Internet of Things (IoT) Based on User Command Analysis: A Literature

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Abstract

In this paper proposes an efficient implementation for IOT (Internet of Things) used for monitoring and controlling the home appliances via World Wide Web. Home automation system uses the portable devices as a user interface. They can communicate with home automation network through an Internet gateway, by means of low power communication protocols like Zigbee, Wi-Fi etc. This project aims at controlling home appliances via Smartphone using Wi-Fi as communication protocol and raspberry pi as server system. The user here will move directly with the system through a web-based interface over the web, whereas home appliances like lights, fan and door lock are remotely controlled through easy website. An extra feature that enhances the facet of protection from fireplace accidents is its capability of sleuthing the smoke in order that within the event of any fireplace, associates an alerting message and an image is sent to Smartphone. The server will be interfaced with relay hardware circuits that control the appliances running at home. The communication with server allows the user to select the appropriate device. The communication with server permits the user to pick out the acceptable device. The server communicates with the corresponding relays. If the web affiliation is down or the server isn't up, the embedded system board still will manage and operate the appliances domestically. By this we provide a climbable and price effective Home Automation system.

Keywords: *Arduino; Internet of Things; Web Server; Home Automation.*

1. Introduction

The Internet of Things (IOT) is still in its infancy and as such there is not yet a consistent allembracing definition of it. However at the most simplistic level it relates to the connection of a variety of devices to the Internet and the Machine-toMachine (M2M) interfaces used between these devices. These interfaces will provide new opportunities through the additional sharing of data from the devices to inform government processes and services. One of the earliest examples of this can be seen in the Health domain and the TGF Health Profile v1.0 highlights how there is an increasing use of remote sensors and devices in the provision of Home and Community healthcare. Depending on who you talk to, the Internet of Things (IOT) is defined in different ways, and it encompasses many aspects of life—from connected homes and cities to connected cars and roads (yes, roads) to devices that track an individual's behavior and use the data collected for "push" services. Some mention one trillion Internet-connected devices by 2025 and define mobile phones as the "eyes and ears" of the applications connecting all of those connected "things." Depending on the context, others give examples that are less phone-centric, speak of a class of devices that do not exist today or point to Google's augmented-reality smart glasses as an indication of things to come. Everyone, however, thinks of the IOT as billions of connections (a sort of "universal global neural network" in the cloud) that will encompass every aspect of our lives. All of this public discussion suggests the IOT is finally becoming a hot topic within the mainstream media. Many recent articles point to the IOT as the interaction and exchange of data (lots of it) between machines and objects, and now there are product definitions reflecting the same concept.

Arudino Board The Arduino is a family of microcontroller boards to simplify electronic design, prototyping and experimenting for artists, hackers, hobbyists, but also many professionals. People use it as brains for

their robots, to build new digital music instruments, or to build a system that lets your house plants tweet you when they're dry. Arduinos (we use the standard Arduino Uno) are built around an ATmega microcontroller essentially a complete computer with CPU, RAM, Flash memory, and input/output pins, all on a single chip. Unlike, say, a Raspberry Pi, it's designed to attach all kinds of sensors, LEDs, small motors and speakers, servos, etc. directly to these pins, which can read in or output digital or analog voltages between 0 and 5 volts. The Arduino connects to your computer via USB, where you program it in a simple language (C/C++, similar to Java) from inside the free Arduino IDE by uploading your compiled code to the board. Once programmed, the Arduino can run with the USB link back to your computer, or standalone without it — no keyboard or screen needed, just power.Motivation Nowadays office and building automation systems are used more and more. On one hand, they provide increased comfort, results in a smarter home and is used to provide a healthier standard of living. On the other hand automation systems installed in commercial buildings don't only increase comfort, but also allow centralized control of heating, ventilation, air condition and lighting, having ubiquitous access. Hence, they contribute to an overall cost reduction and also to reduction and also to energy saving while we are not able to access them physically. Problem Defination There is a great energy crisis in current situation of our country. Moreover, people have become negligent in proper utilization of the available energy. People often forget to turn off the light sources and other home appliance while staying out from home. Even in those situations, application of home automation makes it possible to control them from a distant place in easy way with our smart phone. People are constantly running from place to place, working to accomplish everything on our neverending "to-do" list. Because of the home automation system, we never have to worry about opening the door, switching off the appliances and so on. In short, we can save precious time and experience more daily productivity
system that can be used to remotely switch on or off any household appliance, using a microcontroller to achieve hardware simplicity, low cost short messaging service for feedback and voice dial from any phone to toggle the switch state.

