

The design and implementation of building fire monitoring system using zigbee-wifi gateway

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Abstract - With the rapid development of wireless communication technology, people's life has undergone great changes. In recent years, the comfort and safety of the building environment have become a universal concern. However, building fire is the greatest threat to building safety. In consideration of the current issues on building security, the design applies the important part, the wireless sensor network technology to building fire safety monitoring system and establishes the wireless sensor network by using ZigBee technology and ZigBee-WiFi gateway which transforms ZigBee network into WiFi network. In addition, taking advantage of the ZigBee wireless sensor network locates a fire place so that the fire information is uploaded to the handheld terminal and the building security personnel work out the retreat and rescue plan in time. This paper provides a new solution for building fire monitoring system.

Key Words: Wireless, Fire Monitoring, Zigbee

1. INTRODUCTION

In present day years, wireless communications, wireless control, wireless limitation and versatile advanced innovation turn out increasingly consistently in our everyday life. The remote correspondence development is extensively used as a piece of building motorization, changing the ordinary wired correspondence path in to remote. For the troublesome condition in building, the utilization of remote sensor frameworks to remote places in building has transformed into another example. Show day building fire wellbeing system essentially focuses on the fire caution alarm. At the point when fire mischance happens the observing framework can't take convincing takeoff and heading in time. Exactly when the fire happens, it is particularly basic for people in hazard to escape quickly.

With the quick change of remote correspondence advancement, people's life has encountered startling changes. Presently a day's solace and security of the building condition have transformed into a noteworthy concern. Building fire is the most serious threat to building security. As to show issues on building security, the framework applies the imperative piece of the building, the remote sensor mastermind development to building fire checking and sets up the remote sensor sort out by using ZigBee

advancement and ZigBee-WiFi passage which changes ZigBee orchestrate into Zigbee-WiFi organize, besides, misuse the ZigBee remote sensor put all together finds a fireplace so the fire data is exchange to the handheld terminal and the building security staff work out the pull back and ensure orchestrate in time. This paper gives another response for building fire checking structure

Counting that, building fire observing framework outlines, the long separation transmission strategy for flame information inside the entire working by ZigBee-WiFi door framework by associating more than one Zigbee modules, and after that the fire signals distinguished by sensors are transmitted to the checking focus and furthermore hand held gadget by Zigbee-WiFi arrange, which interfaces with singular terminal easily. Basic leadership focus require examining the unsafe circumstance and the advancement technique for flame rapidly and adequately. By then the examination ought to be done on the correct level of chimneys and extent of the mishap, and check the quantity of human lives and their areas to pick the right arrangement. Besides, the building fire observing framework is a constant and it can screen the sides of the building where fire mishap can happen. The plan can give ensure for the security of building and people totally and suitably.

OBJECTIVES

- Concentrates on the issue of building fire monitor,
- It uses wireless sensor node organize,
- It mainly focuses on the temperature, flame and smoke.
- Taking full focus of ZigBee-WiFi arrange.
- The design is a real-time building fire monitor system.

II.LITERATURE SURVEY

The literature survey is extremely necessary for any project progress, addition to that, the project from old models to new models. Well coming of innovative technologies and upgrading of recent technologies without troubling its application right from the start with rising of its overall performances.

Multi parameter Fire Detection based on Wireless Sensor Network [1] Remote chimney hubs in light of Wireless

sensor framework is laid out which can recognize temperature, and mugginess, and smoke obsession. The piece of flares deception is diminish among multi parameter incident strategy. A most limited way directing calculation was acquainted agreeing with multihop correspondence utilizing on CSMA/CA standard. The sensor hubs have the capacity to associate every one naturally and the sensor data can be transmit inside minimum measure of bounces, so it's a continuous fire screen framework is develop.

Fire Monitoring System using ZigBee Wireless Network [2] in the work, a kind of low power, multi-parameter blend fire ID center is delineated, which can distinguish temperature, smoke obsession and CO gas center. Moreover, joining with the WSN (remote sensor arrange), a constant remote fire checking system is set up. This system is associated in fire recognizable proof of outstanding condition addressed by the old structures. The gear and programming usage relies upon 2.4GHz remote correspondence chip CC2430. ZigBee tradition is grasped in the structure to shape strong remote correspondence.

