Smart Electricity Bill Generation using Mobile App

B. Vinuthna, P. Ravi kiran, A. V.Prabhu

Abstract: Now a day's electrical energy provider companies have upper limit portion of automatically processing include calculation the bit and, reading in the paper. When the automatic procedure o f bill generation using the mobile application. In this we propose suggest android web application and, which is process carry by the meter reading and, web coating for consumer to interact with electricity board organizations. Using the mobile app for meter reading gaining control the image and sends to the server every energy meter will have a specific id, generated at the time of registration in the mobile. The app gives the information of electricity charged units along with the measure charged as pre the current recitation. In addition with this provides insight into the illegal use or abstraction of electricity. The importance and the economic aspects of theft detection are presented and the flow exercise and experiences are discussed. The newspaper also proposes a novel methodology for automated detection of illegal utilization of electricity in the time to come distribution net equipped with smartness metering infrastructure. The necessary data requirements for smart meters and distribution substations are defined, in guild to unlock this feature in distribution network. The paper also proposes the measures, which should be undertaken by the smart metering standards.

Keywords: Node Mcu, Internet of Things (IoT), Web Server, Remote monitoring, Automated Meter Reading.

I. INTRODUCTION

Now a day's electricity can play a major role in our daily lives. Then the use of electric automobile energy utilization is increasing day by day. So we can everywhere can access the power supply, the different functional we can't lives without electricity. So the device is used to measure the electricity usage and consumption is Electrical Cadence. Then this project aims to design the facilitate the electricity bill generation process and also the power theft intimation mechanism for electrical department. The previous scheme of human based electric meter reading is not applicable with the increasing population of electricity usage and has a more number of drawbacks, and it is very model, and time consuming process, more man power need to run this type of systems. Now introduce a methodological process based on internet of things using to store the information in cloud and accessed by the web page. In this method we use the app which provides the power supply and bill for every 5 readings the donation of this work is extracting and recognizing. Electric utility program lose large sum of money of money each year due to imposter by electrical energy consumers. Electrical energy fraud can be defined as a dishonest or illegal use of electrical energy. It is

difficult to distinguish honest and fraudulent customers. Realistically, electric service program will never be able to eliminate fraud. It is possible, however, to take measuring rod to detect, prevent and reduce fraud Investigations are undertaken by electric utilities to assess the impact of technical losses in generation, transmittance and distribution meshwork Distribution Power Exiting comprises one of the most important concerns for electricity Utilities worldwide.

II.INTERNET OF THINGS

A dynamic worldwide organization foundation with self-designing capacities dependent on standard and interoperable symmetrical conventions where physical and virtual things have identities, physical properties, and virtual identities and utilize keen interfaces, and are consistently coordinated into the data organize. The Internet of Things (IoT) is characterized by ITU and IERC as a dynamic worldwide arrange foundation with self-design capacities depletement on standard furthermore, interoperable correspondence conventions where physical and virtual "Synonyms/Hyponyms (Ordered by Estimated Frequency) of noun thing " have characters, physical character and virtual identities, utilize intelligent interfaces and are consistently coordinated into the data arrange. In the course of the most recent twelvemonth, IoT has moved from being a Synonyms/Hyponyms (Ordered by Estimated Frequency) of noun cut -edge vision with occasionally a specific level of advancement - to an expanding grocery world. Telecom executive think about that Machine-to- Machine (M2M) and the Inter-net of Things are turning into a center business center, revealing critical maturation in the quantity of associated questions in their system. Widget manufactures e.g. concerning wearable convenience foresee a full new business portion towards a more extensive appropriation of the IoT. These geographic expedition results are currently nourishing into advancement, and a progression of segments is accessible, which could helpfully be abused and upgraded by the market. Albeit bigger players in some applications programmable zones still don't perceive the voltage, many them spring careful circumstance or even quicken the gait by begetting new terminal figure for the IoT and including extra-segments to it. Also end-customer in the private and business space have these days obtained a noteworthy capability in managing shrewd gadgets[1] and arranged applications. As the Internet of Things keeps on maturation, promote potential is estimated by a blend with related innovation methodologies and ideas for example, Cloud reckoning, Hereafter Internet, Big Data, Robotics and Semantic cash advance.

