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IoT Based Child Safety System

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ABSTRACT: Nowadays, child safety is a prime issue of our society. The count of the victim is increasing day by day. In this paper, we are proposing a model which will help to ensure the safety of child all over the global. We have used different sensors like heartbeat sensor, temperature sensor, and accelerometer sensor for detecting heartbeat, temperature and sudden change in motion of user. We have also used GPS which will help to detect location of the device. IOT used in the model is used to send alert message to guardians, relatives and police station. We have proposed IoT (internet of things) based device which will help to continuously monitor values of different sensors and GPS used in device.

KEYWORDS – GPS, location, Sensors, Internet of Things, Security

I. INTRODUCTION

Internet of Things (IoT) plays a major role in every day to day life. The major difference between IoT and embedded system is that a dedicated protocol/software is embedded in the chip in case of embedded system, whereas, IoT devices are smart devices, which are able to take decisions by sensing the environment around the device. The development of sensors technology, availability of internet connected devices; data analysis algorithms make IoT devices to act smart in emergency situations without human interventions. So, IoT devices are applied in different fields such as agriculture, medical, industrial, security and communication applications. IoT systems are useful within a system to do deeper automation, analysis, and integration. IoT contributes to technology by advances in software, hardware and modern tools. It even uses existing and upcoming technology in the fields of sensing, networking and robotics. IoT brings global changes by its advanced elements in the social, economic, and political impact of the users.

Child and women safety is a challenging problem nowadays due to antisocial elements in the society. The crime rate is day by day increasing. Schools and working places need high surveillance for ensuring the safety among children and women. Smart phones are playing major role for ensuring the safety, where some mobile based applications provide alert systems. During the emergency, mobile apps alert the control room of nearby police station or caretakers of children. The literature shows that location tracking devices are available in the market, but it does not provide the complete solution to the problem. The solution to this problem is to design an IoT device, which senses the child's location and environment and during emergency, it should send the alert to the parents automatically.

II. RELATED WORKS

Nikhil Kedia entitled "Water Quality Monitoring for Rural Areas-A Sensor Cloud Based Economical Project"Published in 2015 1st International Conference on Next Generation Computing Technologies (NGCT-2015) Dehradun, India. This paper highlights the whole water quality monitoring methods, sensors, embedded design, and knowledge dissipation procedure, role of state, network operator and villagers in ensuring proper information dissipation. It also explores the Sensor Cloud domain. While automatically improving the water quality isn't feasible at this now, efficient use of technology and economic practices can help improve water quality and awareness among people [5].

Jayti Bhatt,Jignesh Patoliya entitled "Real Time Water Quality Monitoring System".This paper describes to form the safe supply of beverage the quality should be monitored in real time for that purpose new approach IOT (Internet of Things) based water quality monitoring has been proposed. In this paper, we present the planning of IOT based water quality monitoring system that monitor the standard of water in real time. This system consists some sensors which measure the water quality parameter like pH, turbidity, conductivity, dissolved oxygen, temperature. The measured values from the sensors are processed by microcontroller and these processed values are transmitted remotely to the core controller that's raspberry pi using Zigbee protocol. Finally, sensors data can view on internet browser application using cloud computing [6].

Zhanwei Sun,Chi Harold Li,Chatschik Bisdikian,Joel W.Branch and Bo Yang entitled "QOI-Aware Energy Management in Internet-of-Things Sensory Environments". In this paper an efficient energy management frame work to

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provide satisfactory QOI experience in IOT sensory environments is studied. Contrary to past efforts, it's transparent and compatible to lower protocols in use, and preserving energy-efficiency within the end of the day without sacrificing any attained QOI levels Energy management decision is formed dynamically at runtime, because the optimum for long-term traffic statistics under the constraint of the service delay. Finally, an extensive case study based on utilizing the sensor networks to perform water level monitoring is given to demonstrate the ideas and algorithms proposed in this paper, and a simulation is made to show the performance of the proposed algorithms [7].

Nivit Yadav, "CPCB Real Time Water Quality Monitoring & Maintenance" In this method the quality of water in Ganges and Yamuna river is tested by using temperance sensors, co2 sensor, turbidity sensor, rf module, fpga board.since they are the most polluted river in our country CPCB plans for analysing the water standards. And this method is more expensive [8].

Tuan Le Dinh, Wen Hu, Pavan Sikka, Peter Corke, L. Overs, Stephen Brosman, "Design and Deployment of a Remote Robust Sensor" which gives a brief explain about the specialities and designing's of sensors [9].

Quio Tie-Zhn briefed the quality monitoring system based on GPRS/GSM. Then it using ultrasonic sensor, co2 sensor, digital thermometer sensor arduino micro control module, ph sensor, co2 sensor then collects and sends the data to monitoring centre through GPRS. It is an artificial method collection of data and other process will be done slowly [10].

