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# Power theft Detection and Power Energy Saving by using Internet of Things

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**ABSTRACT:** As in everywhere automation is required to reduce the work and curbing electricity theft in India, which accounts for 80% of the power losses. While the nation strives to mark a new golden era, the power sector suffers contributing to blackouts and costs \$17 billion in lost revenue annually, according to calculations by Bloomberg. With the nation-wide production at over 250GW, as on August 2016, weak infrastructure accounts for various losses – transmission, distribution, aggregate technical and commercial losses due to these is occurs by power thefting our paper mainly focused on to identify these power thefting and calculate the units from the appliance and it gives the notification depend upon the consumption and electrical appliance may control through the internet at anywhere in the world there is no distance parameter for that and manual reset to start the function again. The main objectives of this system are described clearly as follows: theft of electricity increases the costs paid by customers and can have serious safety consequences. Detecting electricity theft has been traditionally addressed by physical checks of tamper-evident seals by field personnel and by using balance meters. Identify the theft by sending alert SMS to the owner. Sent meter readings and rate every month to the owner. Adding with these setup an efficient Internet of Things (IOT) is defined, which portrays the global connection environment to the users and allow them to view the status of meter reading and theft associations globally from anywhere at any time. Theft of electricity has a material impact on customers in terms of cost and safety. We consider that the existing regulatory framework does not adequately encourage suppliers to be proactive in detecting theft.

**KEYWORDS:** Advanced Metering Infrastructure(AMI),energy savings, Internet of things,Energy theft,optimization, Electricity usage.

### I. INTRODUCTION

The smart EB is an advanced platform to the way we receive electricity today. In previous days the demand for electricity was substantial compared to that presently. Since the demand for electricity has tremendously increased, a redesign of the current grid system is much needed. With the technology accessible in these modern times, the smart grid could be designed in such a manner, that it uses digital communications technology to detect and react to local changes in usage. The system will feature a two-way dialog where electricity and information can be passing between the consumer and utility.

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This can rise or reduce the amount of energy a consumer needs by analyzing the feedback of the two-way dialog. In the system a smart energy meter is installed in every consumer unit and a server is maintained at the service provider side. Both the meter and the server are equipped with which facilitates communication between the two ends using Server. The Arduino gets the tariff data from the Energy meter and sends the acquired data to the server.

The server in the transference system is connected with the cloud, through this we can able to monitor and control the electricity lines of every consumer through Internet. This system also serves to shut off the EB Line to the consumers who are not paying their monthly bills properly. The process can be easy and maintenance then even more secure this system also helps the consumers to monitor their daily usage of current through Internet.

The transmission of electricity and information passing consumer and utility would grow efficiency, reliability and security. The smart grid also able to renewable energy technology to be integrated into the system for a greener, more environmentally friendly method.

In IOT enabled adaptive context aware and playful cyber physical system for everyday energy savings [1] 16.21%..In this system mainly used in industries. Energy theft detection in multi tenant data centres with digital protective relay deployment[2]It mainly used in utility companies. Rethinking social psychology and intervention design[3]it mainly used in energy savings in human behaviour. Using feedback through digital technology to disrupt and change habitual behaviour[4]This can be mainly detects the electricity utilizing detects.

## RELATED WORK

In this system a new intrusion prevention system for protecting smart grids from ICMPv6 vulnerabilities. Smart grid is integrated power grid with a reliable, communication network running in parallel towards providing two way communication in the grid.It's trival to mention that a network would connect ahuge number of enabled devices .It becomes an obvious choice in the system.

## II. PROPOSED SYSTEM

Advanced metering infrastructure (AMI), which comprises smart meters, communication networks, and information management systems, is enhancing the operational efficiency of utility and providing electricity customers with information to more effectively manage their energy use.

Smart grid applications enable to use automatically locate and isolate faults to reduce outages, dynamically optimize voltage and reactive power levels for more efficient power use, and monitor asset health to guide maintenance.

### A.Proposed Block diagram

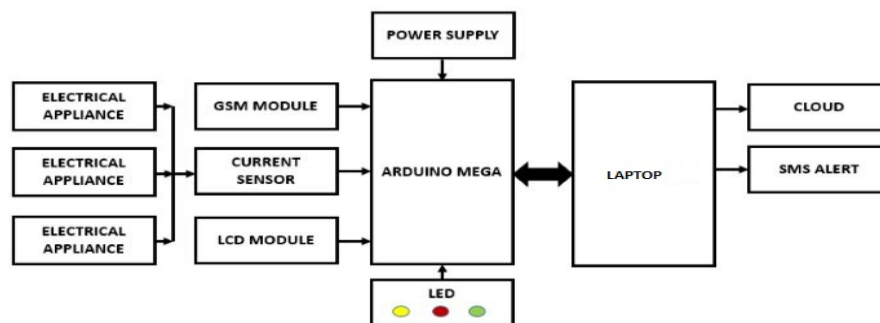


Fig A. Energy saving system

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We are proposed the project to give the notification to the consumer side how much power they consumed depend upon the units once the units is reach above 50 automatically give the notification to the consumer side and depend upon the consumption LED indication is also present below 50 means GREEN LED is On, above 50 to 90 units means YELLOW LED IS ON, and once reach above 90 units means RED LED is ON. Fig A. Shown the energy saving system.

