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IoT Based Industrial Automation

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ABSTRACT

Nowadays Internet of Things (IoT) is the advance technology. In this paper, we present an efficient system for automating industry appliances/machines, which can be controlled efficiently through internet. As part of our project, we aim to connect the unconnected and evolve machine-to-machine communication. Being at one place, users will have access to all the machines in the industry. It will automate the entire process. We propose a system to automate the industry by enabling efficient control of equipment and appliances via the internet.

Key words: Power Quality, Pulse Voltage, Transmission System

INTRODUCTION

The field of automation has had a notable impact on a wide range of industries beyond manufacturing. Automation relies on control systems and information technology to reduce the need for human labor in production. In the scope of industrialization, automation is a step beyond mechanization. Whereas mechanization provides human operators with machinery to assist them with the muscular requirements of work, automation greatly decreases the need for human sensory and mental requirements as well. Automation plays an increasingly important role in the world economy. One of the important applications of automation is in the soft drink and other beverage industries, where a particular liquid has to be filled continuously. For these kind of applications the trend is moving away from the individual device or machine toward continuous automation solutions. Totally Integrated Automation puts this continuity into consistent practice. Totally Integrated Automation provides automation for every step of the production process, from receipt of goods to production, filling to packaging to shipment of goods. Our project is also an automation application, where we have developed a bottle filling system. Our project involves filling and capping bottles simultaneously. The filling and capping operations happen in a synchronized manner, and we also provide a volume selection menu through which the user can select the volume to fill in the bottles. The entire system is more flexible and time saving.

LITERATURE SURVEY

The concept of the Internet of Things was introduced by members of the radio frequency identification development community in 1999. This concept is very popular because of mobile devices, embedded and real-time communication, cloud computing, and data analytics. It is a network of physical objects embedded with electronics, software, and sensors which can collect data from the world around us and share that data across the internet. [1] The future M2M market will be fuelled by the wide variety of applications that this technology enables. The proposed system utilizes GPRS to communicate between monitor and industrial plant, eliminating the distance barrier and enabling automation from anywhere.

GOALS AND OBJECTIVES

To develop a system this will automatically monitor the industrial applications and generate Alerts/Alarms or take intelligent Decision using concept of IoT and also design the system to Take Intelligent Decision and Control Devices.

INTERNET OF THINGS (IOT)
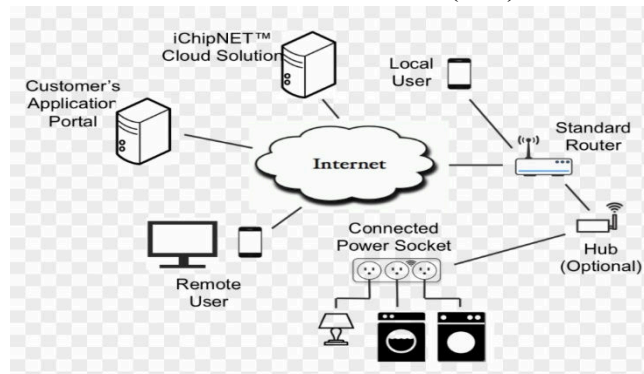
Fig. 1 Diagram of Internet of Things

The Internet of things (IoT) is the arrange of physical gadgets, vehicles, buildings and other items—embedded with hardware , computer program, sensors, actuators, and arrange network that empower these objects to gather and trade information.The IoT allows Objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit. When IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of hyperphysical systems, which also encompasses technologies such as smart grids, smart homes, intelligent transportation and smart cities. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure.
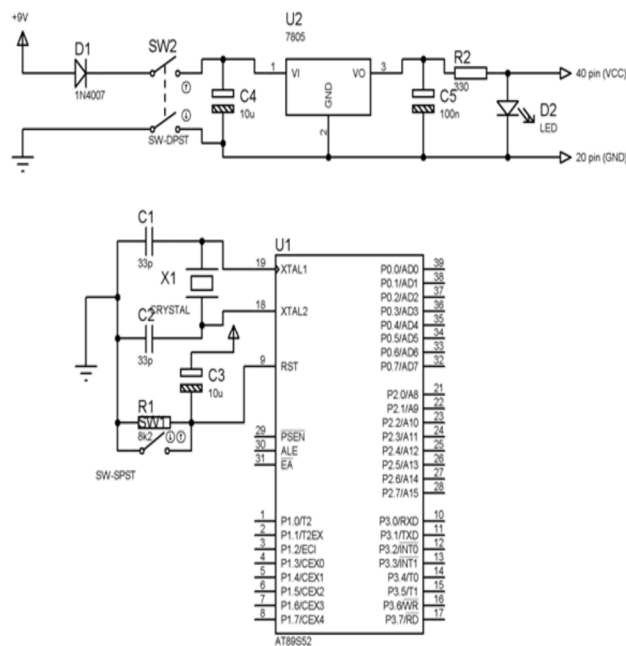
BLOCK DIAGRAM
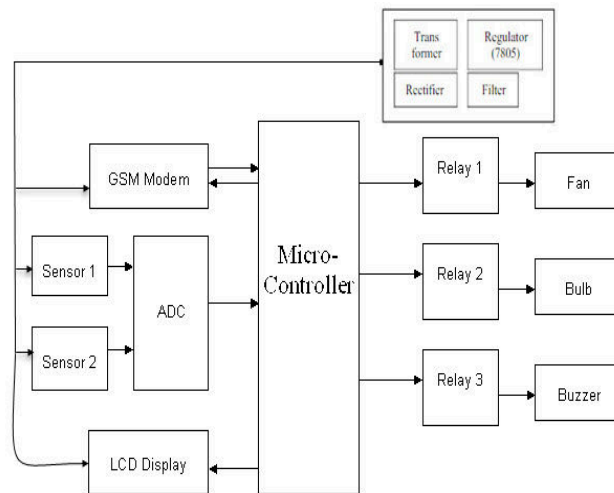
Fig. 2 Block diagram of IOT based Industrial automation

