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Implementation of Security System Using IOT

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ABSTRACT: Security playa important role in industry for the safety of employees and avoid accidental losses. Thus, it is necessary to constantly monitor the industrial environment. Today's networking technologies are optimized for Human-to-Human interactions rather than Machine-to-Machine communication. Internet of things (IoT) aims to extend Internet to large number of distributed devices by defining standard interoperable communication protocols. Temperature sensor, Smoke detector is organized in as Wireless sensor networks by RF. To communicate with other system and for data acquisition Raspberry-pi is used because it has its inbuilt wireless module. The functional design and development of the hardware and software architecture of the security monitoring systems proposed in this paper. Sensor is connected in wireless network consisting of spatially distributed and autonomous devices monitor physical or environmental conditions.

KEYWORDS: IOT, Raspberry-pi, Temperature Sensors, Smoke detector Sensors, RF.

1. INTRODUCTION

1.1 Introduction

The Internet of Things (IoT) can be portrayed as interfacing everyday objects like smart-phones, Internet TVs, sensors and actuators to the Internet where the devices are astutely connected together empowering new types of correspondence amongst things and individuals, and between things themselves. Building IoT has progressed altogether over the most recent a long time since it has added another measurement to the universe of data and correspondence innovations. With the rapid development of Internet technology and communications technology, our lives are gradually led into an imaginary space of virtual world. People can talk, work, shopping, keeps pets and plants in the virtual world given by the system. However, human beings live in a real world; human activities cannot be fully implemented through the services in the imaginary space. It is the limitation of imaginary space that restricts the improvement of Internet to give better services. To remove these constraints, another innovation is required to incorporate nonexistent space and certifiable on a same stage which is called as Internet of Things (IoTs). Based on a large number of low-cost sensors and wireless communication, the sensor network technology puts forward new demands to the Internet technology. It will bring huge changes to the future society, change our way of life and business models.

Using internet of things (IoT) to connect things, service, and people for intelligent operations has been discussed and deployed in many industry domains such as smart city, smart energy, healthcare, food and water tracking, logistics and retail, and transportation. However, scarce information is available for IoT usage in industrial automation domain for reliable and collaborative automation with respect to e.g., enabling scalable collaboration between heterogeneous devices and systems, offering predictable and fault-tolerant real-time closed-loop control, and inclusion of intelligent service features from edge devices to the cloud. In this paper, we will clarify the specific security constraints within industrial automation, present specific industrial IoT challenges due to these constraints, and discuss the potentials of utilizing some technical solutions to cope with these challenges. Industrial security today needs to make use of the latest technological components. In this paper I going to present the design and implementation of a remote and sensing, control and security system based on wireless web technology. This system offers a complete, low cost, powerful and user friendly way of 24 hours of real –time monitoring and remote control of a industrial security. In case of fire/security the chip will receive signals from the different sensors in the monitoring place and acts according to the received signal by updatingthe status on web, it also works as automatic and immediate reporting to the user in case of

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emergency for home security, as well as immediate and automatic reporting to the fire brigade and police station according to activated sensor to decrease the time required for tacking action.

1.2 Motivation

Wireless Sensor Networks (WSN) has been used to gather information about physical phenomena in different applications, for example, territory monitoring, and ocean monitoring, and surveillance. As a growing innovation achieved fast advances in present day modern wireless telecommunication, Internet of Things (IoT) has entranced a great deal of consideration and is relied upon to bring advantages to various application ranges including mechanical WSN frameworks, and medicinal services frameworks fabricating. WSN frameworks are appropriate for long haul modern ecological information procurement for IoT portrayal. Sensor interface gadget is basic for distinguishing different sorts of sensor information of modern WSN in IoT conditions. It enables us to get sensor information. Therefore, we can better understand the outside condition data. So as to meet the prerequisites i.e. requirement of long haul mechanical ecological information procurement in the IoT, the acquisition interface device can collect multiple sensor data at the same time, so that more accurate and diverse data information can be collected from industrial WSN. With the improvement in Internet advances and WSNs, another new trend is framing in the period of universality. IoT is all about physical things conversing with each other, where machine-to-machine (M2M) communication and person to- computer communication will be reached out to things. Key technologies that drive the fate of IoT are identified with smart sensor technologies including WSN nanotechnology, and smallness Since IoT is related with extensive number of remote sensor device, it creates a enormous number of information .Sensor information obtaining interface gear is one of the key parts in IoT applications. Information gathering is the essential use of WSN and that's just the beginning critically it is the establishment of other progressed applications in IoT condition. IoT is a noteworthy drive to bolster benefit arrangement with different applications. The design of IoT comprises of three layers:
1) Perception layer;
2) Network layer;
3) Application layer.
The design of information securing interface i.e data acquisition interface is predominantly connected to the recognition layer of IoT. The recognition layer of IoT is essentially made out of sensors, RFID perusers, cameras, M2M terminals, and different information gathering terminals. The information procurement interface is in charge of the combination and coordinated effort of different situations also, gathering of sensor information.