Literature Review

Embedded IoT Systems: Network, Platform, and Software, With the rapid development of connected embedded devices being placed everywhere in our everyday life, the vision of
the Internet of Things (IoT) is coming close to reality where billions of physical world devices have a digital presence on the Internet. However, despite the importance of IoT, there are still several technical challenges remaining before the next Internet revolution. This special issue has focused on technical challenges that can enable IoT. the most recent advances in embedded systems for IoT. Until the deadline of the special focused on the energy efficiency and power transfer for IoT devices, device-to-device communication, multithreading for multicore IoT platforms, and topology construction and scalability of IoT networks. Accepted manuscripts present the important research findings and these advances will contribute to the development of IoT. Evaluation of power efficiency is important for low power wireless personal area network (LoWPAN) devices and applications in IoT. Conventional methods to evaluate the power efficiency of LoWPAN devices rely deeply on the accuracy of the testing equipment, which trades off high cost with limited accuracy. To tackle this challenge, a low cost, real-time power measurement platform called PTone is proposed, which can be used to detect the real-time power usage of LoWPAN devices and be able to determine the state of each module of device under test. Based on PTone, an abnormal status diagnosis mechanism is developed which can not only judge abnormal status, but also classify the abnormal status and locate the abnormality causing module accurately.

IOT Based Monitoring and Control System, IOT (Internet of Things) used for monitoring and controlling the home appliances via World Wide Web. Home automation system uses the portable devices as a user interface. They can communicate with home automation network through an Internet gateway, by means of low power communication protocols like Zigbee, Wi-Fi etc. This project aims at controlling home appliances via Smartphone using Wi-Fi as communication protocol and raspberry pi as server system. The user here will move directly with the system through a web-based interface over the web, whereas home appliances like lights, fan and door lock are remotely controlled through easy website. An extra feature that enhances the facet of protection from fireplace accidents is its capability of sleuthing the smoke in order that within the event of any fireplace, associates an alerting message and an image is sent to Smartphone. The server will be interfaced with relay hardware circuits that control the appliances running at home. The communication with server allows the user to select the appropriate device. The communication with server permits the user to pick out the acceptable device. The server communicates with the corresponding relays. If the web affiliation

is down or the server isn't up, the embedded system board still will manage and operate the appliances domestically. By this we provide a climbable and price effective Home Automation system.

Automatic Smart Parking System using Internet of Things (IOT), Internet of Things (IOT) plays a vital role in connecting the surrounding environmental things to the network and made easy to access those un-internet things from any remote location. It's inevitable for the people to update with the growing technology. And generally people are facing problems on parking vehicles in parking slots in a city. In this study we design a Smart Parking System (SPS) which enables the user to find the nearest parking area and gives availability of parking slots in that respective parking area. And it mainly focus on reducing the time in finding the parking lots and also it avoids the unnecessary travelling through filled parking lots in a parking area. Thus it reduces the fuel consumption which in turn reduces carbon footprints in an atmosphere.

Analysis of Power Consumption Efficiency on Various IoT and Cloud-Based Wireless Health Monitoring Systems, Nowadays, various Wireless Health Monitoring Systems use Internet of Things to transmit patient's data over Wireless Sensor Network and then the data is stored and processed via Cloud Computing, however, the use of different kind of Wireless Sensor on each system leads to power efficiency problem. This paper analyses and compares the consumption of power on six Wireless Health Monitoring Systems, which are invented to monitor the patient's condition and transfer the data using Wireless Sensor Network. Three different techniques are analyzed, namely GPRS/UMTS (used in one WHMS), Wi-Fi (used in one WHMS), and Bluetooth (used in four WHMS). This paper concludes that the systems that use Bluetooth as their transmission medium are more effective in reducing power consumption than the other systems that use GPRS/UMTS or Wi-Fi.