Fire Accident prevention method in Trains Using GSM Technology [3] as of now, flares mischances are occurring regularly out in the open transportation framework which cause the disappointment of the lion's share valuable human lives and government assets. There is various strategies to avoid fire mischance and to diminish the brutality of misfortune at the time fire mishap out in the open transportation framework. However the harm is tragic as a spare administration can't reach at remedy occurrence because of wrong correspondence.

Room Temperature supervise and Fire Alarm/control IoT Service based MQTT on AWS [4] In this paper we make a MQTT(Message Queue Telemetry Transportation) agent on Amazon Web Service(AWS). The MQTT merchant has been utilized as a phase to give the Internet of Things (IoT) organizations which screen and control room temperatures, and sense, alert, and cover fire. Arduino was used as the IoT end instrument interfacing sensors and actuators to the phase by methods for Wi-Fi channel. We made splendid home circumstance and formed IoT satisfying the circumstance must. We moreover executed the splendid some structure in hardware and programming, and affirmed the system operation. We show that MQTT and AWS is awesome specific contender for little IoT business applications.

III. METHODOLOGY

BUIDING FIRE MONITORING SYSTEM

Fire Detecting node, Monitoring node, and remote unit (hand held terminal) are the three main parameter that have been utilized here. As appeared in figure 1, these three hubs form a set of connections. Detecting node consistently detects and

stores the adjustments in the temperature and the quantity of gatecrashers. This information is sent to the monitoring node using Zigbee-WiFi control and handheld terminal that is extinguishing terminal using gsm. When fire accidents happens the temperature crosses the certain threshold, then the detecting node will send the fire information to monitoring centre and remote unit At the time the fire alarm will be on and temperature, fire range, and smoke value will be displayed on the monitoring centre and text message is sent along with call to remote unit by using gsm. Then the remote unit and monitoring centre will take further action to decrease the fire.

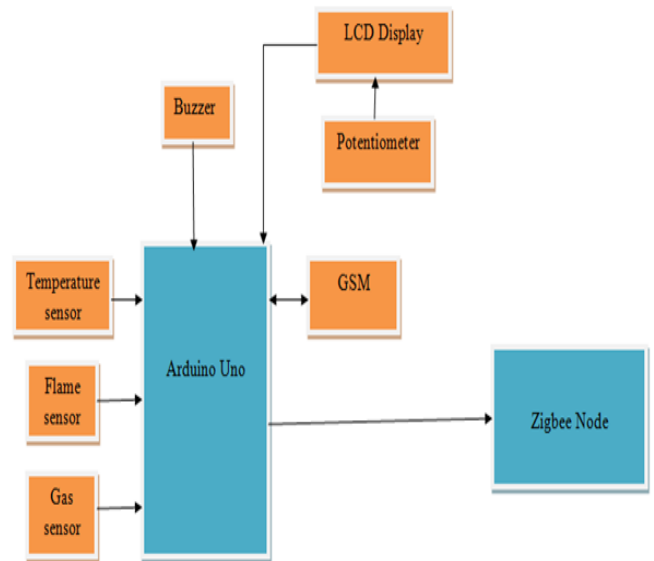


Fig 1: Detecting Node

MONITORING NODE

It collects the sensor information from the detecting node by using Zigbee-WiFi gateway. The sensor values is sent from the Zigbee, Zigbee-WiFi gateway is connected personal computer to display the sensor values if it is fire is detected and it crosses the threshold it display the message fire is detected and if not fire is not detected, the distance between Zigbee and Zigbee -WiFi gateway is 100 meter like that we can connect more than one Zigbee-WiFi gateways to cover the entire building.

