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ELECTRICITY BILL GENERATION AND AUTO POWER SUPPLY DISCONNECT USING IOT

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Abstract: An electricity monitoring and power off system that allows users to check the electricity theft and bill payments monitoring. The project provides auto bill generation and bill monitoring and make power off using IOT. The main scope of this project is to create smart IOT based energy meter which is used track energy consumption via WIFI module. We can send the data of the energy consumed to the mobile phone in the form of SMS. We can get data of the energy consumption on time requirement basis consumption basis. Some of the issues of the existing systems are Every time we cannot check the meter and figure out the energy consumption manually. In digital meters only the amount of energy consumed is displayed there is no past energy consumption history. In our project consumption of electricity can be monitored remotely. It could generate more accurate bills. We can also control the load (on/off) by sending a message also the bill will be generated after load is turned off. SMS can be sending to both the customer and the authorized electricity board, so that they can update the bill in online and user can pay via cashless transfer which will be useful in hard times (lock down). The Smart Electricity Monitoring and Power Disconnection System leverages the power of IOT technology to streamline electricity management. It promotes efficiency, convenience, and environmental sustainability. With remote monitoring, automatic billing, and power control at the user's fingertips, this project not only benefits individuals and households but also contributes to a more sustainable and accountable energy infrastructure. By mitigating electricity theft and enhancing transparency in billing, this project represents a significant step towards a smarter and more responsible approach to electricity consumption. Overall, this project harnesses the power of IOT technology to streamline the electricity management process, making it more efficient, convenient, and environmentally friendly.

KeyWords - Direct Current, Power supply, Global System for Mobile communication ,Internet Of Things, Integrated Circuit ,Liquid Crystal Display.

I. INTRODUCTION

The IOT-based electricity bill generation and auto power supply disconnect system is to create a comprehensive solution that seamlessly integrates smart meters and sensors to monitor electricity consumption in real-time. This system aims to collect and transmit data to a centralized platform for analysis and billing purposes. It will allow users to access their bills through a user-friendly interface while offering the convenience of making payments electronically. Additionally, the system will incorporate an automated power supply disconnect mechanism, enabling remote control for disconnection in cases of non-payment or predefined criteria. The project will focus on ensuring data security, regulatory compliance, and energy efficiency, all while providing a scalable and userfriendly service. Continuous feedback and improvements will be integral to enhancing the system's performance and overall user experience. the IOT technology to automate electricity bill generation, provide real-time consumption monitoring, and enable auto power supply control. It

enhances billing accuracy, user insights, and promotes cost-efficiency and sustainability while supporting responsible energy consumption and environmental conservation. The management of electricity consumption by integrating cutting-edge IOT technology into the process. It automates the traditionally manual and error-prone billing system, ensuring accuracy and efficiency in calculating electricity bills. Real- time monitoring of electricity consumption provides users with instant insights into their energy usage patterns, empowering them to make informed decisions about energy conservation. The system's unique feature is the ability to remotely control power supply, promoting costefficiency by allowing users to manage their electricity usage in a convenient and sustainable way. By connecting sensors, micro-controllers, and cloud platforms, this project creates a user-friendly interface for easy bill access and power control, enhancing the overall user experience, the project not only seeks to reduce costs for consumers but also to encourage responsible energy consumption.

II. LITERATURE SURVEY

Rajathi N et al., [1]Proposed,"Automatic Electricity Bill Generating System" The traditional way of reading energy meter is an expensive work where the reader of the meter has to go in person to each meter and take the meter reading manually. That manual reading goes into the billing software to generate the bill to automate the payment process .That method of reading has short comings, such as reading error and involves more labors. To overcome this issue, an automatic power meter reading and billing system is proposed. Automation of energy meter reading and billing data entry process would reduce the laborious task and financial wastage. The proposed work measures the energy consumption in each house and generates the bill automatically with Arduino and Wi-Fi. The main goal of this work is to reduce the energy consumption in houses by notifying the owner continuously about the amount of units that are consumed. The goal of this work is to automate the billing process by checking the electricity unit's consumption in a house and hence subsequently reduces the manual labor. The calculations are carried out automatically and the bill is updated on the Internet by the help of Wi-Fi. The bill amount can be checked by the owner anywhere and at any time by visiting the website or the online portal. the authors proposed methodology for reading electricity meter measurements remotely using Short Message Service (SMS).The SMS have been received using the Global System for Mobile communications (WIFI) networks. Handoko Primicanta et al. proposed hybrid Automated Metering Reading System(AMR). This system combines both ZigBee and WIFI technology. The data collector unit will be connected to the central computer by using WIFI and the ZigBee module is attached to the electric meter.