HARDWARE AND SOFTWARE REQUIREMENTS:

*Hardware Requirements*
1) AT89S52

Fig. 3 Circuit Diagram of IOT based Industrial Automation

The AT89S52 provides the following standard features: 8K bytes of Flash, 256 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, three 16-bit timer/counters, a six vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry. In addition, the AT89S52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port, and interrupt system to continue functioning. The Power-down mode saves the RAM con-tents but freezes the oscillator, disabling all other chip functions until the next interrupt or hardware reset.

2) *IR sensor*
An infrared sensor is an electronic device that emits and/or detects infrared radiation in order to sense some aspect of its surroundings. Infrared sensors can measure the heat of an object, as well as detect motion.
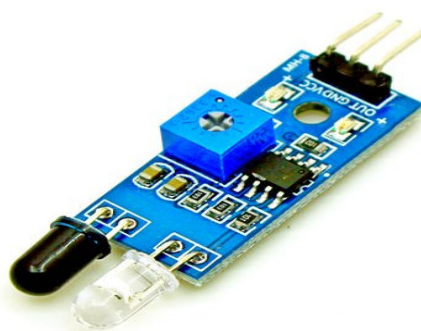

Fig. 4 IR Sensor

IR Sensors work by using a specific light sensor to detect a select light wavelength in the Infra-Red (IR) spectrum. By using an LED which produces light at the same wavelength as what the sensor is looking for, you can look at the intensity of the received light. When an object is close to the sensor, the light from the LED bounces off the object and into the light sensor. This results in a large jump in the intensity, which we already know can be detected using a threshold.

3) Switch

A switch is a component which controls the openness or closeness of an electric circuit. They allow control over current flow in a circuit (without having to actually get in there and manually cut or splice the wires). Switches are critical components in any circuit which requires user interaction or control
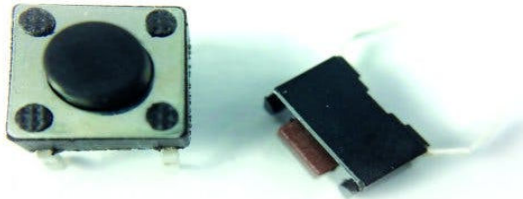
Fig. 5 Motor driver IC (L293D)
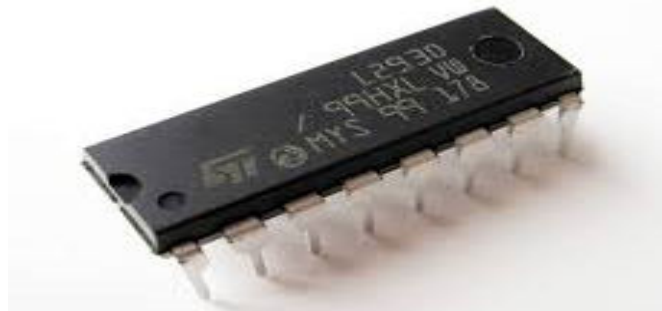
Fig. 6 Motor driver IC

Software Requirements
1. ARDUINO IDE
2. THINGSPEAK
3. FUSION 360
4. MATTERCNTROL 3D DESIGN
5. PROTEUS
6. FRITZING

APPLICATIONS

1) Smart Medical:

A connected healthcare environment promotes the quick flow of information and enables easy access to it. Improved home care facilities and regular health updates to clinicians reduce the chances of redundant or inappropriate care, improve patient care and safety, and reduce overall costs of care. Connected health solutions can also be used to track lifestyle diseases such as hypertension, diabetics and asthma which need continuous monitoring. The IoT-MD provides an environment where a patient's vital parameters get transmitted by medical devices via a gateway onto secure cloud based platforms where it is stored, aggregated and analyzed. It helps store data for millions of patients and perform analysis in real time, ultimately promoting an evidence-based medicine system.

