

Internet of Things and its Application: Survey

Padma M ¹, Geetha S ²

¹Research Scholar, Department of Computer Science, Muthurangam Government Arts College, Vellore,

²Assistant Professor, Department of Computer Science, Muthurangam Government Arts College, Vellore,

Abstract: Internet of Things (IoT) is widely used connect anything to anything like sensor, mobile application, microcontroller and others. IoT is a dynamic network for self-deployed environment with global access, it has both physical and virtual attributes of any interface which are connected with Internet. In 2013, an infrastructure of the information society called Global Standards Initiative on Internet of Things (GSIIoT). The field of embedded system which deploys with wireless sensor networks are connected with IoT. IoT is built capable of run on the mobile and desktop platform. IoT in the embedded platform are deployed using various cloud protocol like BLE (Bluetooth Low Energy), MQTT (Message Queue Telemetry Transport), etc., MQTT is most commonly used protocol for the IoT level communication which handles data as subscription and publishing the information packets. With help of the IoT, any physical devices can communicate to any other device. With this we can turn any existing system into intelligent system.

Keyword: IoT, Embedded, BLE, MQTT.

I. Introduction

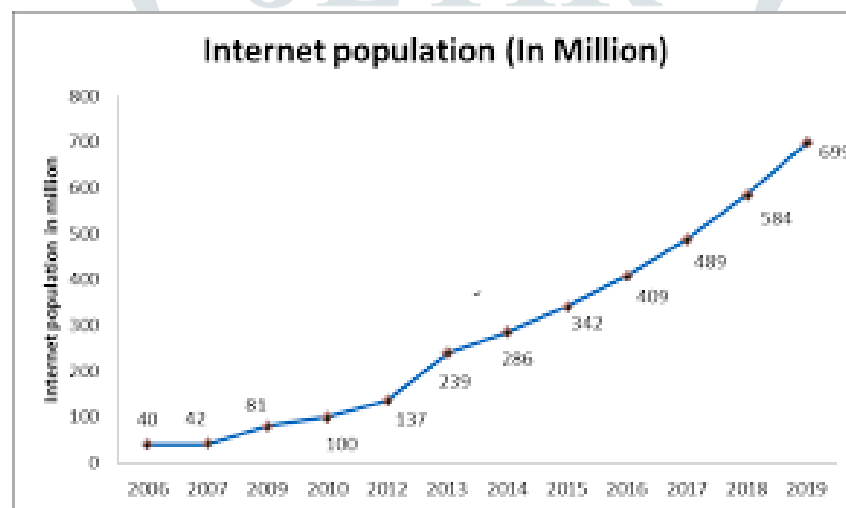


Fig 1. Internet Population [13]

As technology grows, Internet becomes the essential components of every man day-to-day life. Internet is popular among the user because of the accessibility and flexibility among the user. Internet is evolving its forms every day, and its taking its ultimate form of Internet of Things. Internet of Things (IoT) is an emerging technology for the field of communication between the different things and device. At year 2020 the growth of internet is going to increase is rapid range with estimated 7.3 billion tablets, PC and smartphones, and its likely to expand at even more rapid 20 billion. World looking for IoT solutions for every problem its facing, as there compatible and easy to use, as almost everyone in the planet is connected with internet. Internet of things will be the perfect solution for the common problem.

II. Literature Survey

a. Wireless Irrigation and Monitoring system using ZigBee and IoT [1]

Irrigation is the back bone of India but automation in irrigation is not yet existed, this paper proposes a new automated embedded technology for multiple type crop cultivation in a single farm, automatic watering based on moisture level sensor and fire sensing and intimation using IoT. The gas sensor analyses the usage of hazardous manure, the PIR sensor senses the unknown person and animal movement, the database will be maintained in PC. This proposal will help us to eliminate wastage of power, water and to rescue the crops from fire immediately.

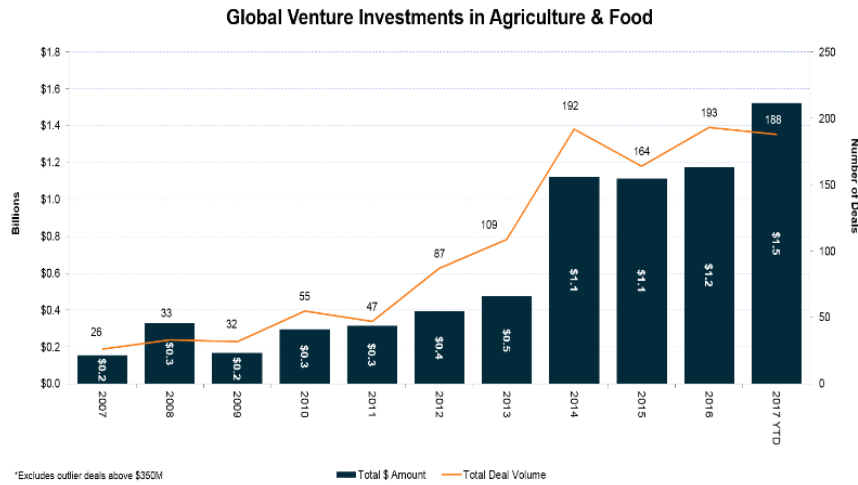


Fig2. Investments in Agriculture [14]