 B. Vinuthna, Department of CSE, Koneru Lakshmaih Educational Foundaton, Vaddeswaram, India.
 P. Ravikiran, Department of CSE, Koneru Lakshmaih Educational Foundaton, Vaddeswaram, India.
 A.V.Prabhu, Associate Professor, Department of CSE, Koneru Lakshmaih Educational Foundaton, Vaddeswaram, India.

The 1 sense of think is obviously not new all things considered but rather, as these ideas cover in a few sections (specialized and benefit models, virtualization, interoperability , computerization), veritable innovator see increasingly the part of complementarily as opposed to guarding singular domain .

Characteristics of IOT:

1. Interconnectivity: concerning the IoT, anything can be interconnected with the overall information and correspondence hypothetical record.

2. Things-related administrations: The IoT is fit for giving thing-related advantages inside the farthest point of issue for instance, security protection and semantic consistency between physical Synonyms/Hyponyms (Ordered by Estimated Frequency) of thing and their related virtual issue. With the true objective to give thing-related foundation s inside the jussive state of mind of things, both the ahead movement in physical world and information world will assortment.

3. The device in the IoT are heterogeneous as subject to differing gear point and association . They can associate with other contraption or organization arrange through different association [6].

4. Dynamic changes: The country of wind change powerfully e.g. resting what's more, awakening related and also disconnected and moreover the Set of contraptions including zone and speed. In addition, the proportion of contraptions can change logically.

LAYERED ARCHITECTURE:

The Internet of Things is certifiably not a solitary innovation, is an idea in which most new things are associated and empowered, for example, road lights being arranged and things like installed sensors, picture acknowledgment usefulness, expanded reality, close field correspondence is incorporated into situational choice help, resource administration and new administrations are be done[8]. These bring numerous business openings and add to its intricacy. To oblige the decent variety of the IoT, there is a heterogeneous blend of correspondence innovations, which should be adjusted with the end goal to address the requirements of IoT applications[4], for example, vitality effectiveness, security, and unwavering quality. In this unique situation, it is conceivable that the level of assorted variety will be scaled to a number a sensible network innovation that address the requirements of the IoT applications, are embraced by the market, they have officially demonstrated to be workable, upheld by a solid innovation partnership. Precedents of benchmarks in these classes incorporate wired and remote advances like Ethernet, Wi-Fi, Bluetooth, ZigBee, and Z-Wave are the different type of wireless communication channels that are to be used to transmit the information from one to another like source to destination vice versa. Here we design a system based on internet of things using the node mcu controller to transmit the meter reading values to stored in to cloud, then we are using a web application that can help to see the meter reading values and bill pay, bill history details can be shown in that web application, i.e blynk application can be used to see the final result of this project. Circulation, transportation, turn around coordination's, field benefit, and so forth are zones where the coupling of data and things may make new business forms or may make the current ones exceptionally effective and the sky is the limit from there beneficial.
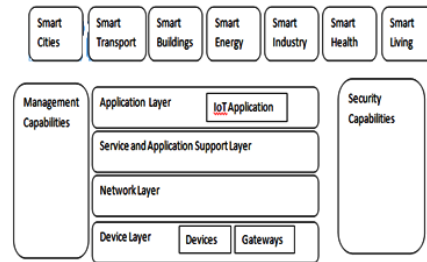

Fig.1 Layered Architecture

III. LITERATURE SURVEY

In the Modern font world, intelligent restraint is adopted in every domain like communication, place gadgetry, medicine etc. Unfortunately, the service provider s of electricity are still using the conventional methods for getting the entropy of zip consumed by the client. The traditional method of DOE m bank noting is a long outdated, inefficient and time consuming one. Technology of e-meter in has gone through rapid technological advancements and there is gradually increasing the demand for a reliable and efficient organizations. That is Automatic Meter Reading processes. This paper presents the design of a very simple low cost of dual mode radio Global System for Mobile based DOE meter and its associated features of making the line of work of metering and the device is easier. The proposed scheme of organization of rules and replaces of traditional meter reading methods and enables remote control access of existing energy meter to the energy provider companies. Also it enables the energy provider to monitor the monthly meter readings without the soul visiting each theater. A GSM based wireless communication module is integrated with electronic energy meter of each entity to have remote access over the usage of electricity. Hence this system of rules has been designed keeping in view the system which is of paramount importance. Then the system can be designed based on the parameters that we have consider and also the time period of bill generation and also user can able to design on what type of actions can be followed.   There exists a charge operation for measure Reading of electrical energy, gas and water supplier companies, as well as to know the intake of particular vehicle by m reading material the meter. Now a solar day, electricity broadside a n d meter reading are very complex tasks. The current method acting of charge process uses manual work of reading the meter, updating 5 senses of detail of meter and sending bill to the client. We are developing a new technology that derives the comprises the existing methodology and new design approach of selective services. To make them meter reading automatically for mobile app if it is used to get the final version of the meter by only the layered design of the networked system. When the optical characteristics of recognition" proficiency on that simulacrum in mobile application.

