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Elucidation: Scantiness of Electricity and its Effective Utilization during Peak Hours

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Abstract: ***The paper titled "Elucidation: Scantiness of "electrower" is an electric energy and its effective utilization during peak hours" is used to book the electrower according to requirement of the customers so that everyone can use the electrower effectively and efficiently without any wastage. The electricity usage is more than the generated during peak hours, due to this there is a shortage of electricity. To overcome this problem, we are proposing a system called Elucidation: Scantiness of electricity and its effective utilization during peak hours. There are separate modules for customer and administrator. The customer module has the page where the customer can book for electricity, request for cancellation, request for incrementing the power supply. The admin module can accept the requests from the customers and has the rights to cut off the electricity when threshold limit of the power is reached. The entire concept will be demonstrated through model.***

Keywords: Elucidation, Electrower, Loel, Adel.

I. INTRODUCTION

Electrower is an energy. It is an electrons flow in a circuit. It is a basic requirement and it is one of most extensively used energy source. Electrower is the subordinate source of energy which is produced using energy efficient sources such as coal, nuclear power and water. Many metropolitan and township were built alongside water falling from the height (a efficient source of force) that turned water turbines to rotate. Before begin of electric energy generation slightly over seventy-five years ago, houses were illuminated with lamps, food was freeze in iceboxes, and rooms temperature were controlled by burning wood or charcoal.

Electric power usage is one of our largest concerns of natural world, and of good reason. While the development of various different types of inexhaustible energy has reduced our dependency on fossil fuel for electricity, the second is still our main source of energy. Saving of power at home not only help to reduce our requirement for energy and in turn help reduce usage of using polluting fossil fuel along with that we can cut-down our budget used for electric energy. According to survey, we can save around twenty percentage by stopping electricity desolation every month.

Electrower desolation is one of the major problems in India. Because of the desolation of electrower, in future there might be electricity shortage. Electricity shortage may result in shortage of basic needs such as water, food etc.

Most of the time, electricity is used more than requirement, this is ok when surplus energy is available and there is no restriction on the usage of electricity. When appliances are not used the socket is connected to power board which in-turn consume some power. One of the most obvious energy-wasting habits is leaving the lights on, and it's also one of the easiest habits to fix. Appliances and electronic goods use energy even when they're turned off. One tip to help save on utility bills is to unplug all electronic goods including TVs, computers, and phone chargers when they aren't in use. One of the issues related to electricity is electricity tripping. This occurs when the circuit breaker trips when too much electricity flows through it or when it cannot handle the excess current load. This means that the flow of electricity is cut off to keep your circuits from overheating or causing more damage. To avoid this, the project "Elucidation: Scantiness of Electricity and its effective utilization during peak hours" is introduced.

II. LITERATURE SURVEY

A typical house wastes 30 percent more energy than an efficient one does. On average, that means that 51 MMBtu's are being wasted by a typical home every year.
According to Times of India in 2014-15 over 3 billion units of electricity or a day's national consumption, were wasted as congestion in the transmission highways blocked trading between surplus and deficit regions. Data from various power exchanges show a higher wastage in 2013-2014 at 5.3 billion units, Delhi's consumption for roughly 56-60 days.

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Interior-region transfer through Short-term open access stood at 78.38 billion units during this period.

No doubt, such wastage -both in terms of actual power fed into the grid but not used and generation capacity that was not 'scheduled' due to grid bottlenecks-comes at a cost to the economy in terms of lost opportunities and idling power stations.

Electricity tripping is one of the major issues related to electricity. Many people without paying any amount to the electricity board and uses electricity free of cost, because of this people suffer from electricity tripping which occurs when the circuit breaker trips when too much electricity flows through it or when it cannot handle the excess current load. This means that the flow of electricity is cut off to keep your circuits from overheating or causing more damage.

By using following methods, we can reduce the electricity wastage:

Lighting

1. Use natural daylight to its maximum.
2. Using the light during the day is a classic example of electricity wasted.
3. Replace current lights with LED's. -(Savings over CFL=30%minimum)
4. Cleaning and getting rid of dust from your lighting fixtures will help to maintain illumination.

Refrigerators

1. We never switch off refrigerators once it is on.
2. It is the major cause of electricity wastage.
3. When high cooling option is set, it will increase electricity consumption, so it should be minimum cooling.
4. When there is voltage fluctuation, there will be electricity wastage.