An Iot Based Appliance And Monitoring System For Smart Homes, Recent years the smart home has been accepted and used in home environment widely. In this paper, we propose a smart home is challenging of remote access and control monitoring system which supports data transmission. A smart home is also one of the applications of IoT. Rapid growth in technologies and improvements in architecture comes out many problems that how to manage and control the whole system, Security at the server, security in smart homes, etc. In an approach to incorporate strong security in deploying IoT for smart home system, together with due consideration given to user convenience in operating the system. A GPRS gateway is used as the center node of the system to perform the system initial configuration. It is then responsible for authenticating the communication between the IoT devices as well as providing a mean for the user to setup, access and control the system through an Website and Android based mobile device running appropriate application program.

IOT Based Auto Irrigation System Using Soil Moisture Sensor, IOT designed to develop an automatic irrigation system which switches the pump motor ON/OFF on sensing the moisture content of the soil. In the field of agriculture, use of proper method of irrigation is important. The advantage of using this method is to reduce human intervention and still ensure proper irrigation. The project uses an 8051 series microcontroller which is programmed to are interfaced to the control unit. This concept is more enhanced by integrating IOT(internet of things) technology, such that whenever the water pump switches ON/OFF, the concerned person or the farmer using this system get to know about it through the web page regarding the status of receive the input signal of varying moisture condition of the soil through the sensing arrangement. This is achieved by using an op-amp as comparator which acts as interface between the sensing arrangement and the microcontroller. Once the controller receives this signal, it generates an output that drives a relay for operating the water pump. A WiFi modem is interfaced to the microcontroller to send the current status of the soil and water pump. The sensing arrangement is made by using two stiff metallic rods inserted into the field at a distance. Connections from the metallic rods the pump.

Impact of Frequency-Hopping NB-IoT Positioning in 4G and Future 5G Networks, The positioning support is under study within the narrowband (NB) Internet of things (IoT) standard of Long Term Evolution (LTE) cellular networks. However, the limited signal bandwidth of this technology poses serious difficulties to achieve a position accuracy below 50 meters, which may be required in current 4G and future 5G standards. This work studies the impact of a frequency-hopping (FH) scheme on the LTE positioning reference signal (PRS) for NB-IoT applications. The downlink time-difference of arrival (TDoA) method is used to compute the achievable positioning performance of FH PRS scheme. The simulation results indicate the feasibility to achieve a position accuracy below 50 meters, by covering a system bandwidth of 10 MHz with two consecutive hops. Future work is aimed to evaluate the FH impairments for advanced configuration schemes.

Home Appliances Control System Based On Android Smartphone, The remote appliances control system based on the Android smart phone GUI is designed on Android Smartphone. A user logs into the smart Android phone interface, and clicks the buttons gently to send message commands from the GUI which will be transmitted to home information center through the GSM network. Then the AVR ATmega processor recognizes the specified command, and controls the home appliance switches in the wireless radio frequency manner to achieve remote control of appliances ultimately. This seminar focuses on the design of Android terminal, the communication between PIC and GSM module, the realization of the wireless module device's driver, the difficulty in supplying the appropriate low-voltage DC for MCU and wireless module just by a single live wire. The users can manipulate appliances anytime, anywhere, letting our houses become more and more automated and intelligent. There are some problems in the PC monitor terminal, such as its great bulk, inconvenience to carry, high cost, limited monitoring range and so on. Therefore, it's a good choice to design a terminal based on phone.

