

Fire Detection & Various Alert Systems

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Abstract- In this paper, basically a wide comparison is made between 3 modules of fire detection and alert system. Fire is the major cause of accident resulting in the loss of lives and properties. Various authors have suggested and prepared their prototypes to help the society in premature detection of fire.

Keywords- Internet of Things (I.O.T), Industrial Chemical Hazards, GSM SMS, wireless sensor network.

I. INTRODUCTION

Nowadays, securing one's property and business from fire hazards, has become one of the most crucial aspects of any construction. Various ideas have been proposed and implemented too. But each one of them has certain merits as well as demerits over one and another. This opens a wide range of fire detection modules which may vary in their cost, range, response timing and many other factors. With professional industry making products that have a sky rocketing market price, various students and professors have started researching and development on this problem and have found tremendous success too.

II. IDENTIFY, RESEARCH & COLLECT IDEAS

The Module about to be discussed here are from:

Module No.1: Saumya Tiwari ,and Shuvabrata Bandopadhaya
(IoT Based Fire Alarm and Monitoring System)

Module No.2: Lei Zhang , and Gaofeng Wang
(Design and Implementation of Automatic Fire Alarm System based on Wireless Sensor Networks)

Module No.3: Kausik Sen , Jeet Sarkar , Sutapa Saha , Anukrishna Roy , Dipsetu Dey , Sumit Baitalik , and Chandra Sekhar Nandi
(Automated Fire Detection and Controlling System)

III. COMPARISION

The factors on which the projects of these authors will be compared in-order of find the most reliable mechanism are as follows:

1. Cost
2. Methodology
3. Complexity
4. Connectivity, and
5. Safety

1. Cost- Module No.1 makes the use of Intel Galileo Gen-2, LM 35 temperature sensor, Gas Sensor MQ02 and GSM networks. This definitely brings a spike to the budget. Module No.2 the author has mostly focused on developing a network surveillance system with the use of locally available fire sensors. The setup of a local are network for the entire industry just for fire detection is definitely an expensive task. Module No. 3 uses the traditionally available low-cost hardware in the market and implementing it with a modern methodology. This will definitely cut-short the prices but the reliability of the system is to be questioned.

2. Methodology- Module No. 1 is done through I.O.T platform through GSM Network. This system consists of two sub-systems: The Transmit (Tx) subsystem and the Receive (Rx) subsystem. In Tx subsystem, sensors collects the information of physical quantity and sends it to Tx process unit. The Tx process unit consists of Intel Galileo board which has Intel Quark Core processor. The information is send to far-away Rx subsystem through GSM. In Rx subsystem, the Rx process unit is connected with actuators.

Module No.2, an automatic fire alarm system based on wireless sensor networks is designed and developed with emphasis on the network architecture and communication protocol. Prototype system tests show that the system provides early extinguishing of a fire disaster so that damages will be reduced effectively.

Module No.3, an automatic fire alert and fire distinguishing system by sensing smoke and heat. Something which the above two modules fails to recognize. Also with the

inculcation of the 6bits memory unit leads to the precise direction to the spawn of fire.

3. Complexity- Module No.1 is based on IoT which simply indicates less complexity in the design but more complexity in the coding aspect. Module No.2 emphasis more on the network, which requires a complex network in order to serve its purpose. Finally, module No.3 consists of alot of connection with a simple interface.

4. Connectivity- Implementation of IoT helps faster transmission of signals. But with the failure of Internet, Module No.1 cannot stand on its own. As mentioned for module no.2 special care has been taken in the aspect of connectivity. In Module No.3 moderate connectivity speed can be expected due to the intense connection.

5. Safety- When it comes to safety is the one factor for which people buy the product. Module No. 1 using the modern technology of IoT connectivity can be trusted under a highly working internet environment. Module No. 2 with is highly specialised network work-station can be trusted for connectivity. Module No. 3 with is simple interface and installation cannot be trusted for an early detection because of the addition of the smoke detector.

IV. PIECHART ANALYSIS

A pie chart analysis report has been created for the better understanding of the percentage of the factors (Cost, Methodology, Complexity, Connectivity & Safety) for all the 3 modules. This will help one to buy the product according to their compatibility.

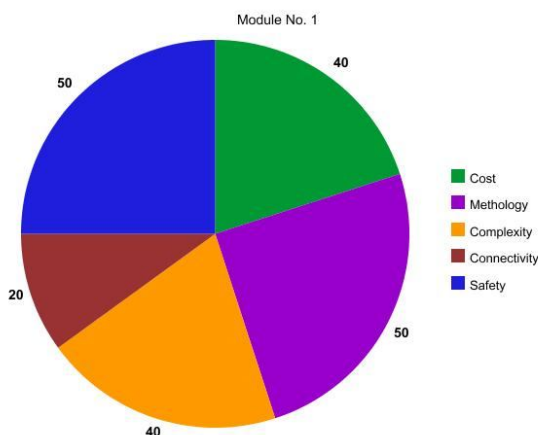


fig: Module No.1 Analysis report.

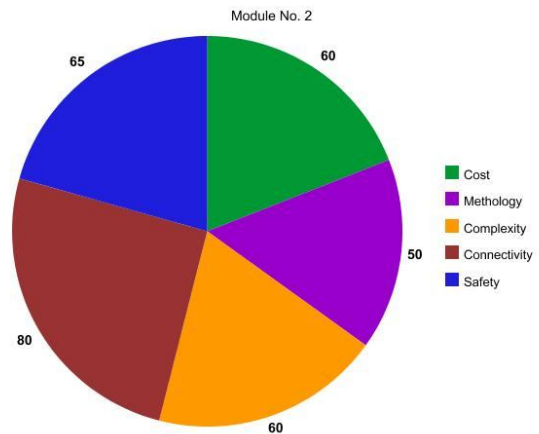


fig: Module No.2 Analysis report.

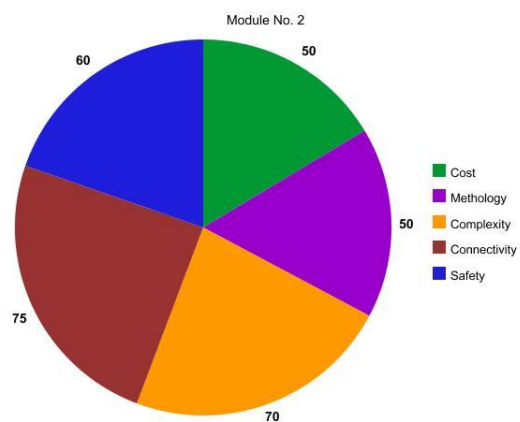


fig: Module No.3 Analysis report.

V. CONCLUSION

With the detailed analysis of all the 3 modules, we come to conclusion that none of the module is compatible with all the working environment. One must choose the fire alerting system according to their own needs and the surrounding environment. Some specific application of the modules can be deduced as follows:

1. Module No.1 is compatible for household and single floor office areas.
2. Module No. 2 is compatible for big industrial area with lots of open space to cover.
3. Module No. 3 is compatible for a building/apartment sort of structure as it gives a particular information about the site of fire.

VI. ACKNOWLEDGEMENT

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