

# Monitoring & Controlling Electricity using IoT

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**Abstract**— The project proposes an efficient implementation for IoT (Internet of Things) used for monitoring and controlling the electricity via World Wide Web. The user here will move directly with the system through a web-based interface over the web, whereas meters are remotely controlled through easy website. Electrical energy generating and supplying company is having problems like electricity thieves in remote areas and also financial losses in the economical properties of the companies. The server will be interfaced with relay hardware circuits that control the meters the communication with server allows the user to select the appropriate meters. The communication with server permits the user to pick out the acceptable meter. The server communicates with the corresponding relays. Relays operate with the help of Bluetooth signals and the data will take from meter send to web portal. By this we provide a reliable and price effective meter controlling sys.

**Key words:** IoT (Internet of Things), Electricity

computer-based systems, and resulting in improved efficiency, accuracy and economic benefit in addition to reduced human intervention. When IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyber-physical systems, which also encompasses technologies such as smart grids, virtual power plants, smart homes, intelligent transportation and smart cities

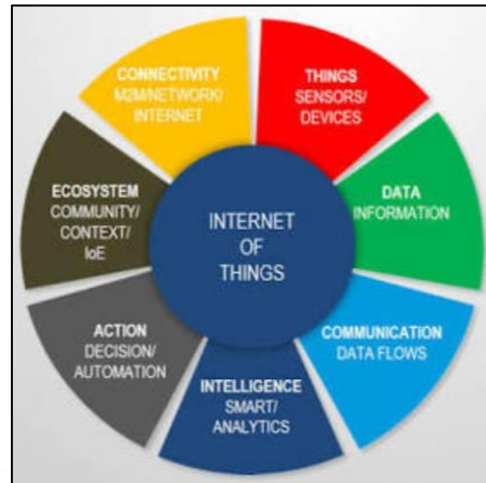


Fig. 1:

## I. INTRODUCTION

Monitoring and controlling electricity using IoT is working with basic principle of internet. IoT is the advance technique in smart world .We use this technique in our project with electrical meter, relay and arduino circuit .Signal to arduino is given by wireless network. Using this signal we can connect or disconnect electrical supply to a user. User can also see their daily used electricity on the company portal. Automated bill generating system using daily monitored data of user. This will save the numbers of employee costing for the meter reading. Our proposed IoT based automation system not only reduces overall cost because of PIC Controller which when used in distributed environment drastically reduces project cost because of cheaper components used, also it upgrades and does auto-system reconfiguration. Basically a signal to arduino is given by as a command which works as a configured device and controllable element. The controlling signal is given to the relay which can be operate as a switch. All meter data is send to given IP address and on which a user can see his own used electricity in the given units

## II. THE INFORMATION ABOUT IOT

The internet of things is the network of physical devices, vehicles, home appliances and other items embedded with electronics, software, sensors, actuators, and connectivity which enables these objects to connect and exchange data. Each thing is uniquely identifiable through its embedded computing system but is able to inter-operate within the existing Internet infrastructure. The figure of online capable devices increased 31% from 2016 to 8.4 billion in 2017. Expert’s estimate that the IoT will consist of about 30 billion objects by 2020.It is also estimated that the global market value of IoT will reach \$7.1 trillion by 2020. The IoT allows objects to be sensed or controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into

### A. Information about Electric Energy Meter

#### 1) Definition

The meter which is used for measuring the energy utilises by the electric load is known as the energy meter. The energy is the total power consumed and utilised by the load at a particular interval of time. It is used in domestic and industrial AC circuit for measuring the power consumption

