supervision and optimization functions. Often today, the estimation of the latency of new services is not taken into account. For all these reasons, this work introduces an experimental measurement procedure for investigating the impact of Cloud database services on the communication delay from the production line to the Cloud and the wayback (feedback). a use case demonstrates the feasibility of the proposed test methodology. In details, the considered use case is a predictive maintenance system with Siemens S7 industrial automation controller sending data to a Cloudant database inside the IBM Bluemix platform. The use case results show that the IIoT solutions based on Cloud database services can be easily evaluated, compared (and optimized) thanksto the proposed approach

I. INTRODUCTION

The Internet of Things (IOT) has emerged as a significant developing technology for the future, in which a plethora of sensors, actuators, and smart things in our daily lives are linked to the Internet. These Sensors and actuators (for example, security cameras, household appliances, and environmental monitoring sensors) are often outfitted with various microcontrollers, transceivers, and protocols for communicating sensing and control data. These real- world gadgets, either sensors or actuators, are linked together to convey sensed data to centralised servers, where information is collectively stored and made available to specific users with appropriate access credentials. Data is transferred from one sensor/actuator node to an IOT server using a new communication paradigm known as Machine Type Communications (MTC) or Machine-to-Machine (M2M). Not only in industry, but also in our homes, safety is a vital concern. One of the most prevalent concerns that must be provided for in dwellings is fire or temperature. Temperature is an important metric to monitor in companies to minimise accidents. Aside from that.

II. PROPOSED WORK

The majority of home automation systems designed and developed today are based on asingle microcontroller platform and can regulate and monitor a variety of vital characteristics including humidity, temperature, smoke, light, and many more [6]. Because most electrical gadgets now have easy internet connection, home automation systems may manage appliances from any device, including smartphones, computers, and tablets.

This paper first illustrates the suggested system based on the Bolt IoT platform, then discusses the achieved findings, and lastly the future scope and conclusion.

The system is thought to be composed of the following subsystems:

1. Control
2. Safety
3. Security

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III. HARDWARE REQUIREMENTS

A. RELAY

A power relay module is an electrical switch thatis operated by an electromagnet. The electromagnetis activated by a separate low-power signal from a micro controller.When activated, the electromagnetpulls to either open or close an electrical circuit.

B. DHT11 SENSOR

The DHT11 is a simple and inexpensive digital temperature and humidity sensor. It measures the ambient air with a capacitive humidity sensor and a thermistor and outputs a digital signal on the data pin (no analogue input pins are required). It's quite straightforward to operate, but data collection requires precise timing. Thermistor is a variable resistor that changes resistance as temperature varies.They both sense the temperature and humidity of the region and send the results to the IC (which is located on the back side of the sensor). VCC, Ground, data Out, and NC are the four pins on the sensor. Superior audio quality is provided by connecting the VCC and Ground pins to the common VCC and Ground.

C. ESP8266 (WI-FI MODULE)

The ESP8266 WiFi Module is a self-contained SOC with an inbuilt TCP/IP protocol stack that can provide access to your WiFi network to anymicrocontroller.The ESP8266 is capableofeither hosting an applicationoroffloading all Wi-Fi networking functions fromanotherapplicationprocessor.

D. 16X2 LCD DISPLAY

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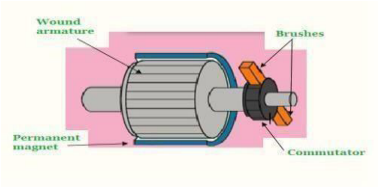
The 16x2 LCD display is a relatively basic module that is frequently used in DIY projects and circuits.
The16x2 converts a display of 16 characters per line into two such lines. Each character is presented in a 5x7 pixel matrix on this LCD.

E. FAN

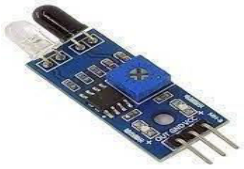
This circuit will turn on/off 12V DC fan or CPU fanwhen temperature above normal temperature.Youcan set turn on temperature by adjust VR1.

F. DC MOTOR

DC motors are suitable for a wide range of applications, including conveyors and turntables,where adjustable speed and constantor low-speed torque are required. They are also effective in dynamic braking and reverse applications, which are ubiquitous in many industrial machines.



G. I R SENSORS



An infrared sensor (IR sensor) is a radiation- sensitive optoelectronic component with a spectral sensitivity in theinfrared wavelength range 780 nm … 50 µm. IR sensors are now widely used in motion detectors, which are used in building services to switch on lamps or in alarm systems to detect unwelcome guests.

H. BUZZER

A buzzer, often known as a beeper, is a type of audiosignalling device that can be mechanical, electromechanical, or piezoelectric (piezo for short).

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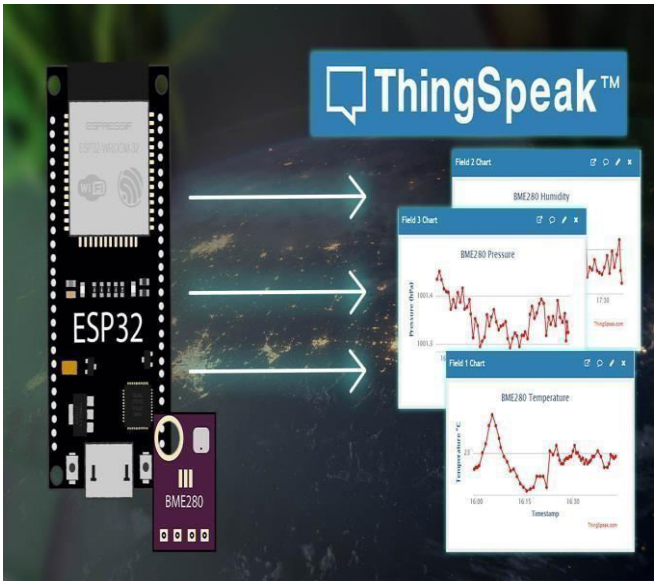
IV. SOFTWARE REQUIREMENTSA .ARDUINO UNO IDE

The Arduino Integrated Development Environment (IDE), sometimes known as the Arduino Software (IDE), has a code editor, a message area, a text console, a toolbar with buttons for basic functions, and a series of menus. It communicates with and uploads programmes to the Arduino hardware.

B. EMBEDDED C:Embedded C is the most widely used programming language in the software industry for creating electronic devices. Every processor inan electronic system is linked to embedded software.

C . THING SPEAK



ThingSpeakTM is a cloud-based IoT analytics platform service that allows you to gather, visualise, and analyse live data streams. ThingSpeak delivers real-time visualisations of data sent to ThingSpeak by your devices.

V. CONCLUCSION

A cost-effective system for automation control, safety and security of non-commercial places such as homes and commercial buildings such as factories were described. The system is based on the Bolt IoT platform. The entire

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system is further divided into subsystems, which takes care of control,safety and security of the premises. This interface is access the devices can be controlled from anywhere in the world. The safety subsystem monitors temperatures in the building and would alert the user using call and SMS services through twilio.com.

VI. RESULTS AND DISCUSSION

VI. EXPECTED OUTCOMES

The project is structural modeling-based and can produce the needed results. With little tweaks, it can be successfully implemented as a Real Time system. Because science is discovering or generating big breakthroughs in numerous disciplines, technology is constantly changing. Furthermore, most of the units can be manufactured on a single chip with a microprocessor, making the system compact and the present system more efficient.

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