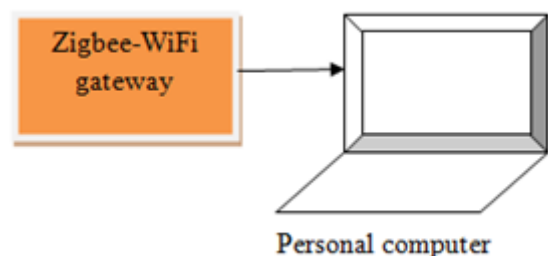


Fig 2: Monitoring node

REMOTE UNIT

In this hub (node) we have hand held terminal that is phone and also we can use any other portable devices when flame is detected the detecting node is sent the text message to phone by using GSM, some time people won't see the text messages at the time call is connected to same phone, but this is automated call from the GSM Here the REMOTE UNIT used as a FIRE ENGINE OFFICE.

IV RESULT

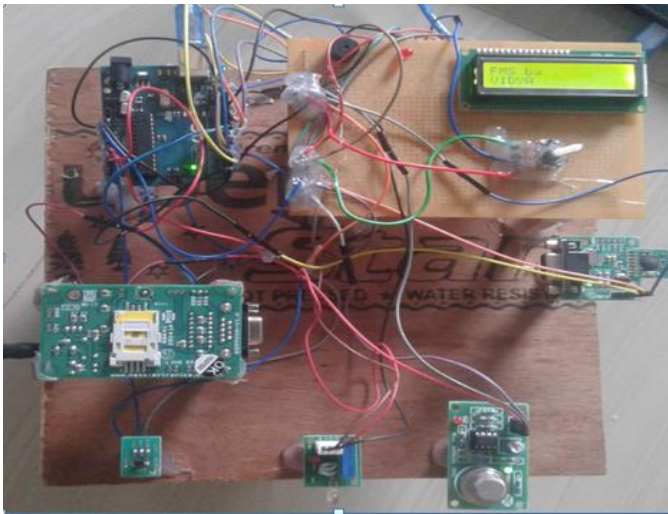


Fig 3: proposed system

When building fire monitoring system is powered on "FMS by VIDYA" and "FMS Initialized" displayed on the LCD and message will be sent to remote module and all sensor values is displayed on the detecting node and monitoring centre along with "NO FIRE DETECTED".

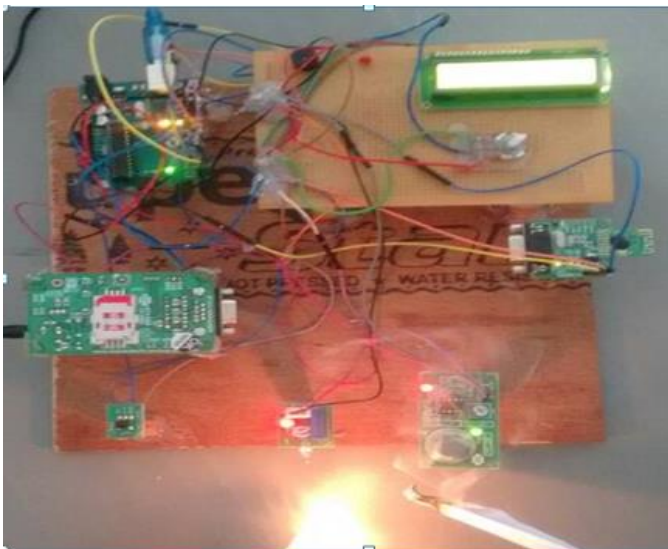


Fig.6.3: detecting fire

If fire is detected and it exceeds the threshold then the message will sent to both monitoring and remote module.

V CONCLUSIONS

This outline concentrates on the issue on building fire checking, consolidated with thought of remote sensor Network innovation, and thinks of a ZigBee-based remote sensor system to gather the data from the sensors and making utilization of ZigBee hubs to find the fire. Taking full focal points of the ZigBee-WiFi organize. The proposed technique is confirmed to be very gainful for the security reason and mechanical reason. What's more, it is an ongoing building fire checking framework which is more facilitative to contact with the individual convenient terminal and has more extensive scope extend.

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