#### B. Block Diagram

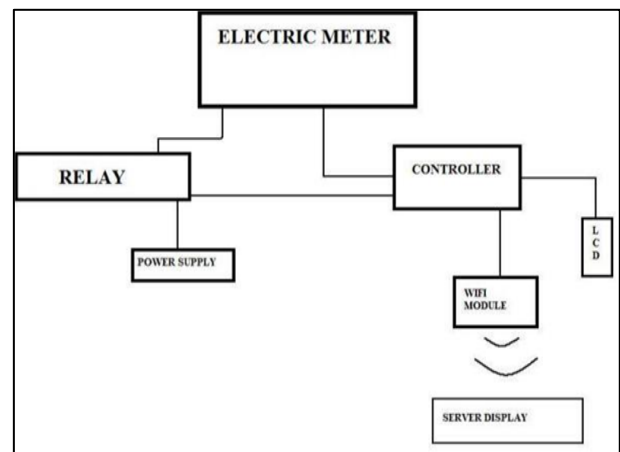


Fig. 2: Block Diagram

### C. Simulation Circuit

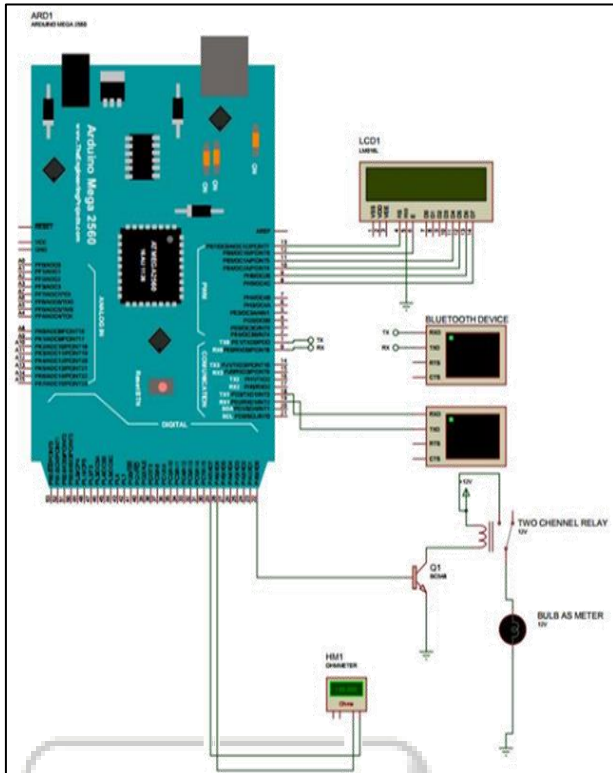


Fig. 3:

### III. RESULTS\ANALYSIS

#### A. Result no 1

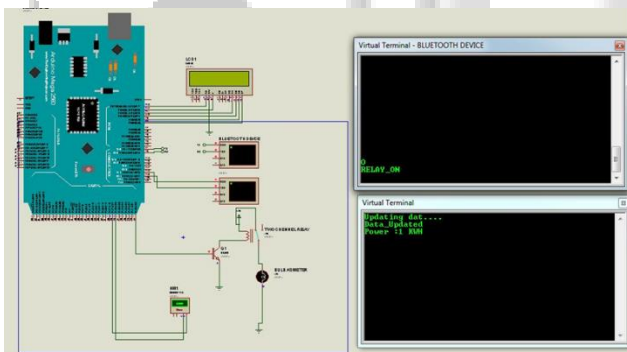


Fig. 4:

#### B. Result no 2

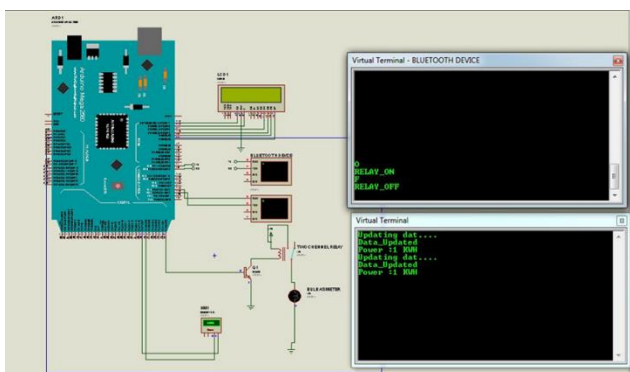


Fig. 5:

As we see in the result the relay is commanded by virtual terminal and the operation "ON" and "OFF" is done

### IV. CONCLUSION

The use of embedded system using arduino microcontroller reduces project cost because it is cheaper in cost compared to other embedded systems controlling IOT. Already developed IOT based projects systems, faces four main challenges; these are high cost of ownership, inflexibility, poor manageability, and difficulty in achieving authorization security. In earlier IOT based projects, energy consumption reduction is also not considered as criteria. This proposed system presents a low cost and flexible controlling and monitoring using an arduino web server, with IP connectivity for accessing and controlling meters and relays remotely using Smart phone application

### REFERENCES

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