Air Conditioning

1. If the window A/C system is not operated properly. It leads to great amount of electricity wastage.
2. Due to over or under sized unit, A/C can cause electrical wastage.
3. To recover investment cost, replace old units with new ones.

Water Heaters or Geysers

1. To save thermal loses it is always advised to insulate water heater.
2. For working efficiency of heater, it should be properly maintained.
3. Install heat traps.

In the classical existing system, human should manually pay the bill, need to check at electricity distribution office. It is associated with many challenges like, 1) Customers not at home 2) No retriving of meter reading and 3)Low integration and credibility. To overcome these challenges, the following method is proposed.

III. PROPOSED SYSTEM

In Proposed System, there is a controlled usage of electricity as there is an automatic shutdown of power whenever the usage of electricity is more than the registered electricity is used. The notification is sent to the user by the admin if the user has reached threshold level, such that the user can cut down the power which being used unnecessarily. The user has to make an account by registering through app and then request for electricity by giving the address, name and other personal details. If the user has registered, booked then only electricity will be provided to house.

This approach is used to reduce the wastage of electricity by advance booking of required electricity.

1. During summer, there is a shortage of electricity due to the shortage of water. Hence the electricity must be used without any wastage. In this paper there is one Power station through which electricity is passed and gets divided to multiple sub stations, from which the electricity is sent to different houses who has booked for electricity.
2. The user has to register his house address and personal details into the website and then login and book the electricity, by giving the details of the appliances used.
3. The electricity will be provided to the user unless the user cancels the booking.
4. While cancelling, the notification is sent to the admin so that he can transfer the current to the other user who requires electricity.

IV. METHODOLOGY

The paper “Elucidation: Scantiness of electricity and its effective utilization during peak hours” consists of the following modules:

Software design:

1. Customer panel
2. Admin panel
3. Registration and login panel

Customer panel

Customer panel is for the customers, through the customers can book for the electricity using app. Through this the customer has to book by providing personal details such as username, password, complete address details and required watts.

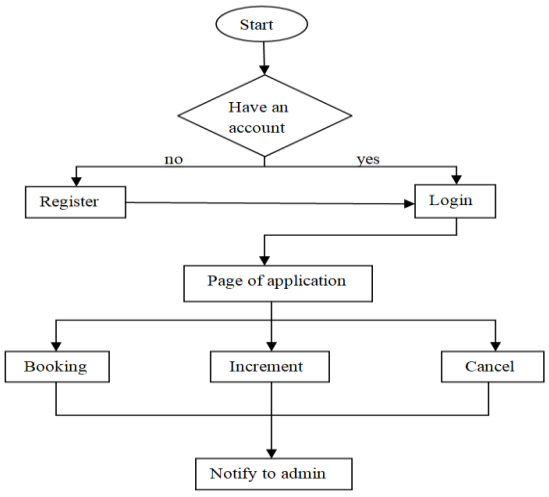

Fig 1: Customer Panel

- Start the application.
- Check if you have account. If you have already had an account then login by giving username and password else register in the Registration Panel.
- As soon as you have logged in, you can enter into the main pages.
- The options such as Booking, Increment and Cancel are available through which the customer can select the required option and continue the process.
- If you select booking the fields such as name, address and personal details can be filled and the pay the amount.
- If the user wants to increase the watts can increase if available, can cancel if not required.
- These activities are notified to the admin.

Adel

Adel is a admin panel through which the admin can login and check the details of the customers. He can check the customers whose consumption has reached the threshold power and can send the notification to shut down or to inform to decrease the consumption of electricity.

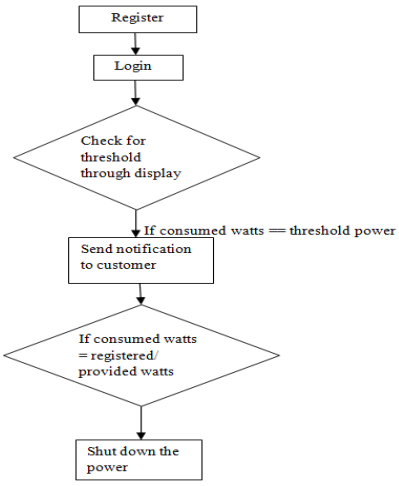

Fig 2: Admin Panel

- The admin has to register followed by login.
- He can check the details about the customers and power consumed.
- Admin will be continuously checking the threshold, if the power consumption reached to threshold power, notification is sent to the customer.
- If the registered watts are consumed then the power will be shut down for that particular home.