When the results of is meter capture readings extracted from the captured diagrams &also the arduino board which will process the all the instructions in the micro controller to do files execution. India faces endemic electrical energy and peaking deficit. These shortages have had a very detrimental effect on the overall economic growth of the country. As sum Mightiness losses match transmission might losses plus distribution power losses. The reasons cited for such high losses are; lack of adequate T & D capacity, too many transmutation stages, improper load distribution and extensive rural electrification etc. The reference of transmission power losses may be directly driven by web investment funds or by network operation. Distribution power losses arise from several areas including larceny , un-billed story , and estimated client accounts, erroneousness due to the approximation of consumption by un-metered supplies and metering errors Electrical energy thievery can be in the form of fraud (meter tampering), stealing (illegal connections), billing irregularities, and unpaid bills. Estimates of the extent of electrical energy theft in a sample of 102 countries are undertaken. The evidence shows that theft is increasing in most regions of the man. Electricity consumer dishonesty is a problem faced by all power world utility. Finding efficient measurements for sleuthing fraudulent electrical energy consumption has been an active research area in Holocene epoch years. Data mining has become increasingly common in both the public and private sectors.

IV. THEORITICAL ANALYSIS

There exist a charge operation for measure Reading of electrical energy, gas and water supplier companies, as well as to know the intake of particular vehicle by m reading material the meter. Now a solar day, electricity broadside and meter reading are very complex tasks. The current method acting of charge process uses manual work of reading the meter, updating 5 senses of detail of meter and sending bill to the client. We are developing a theory of embedded system that can be help to automatically generation of a system that can help to reduce the man power and also time period. Selective data that should be transformed in to into web application that should be processed by the controller to generate the bill. To makes them meter reading can be automatically taken from android app is used to get the version from the meter by only capturing the capacity range and function of the meter and then playing the ocr, when the optical characteristics recognigation" proficiency of that simulation in mobile app. when using the node mcu microcontroller we can collect the information from the device that which can be passed through the network and it can be uploaded in to the cloud, then we can give permission to the consumer that we can access the generated bill.

Problem Analysis:

Today's electricity board departments have maximum issue on to create and generation of the bill for the consumers, so manually peoples are work together to get the meter reading from the electrical meters, the department has paid money for those people and also to spend time for that. So here we can observe two things those are money and time. In this paper we can propose new scheme for these problems like generation bill and reading the meter reading for the customer that can be delivered through the short message or else we have to provide a printer that should be writing meter reading meter value in the meter.

EXISTING SYSTEM:

The electric current operation is that measure lector clicks image of the meter using digital camera and submits that image to the decision maker and then performing manual of arms of arms operation to extract textbook from icon and poster generation process is carried out. The ship's company that uses manual task for hand billing purposes thinks that it is an easy task and acquirement are not important, so these companies don't invest a huge sum of money of money for a new solution[5]. With the current procedure followed by these companies to calculate bills the customer has to font many problems. According to customer's perspective of knowing their current expenditure unit of measurement or calculating it manually is not provided. Also the facility to equivalence the previous calendar month's consumption units with the current month are not provided. when the data or information that should be collected at the e-metr and it will process soon the entire network through the channel, then the bill arrive at the application whatever you should used and registered in the time registration in the network.

For this usage we have reduce latency from the workers and manual mistakes of the reading persons in the electrical department. Customer has to face many difficulties in contacting with companies for making any charge about device bankruptcy or incorrect bill. Companies doesn't provide proper communicating distribution channel [10] for broadcast medium information about mogul failure and power consumption to the customers. Difficulties in Existing System:-

