

AUTOMATIC CONTROLLING OF ELECTRONIC DEVICES AND POWER CONSUMPTION ANALYSIS USING IoT

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Abstract – The electronic devices are left on by employees most of the time after working hours. This leads to wastage in current which eventually gives a huge amount of Electric bill . So here we have : An Automatic System where all the electronics devices are controlled remotely.

As we know, the electricity usage is increasing day by day. Consumer comes to know about the consumption of electricity in his house after a month.

Till then he is unaware of it. After receiving the electricity bill user gets worried . Hence to reduce the wastage of energy ,money as well as use the electricity efficiently, this device has been designed. The device notifies the user about his home electricity usages by sending alerts, statistics, graphs, etc. which will lead to energy saving. This device uses concept of IOT (Internet of Things) i.e. connecting the devices to the internet and transferring data collected by them to storage server. The user can then read and decide his actions and act accordingly.

The aim of this project is to help user to monitor the electricity consumed by its device and if the device is malfunctioning it will ultimately consume large amount of energy, and this can be detected and user would be informed about the device consuming more power.

Index Terms – Internet of Things (IOT)

I. INTRODUCTION

The usage of electricity is increasing day by day. User may come to know about the electricity consumption of his house after a month. Till then he is not aware about the consumption. After receiving the electricity bill user starts worrying. In-order for reducing the wastage of energy and money as well as to use electricity efficiently, this system has been designed. User is notified by the system about his electricity usages by sending alerts, etc. which tends to be energy saving. This device uses concept of IoT i.e. connecting the devices to the internet and transferring data collected by them to storage server. The user can then read and decide his actions and act accordingly. Aiming to help user monitor the energy consumed by the device and if the device is malfunctioning it will ultimately consumes a huge amount of energy, and this

can be detected and user would be notified about the malfunctioning of that particular device.

II. RELATED WORK

There are some similar devices developed prior to this paper. They include smart meter and meter plug. Following gives the detail idea about both of them.

A. Smart Meter

Smart meter gives the energy consumption of a customer and provides information about it to the supplier company. Smart meters gives the reading of real-time consumption of energy information that contains the values of voltage, phase angle and the frequency and securely transmits that data to supplier company. Bidirectional communication of it provides the capability to collect data regarding the electricity. A smart meter system includes a smart meter, communication infrastructure, and control devices[3]. Smart meters can operate control commands not only remotely but also locally. All electronic devices and home appliances can be controlled by Smart Meter. They can also collect diagnostic information about the distribution grid, home appliances, and can communicate with other meters in their reach[3]. They bill the customer according to their usage excluding power consumed by storage devices. The collected data from smart meters contains a unique meter identifier, data timestamp and the values of electricity consumption. Electricity supply can be cut or reconnected remotely.

B. Meter Plug

The meter plug is placed in between the socket and device which gives the power consumption of the device is at that time. It gives power consumption during a connected session, and calculate kilowatts and dollars per day, week, month or year[7].

III. DOMAIN INFORMATION

1. IoT:

The Internet of things (IoT) is nothing but the network of home appliances, physical devices, or other devices embedded with electronics, software's, actuators, and connectivity which enables them to connect such things on the internet so that it can gain more attention. IoT devices are a part of the larger concept of home automation, which further includes lighting, heating and air conditioning, media and security systems. Long term benefits includes energy savings by automatically ensuring lights

and electronic devices that can be turned off.

2. Cloud Computing:

Cloud computing is nothing but a general term that is used to represent the delivery of hosted services over the network or the internet. Cloud computing is a type of computing that relies on shared computing resources rather than having a local server or personalised devices to handle various applications. Applications, storage and other services can be accessed through the Web. Cloud computing can be divided into several categories based on the physical location of the computing resources and who can access those resources such as public ,private and hybrid cloud.

ANALYSIS

Software requirements:

Operating System: Windows XP and above, Linux 3.0,MAC 7.0 and above.

Arduino IDE

.net c sharp

Hardware requirements:

1.1GB RAM and above.

2.Pentium processor and above.

3.Workstation with 2.0 GHz Processor and above.

4. Arduino UNO

- It alerts the user about the peak usage of an appliance.
- It helps to estimate the bill.

IOT based electric controlling and measuring consumption of a device is designed to notify the user of its appliance usage on over consumption of electricity. In our project there is a use of current sensors and Wi-Fi module that would be connected to Arduino and Relay board, that send a signal to the mobile device through IOT gateway using network connectivity. Thereby reducing the unnecessary power usage.

5. Relay

6. Current Sensors ACS712

7. WIFI Module esp8266

Functional requirements:

- 1.Should process a request in at most 1minute.
- 2.Output should display within few sec.
3. Alters should be send Immediately.
4. Must be able to properly analyse the current measures.

Non-Functional Requirements

- i) Maintainability: Software must evolve to meet changing needs.
- ii) Security: Security software must be installed to prevent malicious software to corrupt the system and prevent unauthorised access.
- iii) Environmental: Renew and review Environmental Policies periodically
- iv) Interoperability: Operable across Multiple Platforms.
- v) Capacity: Around 100 users should be able to use the system simultaneously.
- vi) Availability: 24 Hrs Availability.
- vii)Dependability: Software must be trustworthy.
- viii)Usability: Software is useful to the user for which it is designed.

IV. RESULT

- It controls electronic devices automatically.
- It notifies the user about the electric unit consumed by the appliance.
- It helps to detect the faulty appliance.

V. CONCLUSION

VI. REFERENCES

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