Liang Hu, Feng Wang, et al Jin Zhou and Kuo Zhao [9] "A Survey from the Perspective of Evolutionary Process in the Internet of Things", in this the new arrival and evolution in the internet is made clear to use the internet of things and the different techniques were explained.[11]

M N Barabde, the System is used for determining the physiochemical factors of water quality such as motion, temperature, ph, Digital Thermometer Sensor,co2 sensor, conductivity, and oxidation lowering potential using ZigBee.[12]. Bhad Vidya et al.Has proposed a system which monitors the water level periodically. They designed a zigbee network which has lower energy and real time behaviour. It helps to wireless sensor network to send the notification message to the mobile application user and digital notification board. A microcontroller, water level sensor and a pair of Raspberry pi and DAS have been used to design the system. The Sensor want to detect the water level, then the info attend transmit and receive through the Raspberry pi and therefore the whole procedure is then control by this unit.[13]

III. PROPOSED WORK

The IOT can be used in practically all scenarios for public services by governments. Sensor-enabled devices can help monitor the environmental impact of cities, collect details about sewers, water quality, and garbage. Such devices can also help monitor woods, rivers, lakes, and oceans. Many environmental trends are so complex, that they are difficult to conceptualize. The Internet of Things (IOT) is a recent communication paradigm that envisions a near future, in which the objects of everyday life will be equipped with microcontrollers, transceivers for digital communication, and suitable protocol stacks that will make them able to communicate with one another and with the users, becoming an integral part of the Internet. An urban IoT can provide means to monitor the quality of the water in crowded areas, parks, or fitness trails. The realization of such a service requires that water quality and pollution sensors be deployed across the city and that the sensor data be made publicly available to citizens.

The smart WQM system, the ultrasonic sensor (LV-MaxSonar-EZ1) is chosen to monitor the water level. This ultrasonic sensor is operated by emitting high-frequency sonic wave at regular time interval ranging from the from the front of the transducer. The sonic waves are reflected by an object and received back within the transducer. The time interval between emitting and receiving sound waves is proportional to the distance between the transducer and the object can be calculated. As the ultrasonic sensor is using sound wave instead of light w5ave, it is more suitable for sensing uneven surface such as water surface.

According to its datasheet, the ultrasonic sensor detects objects from 0-inches to 254-inches (6.45-meters) and provides sonar range information from 6-inches bent 254-inches with 1-inch resolution.

The smart WQM system, the Atlas scientific pH kit is used to detect the pH value of water. The pH kit consists of three main components: EZO TM class embedded pH circuit, BNC shield, and pH probe. In the process of collecting water pH data, the pH probe is connected to BNC shield. The BNC shield transfers the ph probe sensing data to the embedded pH circuit, and the resulted ph data is then provided to the FPGA board. The embedded pH circuit can be operated in two modes. The pH data is converted into binary by the embedded pH such as UART mode and I2C mode. In this proposed smart WQM system, the UART mode is used for its default mode with baud rate of 9600 bps, 8 data bits, 1 stop bit, no parity and no flow control.

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The smart WQM system, the temperature of the water is monitored using a 1-wire protocol digital thermometer sensor (DS18B20). The DS18B20 temperature sensor provides 9-bit to 12-bit Celsius degree temperature measurements. The DS18B20 is powered from the data line. The range of power supply 3.0V to 5.5V from data line is needed to power the DS18B20. The accuracy of DS18B20 is ±0.5°C from -10°C to +85°C. The temperature is converted 12-bit digital word in a maximum of 750 milliseconds. The temperature sensor DS18B20 is connected to the configurable NiosII soft processor system which is implemented on the Cyclone V FPGA of Altera DE1-SoC board.

The smart WQM system, the turbidity sensor SKU: SEN0189 is used to detect water quality by measuring level of turbidity. The turbidity sensor enables the detection of suspended particles in water by measuring the light transmittance and analogue and digital signal output modes, either of the mode can be selected according to the microcontroller unit (MCU). The threshold is adjustable by adjusting the potentiometer in digital signal mode. The operating voltage of the turbidity sensor is 5V DC and the operating current is 40mA (max) respectively. The smart WQM system, the Gravity: Analog Infrared CO2 sensor SKU: SEN0219 is used to measure the concentration of CO2. The concentration of CO2 is measured in parts per million (ppm). One ppm is like 1 milligram of something per liter of water (mg/l) or1 milligram of something per kilogram soil (mg/kg).

V. CONCLUSION

The occurrence of threats to child leads to increase in number of security devices and applications. This research shows the various factors which have been used in applications and smart devices developed for women safety. In this paper, the various techniques used so far for the sake of women safety against the fraudulent people have been discussed. Also, a brief explanation about the devices and components used in these techniques are also provided.

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