➢ Time consuming to take physical processing.
➢ Totally manual operations only.
➢ Lots of employees and time.
➢ Different types of mistakes due to take readings.
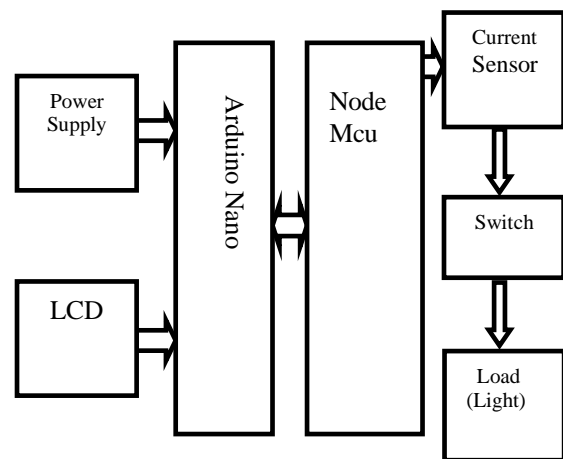
V. PROPOSED SYSTEM

Fig.2 Illustration of Block Diagram

We are developing the android application and a web application. Android app is only for cadence reader to get the meter reading. This root is more beneficial for meter subscriber. At the starting time of the daytime meter reader carries android Mobile River including android app in it to get the meter reading within a day. The hardware circuit produces an automated meter reading system.

Smart Electricity Bill Generation using Mobile App

When the power supply is connected to the current sensor it will read the how much amount of current that should be pass through the sensor and it will send that information in to microcontroller and it is frothily processed by the controller. The android application for the electricity board personnel is created with the facility to receive user what is the current month bill and how much amount of units we are used like all the information van be clearly observed in the bill. Here we design a new system for automatic electric bill generation system using the current sensor how much amount of current can be passed through the load, and that data should be processed to the microcontroller and it send to the cloud, we can access the a mobile application to retrieve the data from the cloud and it will appear an web application.

VI. EXPERIMENTAL RESULT

Fig. 3 Before Implementation
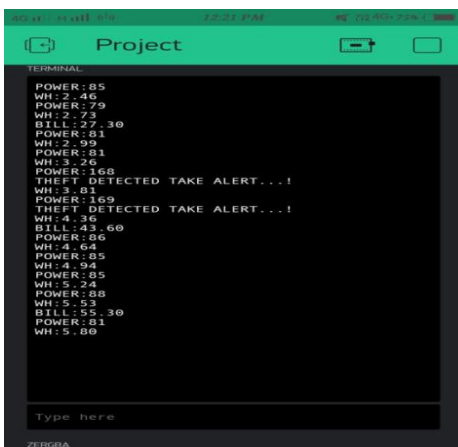

Fig. 4 After Implementation
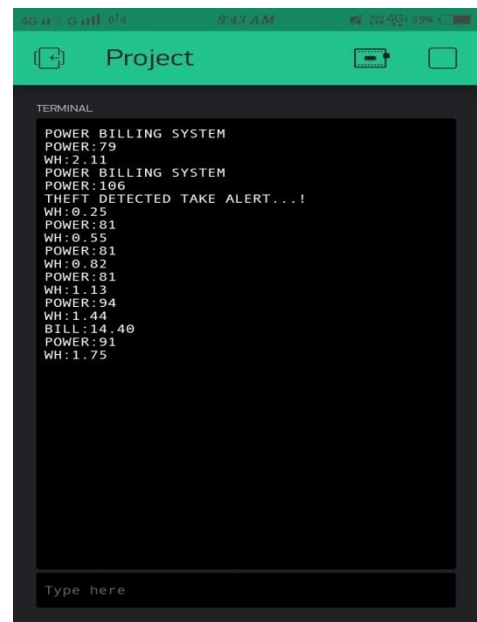

Fig. 5 Results using Tool

Fig. 6 Results using Tool

VII. RESULTS

We are developing the android practical application using the blynk. Android app is only for cadence lecturer to get the current meter reading also it will detects the electricity theft and alerts of the company owners about the Theft happened in particular line and particular time. So this root is more beneficial for meter in do consumer. At the starting time of the day time meter reader carries the Mobile including android blynk application in it to get the meter reading within that day in this application. I have made the system in way that It gives bill for every 5 readings and also alerts us when the power theft is happened in that power line.

VIII. CONCLUSION

The current method of billing process it can includes the manual process of meter reading, entering meter details at the server and billing to the customer our application is only for automatically meter reader that reduces the workload on employees and to shuffling the process of getting the meter reading and also maual mistakes of the humans, updating server and billing to customer via network is shuffle easy and accurate and also we have provided the facility for the customers that they can charge about the incorrect bill to our web application in addition to the we have also made a set up which detects the Electricity Theft and gives the information to corresponding departments about it the we can take the measures like not supplying power to that particular line and detect where the power theft happened or not.