1.3 Relevance

Over 10 years back, the Internet of Things (IoT) paradigm was coined in which computers were able to access information about items and condition without human interaction. It was aimed to complement human-entered information that was viewed as a constraining element to obtaining precision, inescapability and cost. Two innovations were generally viewed as key empowering influences for the IoT worldview: the radio-frequency identification(RFID) and the wireless sensor networks (WSN). While theformer is well established for low-cost identification andtracking, WSNs bring IoT applications richer capabilities forboth sensing and actuation. In fact, WSN solutions already cover an exceptionally expansive scope of uses, and look into and innovation progresses persistently extend their application field. This pattern additionally expands their utilization in IoT applications for flexible ease information securing and incitation.

1.4 Objectives

The objective of the proposed system is given below,
The main objective of this project is to design and implement of a WEB-enabled distributed control application platform for industrial automation.PC based control are the important aspects to be considered for implementing LAN based industrial automation with WEB connectivity to Control unauthorized user for the Industry through biometric camera and buzzer system.
1. To design a smart sensor interface for industrial security system using IoT.

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2. Design a system suitable for real-time and effective requirements of the high-speed data acquisition system in IoT environment.

1.5 Problem statement

Security monitoring framework requires information transmission framework quick accepting information and precise at a specific separation, so clients can place devices freely at important locations for the information show beneficiary. At the end of the day, this framework must be convenient and easy to understand. Display framework is appeared to be clear and straightforward, so that clients can take important immediate action. The system must not be hacked by anyone, no matter in different ways including on input source power, the content of information transmission, substance of getting information and area of security sensor gadget's fundamental processor is put away. The framework should likewise have qualities, for example, water resistant, high temperature resistant and robust, so that information transmission process and information getting won't come up short. A large number of other security frameworks have a few restrictions on the use of sensor gadgets. These issues will result in limitations of the security framework. In any case, it is unavoidable that a security framework requires broad utilization of sensors for the framework to work proficiently and have the capacity to detect objects in every area of the house. The use of sensor devices is also very important in security systems. Sensors must be sensitive to human motion. Sensors must work on the most appropriate range, that is not too close and too distant to detect movement and should be according to the human nature.

II. LITERATURE SURVEY

In literature, the problem and the previous techniques of smart sensor interface for industrial security system in IoTenvironment described by Shifeng Fang et al. presents an incorporated way to deal with water resource management based on geo-informatics including technologies such as Remote Sensing (RS), Geographical Information Systems (GIS), Global Positioning Systems (GPS), Enterprise Information Systems (EIS), and cloud services. This paper too presents a model IIS called WRMEIS i.e. Water Asset Management Enterprise Information System that incorporates capacities, for example, information securing, information administration and sharing, demonstrating, and information administration. This framework gives best administration to water security and surge for human culture which is future for human life. This framework is mix of Snowmelt Surge Forecasting Enterprise Information System i.e. SFFEIS, which depends on the Water Resource Administration Enterprise Information System. This framework contains operational database, Extraction-Transformation Loading (ETL), data stockroom; in which it contains data administration that permits any member assume the part as a sensor and a benefactor to the data distribution center, worldly and spatial examination, reproduction/expectation models to anticipate the air condition, learning administration is helpful for the taking choice; which is given by both clients and open assume the part of giving information and information, and different capacities.

