

Survey on IOT Industry Protection System Using Arduino

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Abstract

Internet of Things (IoT) plays a key role in the new generation of industrial automation systems (IASs). Evolving IoT standards if effectively used may address many challenges in the development of IASs. However, the use of the IoT and the REST architectural paradigm that IoT is based on is not an easy task for the automation engineer. In this paper, a model driven system engineering process is adopted for IASs and it is extended to exploit IoT standardization efforts in IEC 61131 based system. IoT is considered as an enabling technology for the integration of cyber-physical and cyber components of the system and humans, bringing into the industrial automation domain the benefits of this technology. A UML profile for IoT is exploited to automate the generation process of the IoT wrapper, i.e., the software layer that is required on top of the IEC 61131 cyber part of the cyber physical component to expose its functionality to the modern IoT IAS environment. A prototype implementation and performance measurements prove the feasibility of the presented approach.

Keywords: - *Industrial Automation Thing, Internet of Things (IoT), UML profile for IoT (UML4IoT), IEC 61131.*

INTRODUCTION

As the society is growing with various developments, the outmoded forms of storing various food products in cold store

rooms is failing to satisfy human needs. Through the monitoring of the temperature and humidity inside cold storage rooms, the goodness of the products can be ensured for

a longer time. Recent research has revealed that operations of wireless sensor systems are largely affected by their on-board temperature [1]. We can implement sensors in wide area over the machines and instruments and control and monitor the circumstances by using concept of IoT [2]. As we are making use of Internet the system becomes secured and live data monitoring is also possible using IoT system [3]. In this paper we have designed a gateway which will be the central part of this whole system. The function of the gateway is to gather data, process them, upload them and process user control information. If the network connection is not established then the data will be stored and upon reestablishment of the network it will be uploaded. The terms of "things" in the IoT vision is very broad and includes a variety of physical elements. The terms of things include portable personal items such as smart phones, tablets and digital cameras. Furthermore, IoT includes elements of our environments (be it home, car or office), and things equipped with RFID tags connected to a gateway device. From those mentioned so far, a huge number of devices and things will be connected to the Internet, each providing data and information and some even services. With the rapid increase in the number of user of the internet over the pass

decades made the internet as the part of the life and IoT is the latest and emerging technology.

LITERATURE SURVEY

[1] H. S. Raju, Sanath Shenoy Siemens Technologies and Services Private Limited in "Real-Time remote monitoring and operation of Industrial Devices using IoT and Cloud" 978-1-5090-5256-1/16/\$31.00-2016 IEEE have explained recent times there has been significant advances in managing different types of sensors and industrial devices by IoT (Internet of Things) protocol. Along with the availability of massive amount of processing power provided by the Cloud new opportunities have emerged for complete automation of industrial devices. IoT has a vast application in different sectors and domains which are yet to be explored. In industry domain, industrial automation is need of the hour to increase the time to market with high grade quality and enhanced productivity. In this paper we explain proven ways to utilize the capabilities of Cloud and IoT to control the device and analyze the data generated by them.

[2] "IoT-based Integration of IEC 61131 Industrial Automation Systems: The case of UML4IoT" by Foivos Christoulakis,

Kleanthis Thramboulidis- 978-1-5090-0873-5/16/\$31.00 ©2016 IEEE have explained that Internet of Things (IoT) plays a key role in the new generation of industrial automation systems (IASs). Evolving IoT standards if effectively used may address many challenges in the development of IASs. However, the use of the IoT and the REST architectural paradigm that IoT is based on, is not an easy task for the automation engineer. In this paper, a model driven system engineering process is adopted for IASs and it is extended to exploit IoT standardization efforts in IEC 61131 based system. IoT is considered as an enabling technology for the integration of cyber-physical and cyber components of the system and humans, bringing into the industrial automation domain the benefits of this technology. A UML profile for IoT is exploited to automate the generation process of the IoT wrapper, i.e., the software layer that is required on top of the IEC 61131 cyber part of the cyber physical component to expose its functionality to the modern IoT environment. A prototype implementation and performance measurements prove the feasibility of the presented approach.

[3] “An IoT Architecture for Things from Industrial Environment” by Ioan

Ungurean1,*, Nicoleta-Cristina Gaitan1 and Vasile Gheorghita Gaitan1978-1-4799-2385-4/14/\$31.00 ©2014 IEEE told that there are significant changes in industrial process control, intelligent building control and automation technologies under pressure to reduce operating costs and to integrate important advances in telecommunications and software. The software has become an essential factor in production and enterprise-wide systems. Internet connection has fundamentally changed the arrangements for monitoring and control, and the use of open/public standards and personal computer systems (PCs, tablets, smart phones) bring significant benefits to their users and producers. This led to the definition of Industry 4.0 that brings the concept of the Internet of Things in the industry.