Registration and Loel

Loel is a login panel, during the process of registration user inputs data in the form and submit to company or individual object. Many companies use the same registration process to perform subscription services.

After registration, user needs to login. It is the process of entering user information into system in order to have access to the system. It also plays key role on security of system.

Usually login process involves user to enter user name and password. The information is made to be visible through efficient GUI tool.

User name is also called the registration code or login ID.

Hardware Design

ACS712-30A

It is a current sensor that detects electric current in a wire. The sensor also generates a signal, that signal is proportion with current.

Arduino Uno

There is a board on the Microchip ATmega 328P which has open source microcontroller called Arduino UNO.

It has got digital and analog I/O pins which can be connected various other circuits.

HL-52S Relay Module

Arduino requires voltage to be activated in order to initiate any process which requires the use of electromagnet. For that electromagnet, Relay module switch is required.

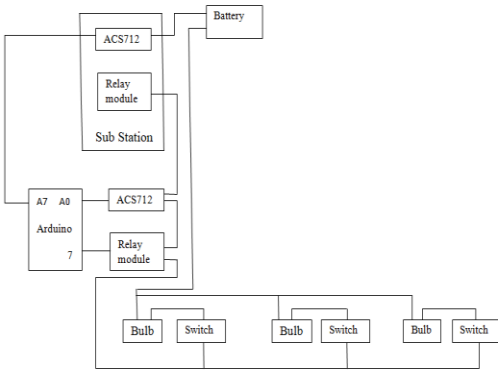

Fig 3: Circuit diagram for one house with sub station

- The above diagram refers about passing of a current through ACS712 and relay module to reach the electronic gadgets in the home.
- ACS712 module is used to identify how much current is passing through it and it is an Analog Device.
- Relay module is used like a switch or main switch and it is based on EMF(Electromagnetic Force).
- This ACS712 module passes the values to the Arduino, depending on those values relay module will be controlled.

V. RESULTS

Fig 4: Register Panel

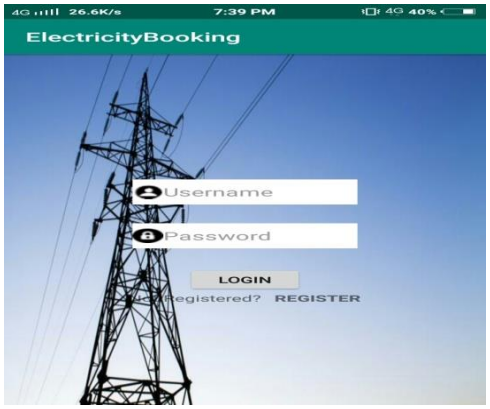

Fig 5:Login Panel

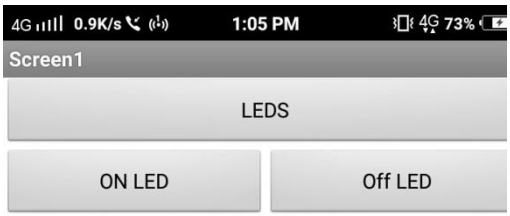

Fig 6: Lights connected through Bluetooth

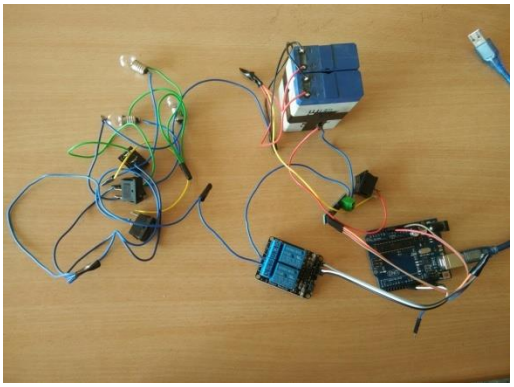

Fig 7:Connection for one house

VI. CONCLUSION

As the mankind is living in an advanced era, one needs to think of how best or how efficient we can utilize any form of energy. Out of which, optimal utilization of electricity is one of the best steps towards energy sustainability. Present days there are many methods to find the solutions to connect with nature. In this aspect, an energy efficient home is a personal step towards optimising energy resources and its effective utilization. This paper present efficient usage of electricity during summer without any disturbance.

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