S.Pandikumar and R.S. Vetrivel, presents GSM based outline of smart home controlling framework in IoT Condition. This framework empowers the clients to control and screen savvy gadgets through internet and furthermore it creates an interface amongst clients and savvy home by utilizing GSM what's more, web advances, or it can state that it makes GSM based remote correspondence from the web server into the savvy home. Clients give charges through web then the clients sources of info are changed over into GSM-SMS charges, at that point these summons are sent to embedded system module. This installed framework straightforwardly interface with gadgets through GSM network , lastly the client summons are parsed and executed by microcontroller to control any electronic articles like home machines, lights, and so on and it sends the acknowledgement.

GauravTiwari and RiyazKazi, exhibit Autonomic Shrewd Sensor Interface for Industry in IOT Environment. Sensors are for the most part compelled by the device due to the present connect number, sampling rate, and signal types. In the event that required to associate gadgets required to compose confused and cumbersome information gathering

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programming code. This issue is tackled by outlining the shrewd sensor interface for mechanical WSN in IoT condition, in this field programmable gate array (FPGA) is received as a core-controller.

S. Liet.althis paper introduces an EIS combination plot in cloud administrations. The advances in hybrid wirelessnetworks and cloud computing technologies makes it conceivable to build up a coordinated plan that can flawlessly incorporate these new advances into existing EISs. In this article, by taking the elements of half and half remote systems and distributed computing into thought, they propose a cloud-based administration arranged undertaking data framework, which incorporates frontend layer, center layer, and backend layers associated to IP EISs. In light of a communitarian design, a cloud administrations administration structure and process outline is exhibited. In our future works, we will execute the proposed system over Swan Mesh stage by incorporating the UPnP standard into an enterprise information system.

This paper addresses all phases of the practical developmentfrom scratch of a full custom WSN platform for environmentalmonitoringIoT applications. It starts by analysing the application necessities and characterizing an arrangement of details for the stage. A real-life, requesting application is chosen as reference to direct the vast majority of hub and stage arrangement investigation and the execution choices. All parts of the WSN stage are considered: stage structure, adaptability and reusability, improvement of the sensor also, passage hubs, improvement of the correspondence conventions for both in-field and long range, blunder recuperation from correspondences and hub operation, high accessibility of administration at all levels, application server unwavering quality and the interfacing with IoT applications. Of specific significance are IoT necessities for low cost, fast deployment, and long unattended service time.

Cheong, P. et al. paper presents ultraviolet flame detection with the help of ZigBee based wireless sensor network node for the ultraviolet. In this framework, there is one sensor hub; which comprises of a ZnSSe UV photograph finder, current delicate front end including a high pick up current to voltage speaker with 120 dB and a logarithm converter, a handset worked at a 2.4GHz modern, logical, and medicinal band(ISM). The uninvolved photograph finder is planned or set in a manner that it will have a cut off at 360 nm and framework can identify the fire at the speed of 70 ms for outflow of fire into picoamperes. With this the framework likewise contains blended flag handling for the speed of fire discovery is as quick as 70 ms and ZigBee transmits information from the sensor to the focal processor framework or to the application layer. The power utilization of framework's sensor hub is on a normal of 2.3mW from a 3.3V supply.

Bharani M., Elango S., Ramesh S.M., and Preetilatha R., presents an embedded system based monitoring system for industries by interfacing sensors with ATmega Microcontroller In this paper the different sensors are being utilized for measuring the temperature, weight, gas and so forth. In the proposed framework, sensors are interfaced with the microcontroller ATmega328p which gives a highperformance Atmel 8-bit AVR RISC-based microcontroller joins 32KB blaze memory with readwhile-compose capacities, 1024B EEPROM, 23 general reason I/O lines, 32 broadly useful working registers, three adaptable clock/counters with look at modes, inner what's more, outside interferes with, serial programmable, a byteoriented 2-wire serial interface, serial port, a 6-channel 10- bit A/D, programmable guard dog clock with inner oscillator, and five programming selectable power sparing modes. Utilizing Zigbee the deliberate qualities are sent from checking station to the controlling station and afterward sent through WAN to the Internet if necessary. Gotten qualities are contrasted and the limit esteem if any confound is discovered then the laborers will be educated to take restorative measures.