2) Machine to Machine:

M2M communication is something that involves a large number of intelligent machines that share information and make collaborative decisions without direct human intervention. This potentially leads to achieving improved cost efficiency. M2M offers the telecommunication industry a great opportunity as it needs a lot of communication systems via various technology families, such as IP, RFID, sensor networks, smart metering, etc.

3) Smart Grid:

The data generated in a smart grid is more than that generated in a traditional grid due to the continuous two way communication between the parent utility and the smart meter at the customer's home or business setup. If the infrastructure isn't ready for such communication, it can be a barrier to smart grid deployment. Here, IoT technology plays an important role. It can help streamline the transfer of high volume data over an internet protocol. The IoT is also

needed to establish seamless and effective communication between context aware sensors and the smart meter installed at the user site for automatically switching the devices on or off based on load patterns

FUTURE SCOPE

Automation through IoT can help to get rid of the short distance communication. Thus, introducing internet in industries can help to have control over the application from anywhere in the world [6]. The following Fig 4 illustrates how IoT can help to ease the life in industries as well as in other fields.
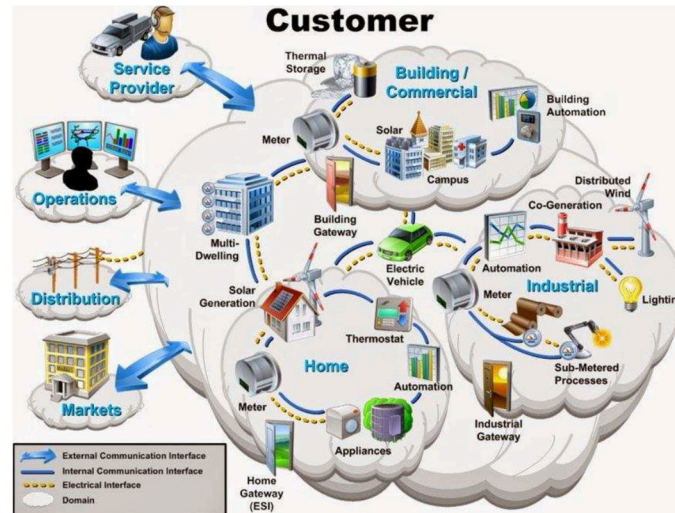

Fig. 7 Smart Grid

CONCLUSION

Nowadays we require everything computerized. We have as it were utilized camera for all the purposes. In mechanical regions to diminish manual overhead we have actualized Web of Things (IoT) in Industry. As in some cases it'll be late in this process and it'll hurt to property as well as life. For this reason, we are creating a system for Mechanization utilizing IoT with the of Manufactured Insights to create framework computerized the framework created employments fundamental transport belt component for bottle measure discovery and tallying number of bottles. This framework too gives us adaptability for controlling transport belt from computer side.

REFERENCES

[1]. Mark D. Sen Gupta, CSIA Executive Conference San Diego, April 2014.
[2]. M. Kim and K. Kim, AUTOMATED RFID-BASED IDENTIFICATION SYSTEM FOR STEEL COILS, Progress in Electromagnetics Research, Vol. 131, 1–17, 2012
[3]. S.D.T. Kelly, N.K. Suryadevara and S.C. Mukhopadhyay Towards the Implementation of IoT for Environmental Condition Monitoring in Homes, IEEE Paper 2013
[4]. Jinsung Byun, Insung Hong, Byoungjoo Lee, and Sehyun Park, Member Intelligent Household LED Lighting System Considering Energy Efficiency and User Satisfaction, IEEE paper February 2013
[5]. GopinathShanmugaSundaram, BhanuprasadPatibandala, Harish Santhanam Bluetooth Communication using a Touchscreen Interface with the Raspberry Pi 978-1- 4799-0053-4/13/31.00 2013 IEEE
[6]. Li Da Zu" Internet of Things in Industries: A Survey" IEEE Transactions on Industrial Informatics, vol. 10, no. 4, November 2014
[7]. Sadeque Reza Khan Professor Dr. M. S. Bhat "GUI Based Industrial Monitoring and Control System ``IEEE paper, 2014
[8]. Li Da Zu" Internet of Things in Industries: A Survey" IEEE Transactions on Industrial Informatics, vol. 10, no. 4, November 2014
[9]. Sadeque Reza Khan Professor Dr. M. S. Bhat "GUI Based Industrial Monitoring and Control System ``IEEE paper, 2014
[10]. AymanSleman and Reinhard Moeller ``Integration of Wireless Sensor Network Services into other Home and Industrial networks "IEEE paper.

[11].   Rajeev Piyare and Seong Ro Lee`` Smart Home-Control and Monitoring System Using Smart Phone'' ICCA 2013, ASTL Vol. 24, pp. 83 - 86, 2013 © SERSC 2013

[12].   Jinsoo Han, Chang-Sic Choi, Wan-Ki Park, Ilwoo Lee Green home energy management system through comparison of energy usage between the same kinds of home appliances 2011 IEEE 15th International Symposium on Consumer Electronics.