Here we are using microcontroller, Soil moisture sensor, Temperature sensor and Zigbee. The soil moisture sensor senses the moisture of soil, if it crosses the threshold level then it will be intimated using buzzer and notified via IoT. The Temperature sensor senses the temperature level of the atmosphere and if any abnormality on this reading it will notified. Zigbee used to notify the local hub of the farmer. This similar concept are implement and technique involved in the system are are deployed SIM link GSM module and its configured with IoT, with this all the sensor node are interlinked using IoT [7]. Internet of Things(IoT) cannot be restricted to the agriculture field alone, it can be extended to the factory level automation. Factory process of the agriculture process are monitored where conveyer belt, miller, grinder and other equipment are automated using IoT [8]. And this entire system is processed with backup database to record the entire operation.

Challenge: It is having very less parameter to notify and this will not sufficient for monitoring the field status.

Existing System	Proposed System
It is having very less parameter to notify and this will not sufficient for monitoring the field status.	In our proposed model we are deploying moisture sensor, temperature sensor, Gas sensor, PIR (motion) sensor and fire sensor to monitor and safeguard the field.

b. Smart Threat Alert and Tracking system for Women using IoT. [2]

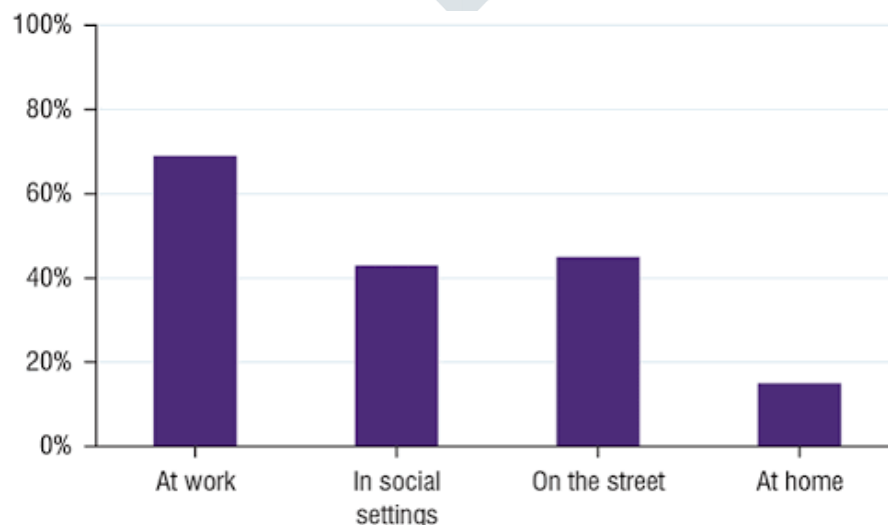


Fig 3. Harassment level faced by Women in different environment [15]

Harassment of women is increasing every day and their safety is the important thing to consider. And solution for this problem is achieved through IoT, and we are also measuring the heart beat rates, temperature and motion sensor. This project describes about safe and secured electronic system for women which comprises of microcontroller and sensors such as Temperature sensor, Pulse rate sensor, motion sensor, IoT and GPS are used in this project. It is used to detect the location of women, whenever their caretaker got afraid of their status. Pulse sensor senses the abnormality in the pulse rate, motion sensor senses the women's angle of tilt indicating the accident or fell down angle, once this sensor detected any abnormality GPS location will be shared with caretaker with alert message. Similarly, for the women safety system Smart Solution For Women Safety Using IoT ^[10] is using technology like Raspberry Pi, Arduino with Heartbeat sensor, Tilt Sensor, Vibration sensor which makes system more costlier as they involve Raspberry Pi. And we are using Tilt sensor used in the paper instead of the motion sensor used in the system.

Challenge: The location of the women is shared to caretaker even its not requirement, this will be violation of their privacy. System should be activated in instant, but is continuously working even situation is not raise and this will drain the charge of the module. Instead of motion sensor, we have to tilt sensor to improve the efficiency.