This paper describes an IOT Based Reconfigurable smart WSN unit for modern security parameters monitoring. The framework can gather sensor information brilliantly. It was composed in view of utilization of remote correspondence. It is exceptionally reasonable for constant and compelling prerequisites of the rapid information obtaining framework in IoT condition. The utilization of ARDUINO UNO significantly streamlines the outline of fringe circuit, and makes the entire framework more adaptable and extensible. Diverse sorts of sensors can be utilized the length of they are

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associated with the framework. Principle outline technique for the reconfigurable savvy sensor interface gadget is portrayed in this paper. At last, by taking industrial safety parameters checking in IoT condition for instance, we confirmed that the framework accomplished great impacts in pragmatic application. All things considered, many fascinating headings are staying for further examines in the range of WSN in IoT environment.

III. SYSTEM ARCHITECTURE

Our system consists of web based monitoring system. A system will monitor the hazardous gases that are emitted by industries across the particular arena. It simultaneously provides data to authority and organization. The main objective of the work is designing microcontroller based toxic gas detecting and alerting system. The hazardous gases emitted due to fire were sensed and display message in LCD. If these gases exceed the normal level then an alarm will get generated immediately and also an alert message is sent to the authorized person through the android application. The advantage of this automated detection and alerting system over the manual method is that it offers quick response time and accurate detection of an emergency and in turns leading faster diffusion of the critical situation.

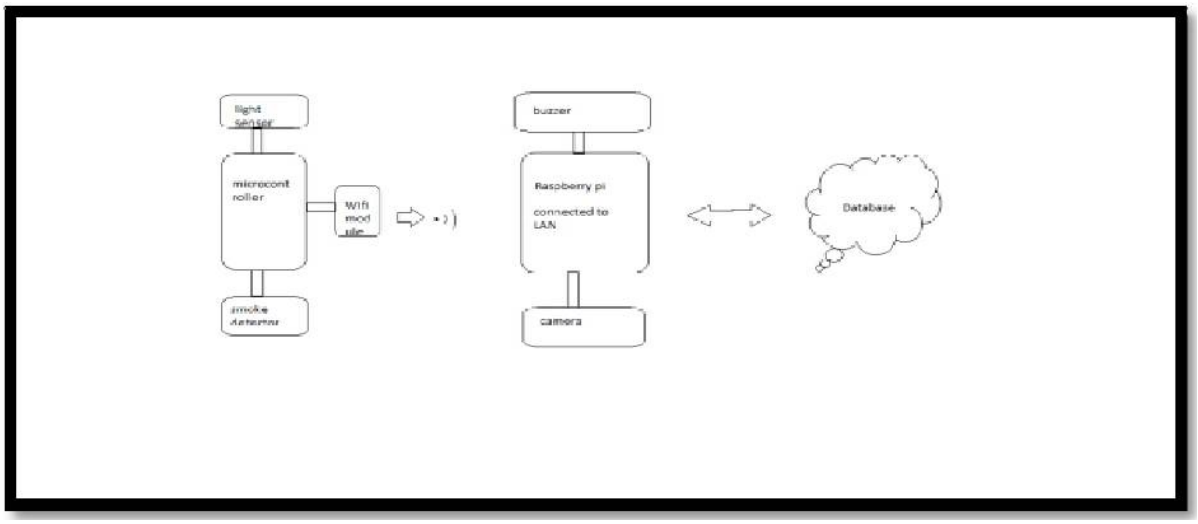

Fig 1: System Architecture

3.1 Advantages

Safety is fully automatic so continuously monitoring is possible.
• Due to face recognitions no chance of intruder passing.
• Data is easily and accurately maintain on server.