[4]. Elizabeth Kadiyala, ShravyaMeda, Revathi Basani, S. Muthulakshmi in “Global Industrial Process Monitoring Through IoT Using Raspberry Pi” with 978-1-5090-5913-3/17/\$31.00-2017 IEEE have explained that the fast increment in the quality of client of the internet over the previous decade has made the internet as a feature of the life and IoT is the most recent and developing innovation. Internet of Things (IoT) is developing systems of ordinary item from customer merchandise

to mechanical machine that can share data and complete and while you are occupied with different exercises. This system is planned minimal effort and expandable permitting a variety of device to be monitored. In this project only sensors has been monitored for better result they has to be controlled wirelessly through IoT.

[5]. Md.Shaedul Islam in “An Intelligent System on Environment Quality Remote Monitoring and Cloud Data Logging Using Internet of Things (IoT)” has told that the society is heavily influenced by environmental pollution. For this reason, the scientist and Engineer are desperately focused on their environment pollution measurement system invention.

This paper presents an intelligent system which has highly efficient, low cost, low power consumption, air, sound and water quality real-time monitoring and quality parameters show on the webpage as well as on device LCD display and E-mail or SMS Alert using the Internet of Things.

The proposed system is developed for our industry and Home environment. By the system, we can detect from air harmful gases like CO₂, CO, LPG, Smoke, alcohol, benzene, NH₃ Temperature and parameters of water quality like pH, Temperature and

also detect sound pollution. The sensed data will upload to cloud server using GPRS modem. The system design by ARDUINO UNO R3 microcontroller based multisensory connected device and also connected a GPRS modem to transmit the sensed data to the cloud server. The device has two-way power system renewable energy and AC power.

[6]. Ananya Roy, Prodipto Das, Rajib Das in “Temperature and Humidity Monitoring System for Storage Rooms of Industries” 978-1-5386-0627-8/17/\$31.00 c 2017 IEEE have explained that Internet of Things (IoT) is a different development. With the help of IoT, all the physical objects can connect to the internet. And with this we can consider the two layers of the system viz: the sensor device which gathers data and links to cloud and next is the cloud service which hosts the information from the environment. In the storage rooms of industries we need a good environment for the products to be healthy for use. Here we develop a monitoring system with the help of IoT.

The Internet of Things entrance is used as a part of this system. In this strategy we use several access methods such as WiFi, GPRS, Ethernet etc. and also the data collected can be stored. In this IOT

gateway we use ATmega 328 as the Microcontroller unit and μ C/OS-III as the implanted OS. The application authenticates that the entrance is reliable. In this paper we try to develop an arrangement encompassing Arduino wireless sensor networks and cloud and then extend our work to develop a method for the transmission of data between them which can be of great use in monitoring the temperature and humidity. With the help of this monitoring system, the real time detection of the temperature and humidity of the storage rooms can be improved and the longevity of the products can be ensured.

[7]. Kumar Keshamoni, Sabbani Hemnath in "Smart Gas Level Monitoring, Booking & Gas Leakage Detector over IoT" 978-1-5090-1560-3/17 \$31.00 © 2017 IEEE have explains about the most common problem experienced in our day- to- day lives that is regarding GAS container going empty. We bring this paper to create awareness about the reducing weight of the gas in the container, and to place a gas order using IOT.

The gas booking/order is being done with the help IOT and that the continuous weight measurement is done using a load cell which is interfaced with a

Microcontroller (to compare with an ideal value). For ease it is even has been added with an RF TX & Rx modules which will give the same information. When it comes it to security of the kit as well as gas container we have an MQ-2(gas sensor), LM 35(temperature sensor), which will detect the surrounding environment for any chance of error. Whenever any change is subjected in any of the sensors (load cell, LM35, Mq-2) a siren (60db) is triggered.

[8]. Dr. S.W Mohod, Rohit S Deshmukh in "Internet of Things for Industrial Monitoring and Control Applications" have told that Industrial Monitoring and Control is essential to collect all the relevant information, statistics and data related to the various industrial processes, motors, machines and devices employed in industry premises. This aims at controlled access, better productivity and high quality results of industrial products being manufactured.

In this new era of technological developments remote control and monitoring via communication techniques such as ZigBee, RF, Infrared, techniques has been widely used in Industries. However, these wireless communication techniques are generally restricted to simple applications because of their slow

communication speeds, distances and data security.