Existing System	Proposed System
The location of the women is shared to caretaker even its not requirement, this will be violation of their privacy. System should be activated in instant, but is continuously working even situation is not raise and this will drain the charge of the module. Instead of motion sensor, we have to tilt sensor to improve the efficiency.	To protect the privacy of the women, a touch sensor is used. On the touch of the sensor only the location of the women is shared with caretaker. With this privacy of the user is protected.

c. Smart Waste Collection as a Service using IoT- solution for Smart Cities. ^[3]

In the present day situation, commonly we see that the rubbish canisters or dust receptacle are put at open pits. In the urban communities, these waste are flooding in those open pits or dust bins because of increase in population. It makes unhygienic condition for the individuals living around those dust bins/dump yards and their life is at greater risk of hazards caused by this dump yard. To maintain a strategic distance from such a circumstance we are wanting to outline "IoT Based Waste Management for Smart Cities". In this proposed framework we insert a gadget at various dustbins situated all through the city which helps in following the level of the junk present in the containers and each bin is provided with ID to identify. This is bin are identified using RFID technology for short range of communication. When the bin is full, the device will transmit the level alongside the unique ID to central hub. In this proposed system the waste bin is monitored using microcontroller. The level sensor is present in the bin. The level sensor is used to monitor the level height of the waste present in the waste bin. The sensor voltage gets converted into particular digital value and the values are updated in cloud and intimated using the buzzer. The data are updated to the municipality office.

Challenge: RFID system is not required, in this system. This makes the system more complex and increase difficulties in process. As cooperation person has to tag in every time he uses unloading the dump.

Existing System	Proposed System
RFID system is not required, in this system. This makes the system more complex and increase difficulties in process. As cooperation person has to tag in every time he uses unloading the dump.	In this system, Infra-red sensor is used to find different level of dumps in the corporation bin and each bin is assigned with unique ID.

d. Recent Advances in IoT based Wireless sensors for Cattle Health Management – A review. [4]

This paper deals with health monitoring of cattle, it is very helpful for the case of large cattle farms. As the cattle industry is important economy base for the organic industry, automation is highly is required. And our proposed system uses the trending technology like IoT in communicating health stats of each cattle with specific ID. In this system, we are going to monitor health condition of endangered species remotely with less power. The Temperature sensor, Accelerometer sensor and microphone are used monitor the health status of a cattle. Whenever any parameter is gone to an abnormal level then controller automatically sends the information via IoT module. For android app, alert will be in the form app notification.

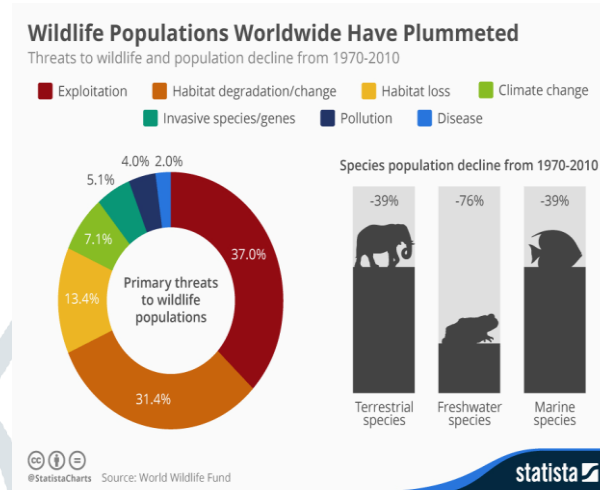


Fig 4. Wildlife Population Chart [16]

Challenge: We are going to implement the improvised system for tracking the location and monitoring the health of endangered species. In this method we are going to deploy the heart beat rate tracking technique using Continuous Heart Rate Monitoring System as an IoT edge device [9]. Here we are will deploying the optical based heart beat sensor which needs to be in contact with skin of the user. So its highly efficient in tracking heartbeat of endangered species.

Existing System	Proposed System
This system involves monitoring body status like temperature using Internet of Things(IoT).	We are going to implement the improvised system for tracking the location and monitoring the health of endangered species. Health stats like Heart beat is monitored.

e. The Survey on IoT Based Home Automation [5]

A system for controlling the residence’s environment by a person with limited mobility and hand function is described with detailed analysis of design alternatives. The proposed system uses internet as a communication medium between android mobile and the devices. NodeMCU executes command received from the mobile through Wi-Fi. The user can give voice input from the mobile to turn the devices ON or OFF. Android app will be used to control the home appliance using NodeMCU. This similar automation technique is deployed in office building for the safety purpose that was described in the Efficient Sensor BIG Data Collection-Processing and Analysis in Smart Buildings [8].

Challenge: In this we improvising the system by deploying voice command as control center and various environment stats are monitored via IoT.

Existing System	Proposed System
In this system by using Keypad with LCD display or Touchscreen or UI based on Smart Phone are used to monitor the status.	In this we improvising the system by deploying voice command as control center and various environment stats are monitored via IoT.

III. Conclusion

Internet of Things (IoT) found its application in various domain like agriculture, automation, tracking, safety, health, machine learning and more. This technology helps to improve our life in greater extent. With the IoT deployed system, we can convert any application to smart application and increase their range to greater extent. IoT is an incredible application oriented platform, which can accommodate and provide a solution to almost all the domain. With help of IoT more realistic solution approach can be provided for any kind of problem that we face in everyday life. From the home automation to women safety, IoT can turn up the world upside down.

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