It can be implemented to any levels of the security system. The architecture of the system mainly consists of three components the Wifi module and the interface circuit that include the different sensors used. The function of the Wifi module is the remote communication between the WEB and the controller through Wifi module communication with raspberry pi. The function of the controller is to continuously check the inputs coming from the different sensor and send message through the Wifi network in case of emergency. The microcontroller is connected to different devices like smoke detector, temperature sensor through relays. The Wifi connected to the web through the mobile cellular network. An interface circuit has been designed which includes sensors as input devices. Then the programmed microcontroller has been connected to the interface circuit and the Wifi through the serial web server.This figure show

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the overall functionality of the project .In this block diagram there are 3 modules which implement the industrial smart automation system. First is microcontroller system which gets the status from the smoke sensor & temperature sensor. Smoke sensor give the value to the microcontroller continuously this value send to the raspberry pi when thevalue crosses the threshold value the raspberry pi on the buzzer and sends message to the security person. Like this Temperature sensor value is also compared for fire detection, when fire is present then the increased value is send to the microcontroller this is forwarded to raspberry pi to start the buzzer. Second system is Raspberry pi which perform the action according to the microcontroller value as well as the camera images. In this raspberry pi circuit it will capture the image and interact with the web server. When any employee comes in front of the camera then the image is captured & this image is compared with image which is already stored on the web server. When image is matched then the authentication is accessed otherwise unauthorized person indication is given to owner and security authority. Third section is web server in this section the data is maintained & updated by raspberry pi through the wireless communication.

IV. APPLICATION

1) Tsunami Detection System using IoT: The System consists of sensors, satellites, active monitoring system etc. Not only sensors, but also satellites play an important role in IoT. The changes in position of Z-axis are measured by the sensor using GPS. The satellite collects data from the sensor nodes. The data gathered s then sent to the base station via. Wireless networks. At the base station, the waves are analysed and are distinguished as normal and tsunami waves.
2) Intelligent Traffic Monitoring System using IoT: The system uses RFID, wireless sensors like laser sensor, infrared sensor, ad-hoc networking. It enables the drivers to choose optimal paths to reach the destination. The moving vehicles can be monitored, controlled and administrated by the system. Traffic jam can be reduced to a great extent and traffic safety is guaranteed.
3) Waste Management using IoT: An M2M sensor device called Sintelur is driven by the CarriotsIoT platform. The filling level of waste (glass, paper, cardboard, cans, etc.) in the containers is determined by this sensor. Using GPRS, this data is transmitted to the management centre. To better manage the recycling process and improve recycling policies they have dashboards and tools. The pickup service becomes more efficient as it calculates the best routes for collecting the waste which results in reducing costs and CO2 emissions.
4) Vehicular Pollution Monitoring using IoT: The System consists of wireless sensor networks, gas sensors and RFID tagging system. It enables detection of level of air pollution on road. The vehicles which cause pollution over a certain limit are also monitored. RFID tagging systems along with the sensors are used to monitor and control the levels of air pollution anytime, anywhere.
5) Home Automation is a kind of extending building automation. Home automation mainly reduces the human efforts and enhances the facility of our home with improved convenience, ease and security. It adds smartness to the machine learning ideas. Home Automation is becoming popular as the concept of "Internet of things" has paired with it. With the help of internet of things, home automation control controls the home appliances such as control of lighting, air conditioning, heating, home theatre, electric doors and other electronic appliances.
6) Electrical devices of home are combined with each other in home automation system. These devices are connected through a home network to allow control by a Smartphone or tablet with internet access. Through the involvement of information technologies, the home appliances can operate smartly with the help of internet of things which results in convenience, ease, power efficiency, and safety. Also in industrialization, the automation system proves itself a highly intelligence.

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V. CONCLUSION

From the Consideration of all the above focuses we reason that the main objective of this project is to outline and arrangement of a WEB-empowered circulated control application stage for industrial automation. PC based control are the critical perspectives to be considered for executing LAN based industrial automation with WEB network to Control unapproved client for the Industry through biometric camera and ringer system. The framework comprises of electronic checking framework. A framework will screen the unsafe gasses that are radiated by ventures over the specific field. It all the while gives information to specialist and association. The fundamental goal of the work is planning microcontroller based harmful gas identifying and alarming framework. The dangerous gasses discharged because of flame were detected and show message in LCD. In the event that these gasses surpass the ordinary level then a caution will get produced quickly and furthermore a ready message is sent to the approved individual through the android application. The advantage of this automated detection and alerting system over the manual method is that it offers quick response time and accurate detection of an emergency and in turns leading faster diffusion of the critical situation.

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