

**Faculty of Graduate Studies**

**Department of Computer Science**

**CS 890EP: Internet of Things and Wireless Sensor Networks Course**

**Project Proposal for**

## **SFAS: Smart Fire Alarm System**

**Prepared By**

**Urvish Rana (200440425)**

**Under guidance from**

**Dr. Maher Elshakankiri**

**Department of Computer Science**

**University of Regina**

**3737 Wascana Parkway, Regina, SK S4S 0A2**

# **Introduction**

IoT is acronym for Internet of things. It is network of smart devices, which are collect the physical data from the environment for controlling, monitoring and analytics purpose.

Kevin Ashton coined the term “Internet of Things” in Presentation of Proctor & Gamble in 1999. – (Sinha, 2019)

In the IoT the basic concept of “Thing” that can be any sensors or actuators, an electronics device that can collect the data and transfer it via the internet using embedded technologies.

The data will use in controlling or analytics through which insight can be gathered and used for future decision-making purpose.

Over the years, the different organizations has developed the architecture of IoT. Those contains different sublayers of IoT. Every architecture added/modified different layers to overcome the industry challenge.

(David Hanes, 2017), suggested a simple IoT reference architecture which has all the basic components required to build a fully fledge IoT solution. The Figure 1 explain the architecture presented in the book

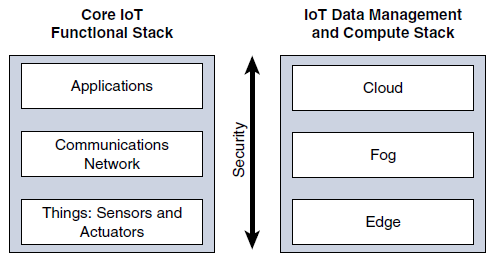


Figure Simplified IoT Architecture from IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things

As the architecture suggest there are three layer in IoT: Things, Communication Networks and Application and the data will pass through all the layer of IoT architecture.

# **Introduction of IoT in Public Safety**

Safety is major factor in each part of our life. There are certain steps that are need to complete for the safety for everyone in life threating events. Through Internet of things, we can develop solutions that can play a vital role in the safety of human lives and in general all the organism.

Internet of things can be used for to develop solutions which can be minimize the time of response from the safety authorities in-order to save maximum lives as much as possible.

A series of smart sensor can work with each other to prevent and report the life threating disasters such as fire, earthquakes, tsunami, cyclone, flood and nuclear power plant explosion.

Using IoT, we can minimize and in some case prevent these disasters. Data gathered by IoT sensor can provide better insight and we can predict the next possible disaster and take the steps to prevent the disaster. Using smart sensor we can capture the data continuously that are very hard to capture manually. Using smart sensor we can also control the remote areas where it is not feasible to operate. Some intelligent sensor can take decision on their own in certain critical situations.

By embedding smart sensors into the power plants and factories, we can easily identify the malfunctioning components, which endangers the safety of workers. Using IoT, we can deploy smart building solutions that can prevent the disasters such as fire on very early stages or even guide people to exit safely to nearest exit.

# **Project Introduction**

**SFAS: Smart Fire Alarm System** is IoT enabled smart sensors network which main purpose is to detect the fire and warns the user about the fire location and area to avoid while exiting building.

In this system series of smart sensors are equipped with gas sensors, LED lights which detects the presence of the gas particularly CO and Air pollutant that are harmful for breathing and are present when there is fire in building. The LED will indicate the safe path to nearest exit. The main function of this system is to detect the fire presence and notified user about the fire location.

There are traditional system present for fire detection and notifying user but the main disadvantage for that system is that it does not given any idea about the location of fire and also cannot help user to navigate to the nearest exit. To overcome above-mentioned disadvantage we can use IoT to overcome the problem.

The System uses Libelium Waspmote devices. These waspmote devices will connect to the Gas sensors. The gas sensors detects the presence of the gas indicating the presence of fire. These waspmotes will connect to a gateway. Gateway gathers the information from each node and get the detailed location of possible fire. Then LED light will change the color of red or green based on the business logic and can guide user to exit the building. Since, these all devices are interconnected and connected to Internet, user can also be notified remotely so that they can avoid the location of fire while exiting building or premises.

**References**

David Hanes, G. S. (2017). *IoT Fundamentals:Network Technologies, Protocols, and Use Cases for Internet of Things.* Indianapolis: Cisco Press.

Sinha, S. (2019, May 22). *Introduction to Internet of Things: IoT Tutorial with IoT Application*. Retrieved from edureka: https://www.edureka.co/blog/iot-tutorial/