IOT based Interactive Controlling and Monitoring System for Home Automation, The "IOT based Interactive Controlling and Monitoring System for home automation" is a new technological advancement which can control and monitor devices nor only for home automation but any real life appliances remotely. Any automation project using embedded system like PIC Microcontroller provides an intelligent , low cost, energy preserving system for homes ,schools ,hospitals The main objective of this paper is to design and provide implementation details of IOT based ICMS for home as well as for any real life applications to automatically switch on/off lights, fans, gas, curtains ,gates using sensors, which is capable of controlling and automating most of the real life appliances through an easy manageable android based interface. The same project can be scaled up in distributed systems for any real life application.

Need for Wireless Fire Detection Systems using IOT, Internet of things is an interconnection of physical devices embedded with electronics, software, sensor which is capable of collecting data from the surrounding and sending data over internet is called IOT. The fire detection gathers all of the techniques and processes that contribute to early detection of a fire. We identify three main categories: Smoke detection, Flame detection and Temperature detection. Automatic fire alarm system provides real-time surveillance, monitoring and automatic alarm. An automatic fire alarm system based on wireless sensor networks is developed, which is designed for high-rise buildings. To provide early extinguishing of a fire disaster, large numbers of detectors which periodically measure smoke concentration or temperature are deployed in buildings. In this paper will we present the different techniques we had been already used to detect fire. Some of those techniques include fire detection using image processing and sensors, fire detection using CCTV technology, Fire detection using zigbee which is a kind of personal area network.

Environmental Monitoring Using Wireless Sensor Networks(WSN) based on IOT, In recent years, we have seen a new era of short range wireless technologies like Wi-Fi, Bluetooth [7], ZigBee [6], emerging in front of us. The project aims at building a system which can be used on universally at any scale to monitor the parameters in each environment. Raspberry-pi and sensors collects all the real-time data from environment and this real-time data is fetched by the web server and display it. User can access this data from anywhere through Internet. Raspberry Pi works as a base station which connects the number of distributed sensor nodes via zigbee protocol. Wireless Sensor Networks (WSN) has been employed to collect data about physical phenomenon in various applications such as habitat monitoring. The Internet of Things (IoTs) can be described as connecting everyday objects like smart-phones, Internet TVs, sensors and actuators to the Internet where the devices are intelligently linked together enabling new forms of communication between things and people, and between things themselves. In wireless sensor network system, the sensor node sense the data from the sensor and that data collects the end tags, end tags send its data to the router and router to coordinator and supply multi-clients services including data display, the whole data will be stored in base station and the stored data will send to the cloud (Ethernet) and the client can visit the base station remotely via (website) Ethernet. Such a sensor are temperature, vibration, pressure, moisture, light, and pollution.

System Analysis

Existing System • The existing system for controlling home appliances is either a manual or remote control process. • Manually, home appliances like Light, fan, etc are controlled by human beings. • Lot of energy wastage. • Time consumption. • Lot of wastage in electricity. • It is outdated now. • Makes use of arduino and GSM.

Proposed System • The proposed system is an IOT Based technology used for operating home appliances using android phone. • Smart Home -Improves the standard of living at home. • Control Fan through the mobile application. • Using vibration sensor and fire sensor. • Uses GSM and Arduino.

System Design and Implementation

Modules Description System analysis uses various types of information systems to support many processors needed to carry out their business function. Each of these information systems has a particular purpose, and each have a life of its own. This "life of its own "concept is called the System Development Life Cycle. Software Requirements Front End : HTML Database : MYSQL IDE : Android eclipse, Aurdino Coding Language : java Hardware Requirements Micro Controller : Arduino Regulated Power Supply : 230AC-5V Display : LCD Display Phone : Android smart phone Sensors : Vibration, fire.

Conclusion

By using this application we can control home appliance. This have been implemented using multiple ways such as The Internet, electrical switch, and Graphical User Interface (GUI). By using phones and tablets we can reduce the cost. The system is suitable for remotely controlling the appliances. Here, we have introduced the event of a home management and security system exploitation using Arduino and Internet of Things technology. The system is suitable for real-time home safety monitoring and controlling the home appliances. The various future applications may be used by controlling various household devices of house with internet, Industrial automation and management through internet, machine-driven fireplace exit systems and improvement of security problems in extremely restricted areas.

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