In addition, they are easily affected by noise and bad weather conditions such as snow, fog and rain. In the Present project, a new solution is adopted for the traditional monitoring and controls of Industrial applications through the implementation of Internet of things (IOT).

PROPOSED SYSTEM

In this proposed system, the main concern is to implement and design a multi sensors based IoT platform for air, sound and water quality real-time monitoring. Main focus of this system is high & fast sensitivity, low cost and low power consumption with two way power system. The system always takes its powered from solar panel unit, if the solar panel fails the AC power line enable automatically, thus the automatically switching system is handling by power electronic logic circuit. After sensing data send to the cloud, data storage operation and Alarming before will pollution become occurs.

Air temperature and relative humidity CO₂, CO, LPG, Smoke, alcohol, benzene, NH₃ Temperature, similarly to pH level, water temperature for water quality and also detect environment sound Dimension are

united this system for real-time monitoring Another consideration in this research based on cost effective sensors for relative humidity, temperature and VOC measuring, pH measuring with MOIST thick sensor was developed [1].This proposed system provides a special advantage where everyone sensor connected with a input pin within a central unit based microcontroller for sensing quality parameters value .

The proposed central unit based microcontroller system ensures that it can be easily expanded, customization and allows customization options as user requirements, simple, accurate result, easily maintenance and cost-effective, E-mailalart and SMS all art before the pollution occurs, If the device are disconnected with cloud, user get a Email alart within 5 minutes .

The proposed system is a platform which allows multi-parameters analysis of air, gas, sound and temperature. So the proposed system offers better efficient and differentiate with existing system .The pollutants when released from industries or when fire is detected the system gets activated. When carbon di oxide goes above the defined level or threshold value the system gives an alarm to the authority.

If the authority does not take any actions system automatically stops the motors.

Similarly when `_re` is detected an alarm is given and if no actions are taken by the authority automatically exhaust fans will get on. The Leaked is detected and after the alarm if no actions are taken the boilers are switched off. This system is also monitored using IOT the internet of things.

Whenever the parameters cross the limits the values are updated. These updated values can be viewed anywhere and anytime by opening the link given through internet. The inputs from sensors given are interfaced with IOT and made available online all the time so anyone who has the

link can view the condition of the parameter. Methodology Description is shown in **Figure 1**.

CONCLUSION

The wireless sensor networks are connected with the internet with the help of the IoT gateway and also ensure the monitoring of the products inside cold store rooms. Also this type of application helps in checking the temperature and humidity on a continuous basis and then resulting instructions are sent to the server. Based on which the environment inside the store rooms can be monitored. This type of system can help in Industrial Automation using IoT, with the help of which we can take intelligent decisions.

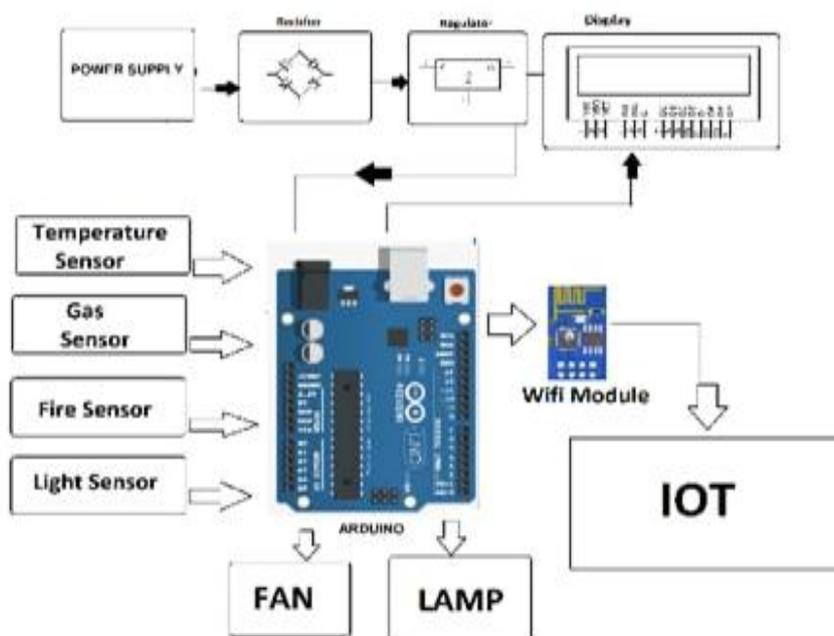


Figure 1: Methodology Description

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