REFERENCES

1. R. Jiangama, L. Tagarishana, M. Lachsz, and L.Jeffreyana, "Wavelet Based fixed Extraction and Multiple distractions of Classifiers for Electricity Fraud Detection" in Proc. of IEEE paper Conference and Exhibition 2008: Asia Pacific,Vol. 9, pp. 143-145.

2. H.B Sathnaya kamma, "wifi based automatic bill generation system", International Journal of Scientific and Technology, volume. 10,pp.no 9-12, 2015.

3. Emmanuel deenis, Christian jacob,"The Examination of the Effective of Electricity Billing System and the Active data miningin" , Global Journal of Research and development in Engineering, volume.3, Issue 10, pp.no. 62-70, 2013.

4. D. nanina,"The top level down approach of Power Meter Reading & Billing System using mobile phone", volume. 4, pp.no. 178-182,2017.

5. Rani Gowri, "The design and Android Application of the for Research and science in Engineering Application & Management, volume 4 Issue 18, 2012.

6. L. Patilammana, and Vnyanesh R.R Bondar lawan, Roshiani Priyanka, "Energy Meter with operational Advanced Billing System and Electricity Theft Detection and formula", volume 5, pp.no 5-12,2003.

7. Masuduraran khaja, Md. Serazus Salakanna in," The design Arduino nano board and gps system for theft detection System and devices," Bangladesh 2010.

8. B.B Das jana, "Wireless communication system for electrical energy meter data capturing", Advances in Recent Technologies in Communication and Computing 2005. K.J. Newsbuery, Wk. Millter, "Multiprotocol routing for automatic the remote data systems", IEEE transactions on power delivery, vol. 16, no. 1, pp. 1-5, 2001.

9. W.O. Veerababu, W. rani, W. samuel Abednego, "Electrical Power Measurement Using Arduino Mega Microcontroller and LabVIEW"2013", 3rd International Conference on Instrumentation Communications (ICdjICI-BMEdk)226 Bandung, November 7-8, 2016.

10. V.V Mehta rani, Bhavika lalila. Prajapati, Umangan janus. Sharad, "Advance Featuring and Smart Energy Meter With Bi-Directional Communication", International Conference on Electrical Electronics and Computer and electrical-10th. 2005

11. Lakshmi M, Mr. joshi Paramert, "The new Power Distribution to HighTransmission Line" International Journal Of Computational Engineering Research, vol. 9, no. 5, pp. 123-143,December 2016.

12. Dodwinsla. megaha, "System Design and Simulation results of Single Phase Intelligent Prepaid",Innovative Systems Design and Engineering, vol. 4, no. 1, pp. 1-10, november 2018.

13. "The Embedded system Energy Meter I s- By A device parametrses Consumer And To Pay The Bill", Proceeding of Joint International Conference on Power system Technology and IEEE Power India Conference, pp. 9-12, 20010.

14. Junaio. Baverao, Nyan. Jiang, "Proposed Design of the new generation system of transfers which based upon GPRS",asia 2011.

15. O. G. Kuynhana, U. K. Tananayana, "System management for power usage and power control for smart LED lighting system control", SeCON 2016–37th Annual Conference on IEEE Industrial Electronics Society. IEEE transcation , 2009.

16. V. Megahan, Bhanika. jumang. jharadani, "The advance Featuring of smart Meter With Bi-Directional data Communication", International Conference on Electrical Electronics Engineering and technology.

17. I. Jain kyan and T.S.Remmy "Algorithm of bill generation system automatically", IEEE transaction volume. 7. Pp.no 70-78, 2015.

18. Z. Tonritz, O. Wangano, K. Zuonox, R. Kuekena, "Top design model of safety and security for transmission of power lines" S. joint Conference of the Fourth International Conference on, volume. 8, pp. 110-116, 2014.

19. Ad. Ahmed Naik, A. R. U. Haque, "Implementation of Design and implementation of using usb gprs/edge modem", Electronics Computer Technology (SOC) 2012 3rd International Conference on, volume. 7, pp. 220-225, 2018.

20. K. Saiman, L. Krissakanth, and, P. Muvungi, "The energy meter reading and theft detection system using iot", 2010. 10th Conference in Africa, volume. 5, pp. 16-25,2013.