## B. Operation of Proposed system

Smart grid applications enable utilities to automatically locate and isolate faults to reduce out ages, dynamically optimize voltage and reactive power levels for more efficient power use, and monitor as set health to guide maintenance. The main need of these proposed model are design a smart grid using various sensors this can be controlled and monitored by the Raspberry Pi via the Internet of Things (IOT) and to provide a low cost platform for interconnecting electrical/electronic devices and various sensors in a home via the internet network.

## C. Power Theft Identification

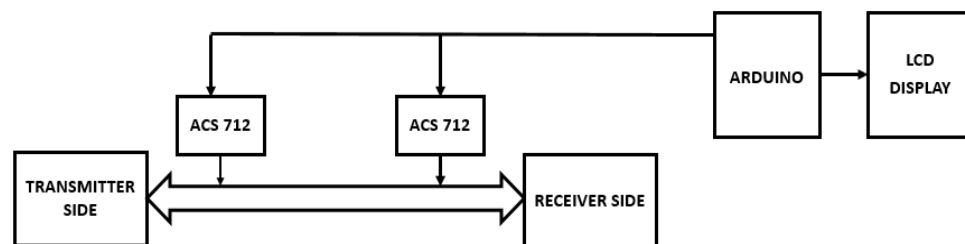


Fig B. Power theft identification system

To placing the current sensor in the transmitter side and receiver side if any one theft the power in-between the lines receiver side is get analyse power consumption automatically gives the indication through the LCD screen.

To automatically control the electrical appliance through internet because it does not having any kind of distance parameter and the continuously monitoring the data and stored in cloud by using button to manually restart the function. Fig B. Shown the power theft identification system.

## III. EXPERIMENTAL RESULT ANALYSIS

The power theft identification by using ACS712 sensor. these sensor normally attached in every meter. the energy can be transfer from main substation to different homes and industries. the main substation have attached with global system for mobile communication. these techniques is mainly used to identify the theft in particular areas. The theft identification informations are sent to mobile EB officer. The theft identified by mainly comparision of actual input load and the output loads. (in homes and industries). so we can save 80% of energy in this method. Fig C. Shown the smart EB using IOT.

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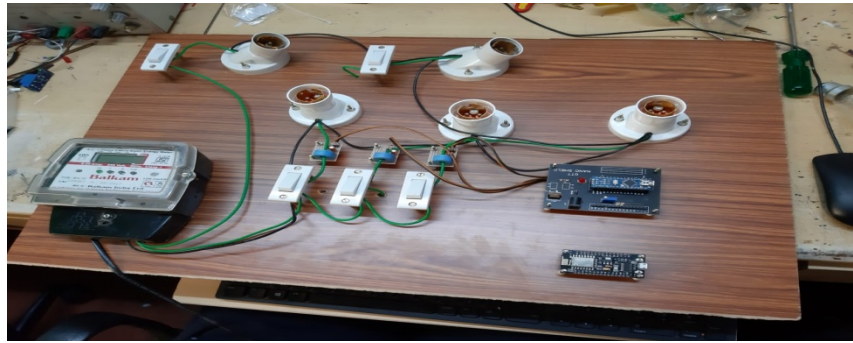


Fig C. Shown the smart EB using IOT.



Fig D. Shows the energy saving detection using IoT.

## IV. COMPARISON RESULT ANALYSIS

Task	Service Name	Ies	Iea	Energy saving(%)
1.	Multimedia auto off when away	IR array	TV,PC Speaker	10%
2.	Auto switch off when leaving house	IR array	TV, PC speaker, light, fan, lamp	21.43%
3.	Attentive lights at night	IR array	All lights	19.34%
4.	Auto switch off when sleeping	IR array	All appliance(Except necessary appliances)	13.10%
5.	Smart EB using IOT	IR rays	All appliances in industries and homes	80%

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## V. CONCLUSION

In the era of smart city advancement, this project is focussed on the connectivity and networking factor of the IOT. In this system, an energy consumption calculation based on the counting of calibration pulses is designed and implemented using ATMEGA328P Microcontroller unit in embedded system domain. In the proposed work, IOT and MMC based meter reading system is designed to continuously monitor the meter reading and service provider can disconnect the power source whenever the customer do not give the monthly money and also it eliminate the human involvement, delivers effective meter reading, prevent the bill paying mistake. This Project has achieved following objectives: Easy of accessing information for buyer from energy meter through IOT. Theft detection at consumer end in real time. LCD displays energy consumption units and temperature. Disconnection of service from remote server.

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