Prof. Ruhi Uzma et al.,[2]Proposed,"IOT Based Automatic Electricity Cut-Off" The Utilities in electricity system are destroying the amount of revenue each year due to energy power theft. It causes shortage of power supply to residential as well as commercial premises. The aim of the project is to design and control a system which will automatically cut-off the electricity connection directly from the electricity pole for those consumers who fail to pay electricity bill on time. When T.N.E.B officials arrive at that particular site to cut-off the supply, some consumers argue with the officials and try to settle the matter by giving bribes. Even if after disconnecting the supply, some consumers may bypass the system and connect the home appliances from the service mains. So to overcome all these issues a prototype is proposed which includes WemosESP8266, relays through which it will automatically cut-off the electric supply as per given instruction by micro-controller from the pole 3 itself for that particular consumer who does not pay electricity bill within a specific given period. Also power theft will be taken care by this proposed Smart energy controlling system.

A.Srinivasa Reddy et al.,[3]Proposed," Automatic Electric Bill Generating System Using WIFI Module" The Energy meter connected to the load and it displays the energy consumed by the load when the power is supplied .We can observe the units in the energy meter, sometimes user will face the difficulty to read the units. To solve this problem, User will send the message to the user how much units was consumed. For this Energy Meter is connected to the Arduino, now the
bill is generated in it. in Arduino consists of predefined data which helps to generate the bill. The data was written in the form embedded C program which was inserted in the Arduino. The bill generated and the units can be observed in LCD. And the units and bill generated was send to the mobile phone by using ESP8266 WIFI module. To observe the units and bill in the mobile phone, user need to install the telnet app from the play store. And next connect to the WIFI in the user mobile. Next open the telnet app and enter the IP address and port number of the WIFI module. Finally after entering the IP address, user can observe the units and generated bill in mobile phone. If the IP address was entered to observe the data in telnet application. So while entering the IP address user need to enter it correctly. The user can observe this any time by entering the IP

address in telnet app. In this user can also reset the data, by this the process user start from the first. The readings will count from the start. By knowing the units consumed by the user can understand where he was consuming more and where he was wasting electricity. The appliances from this app to reduce this problem. By giving commend it can on or off of the appliances by using relay. By using the relay,It can turn on or off the appliances like bulbs. when the user command in the app like "*1#" based on the information stored for that command in Arduino the relay will work. So the user will save electricity. By this we can observe data and control the appliances. we take help of LDR sensor for unit count. It increases the units based on the light intensity. It is difficult to observe the readings from the meter manually.

III. SYSTEM DESIGN

The design of the system includes power supply, Micro-controller, Esp8266 Wi-Fi module, Relay, Switch, LCD display. The load is driven by the relay which is connected to the Micro-Controller and an Energy Meter, Wi-Fi modems to introduce Smart concept.

The Wi-Fi modems assist the consumer to monitor the consumed readings. This system continuously monitorsthe energy meter and calculate the amount of units consumed and according to the consumed units the bill gets generated which can be accessed by the consumers on Blynk App. The units in the energy meter can alsobe shown by the Liquid Crystal Display i.e LCD.

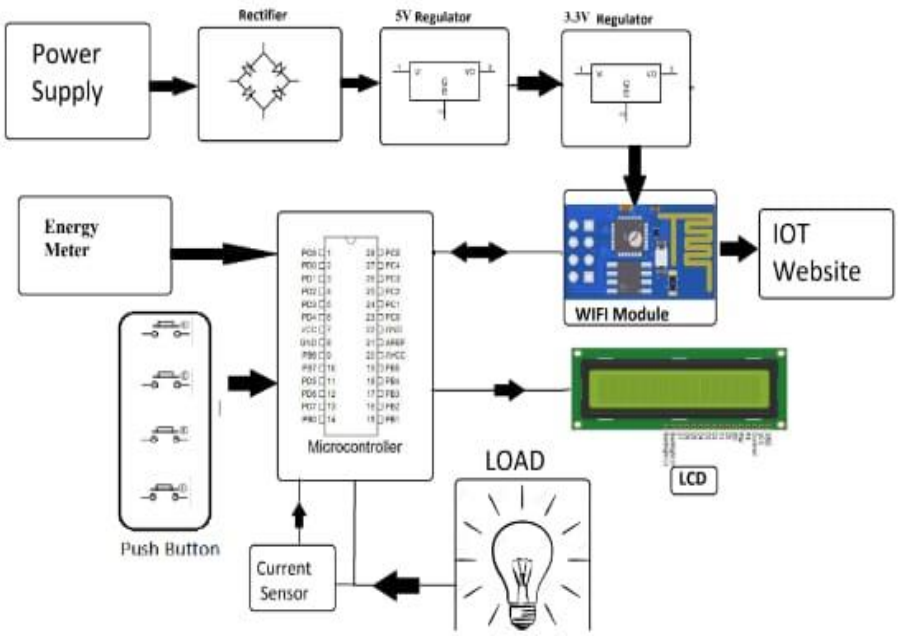

Fig 1. Architecture Diagram

IV. METHODOLOGY

The implementation of an electricity bill generation system coupled with automatic power supply disconnection u

using IoT technology requires a systematic approach. Beginning with clear requirements definition, the project progresses through hardware selection, sensor integration, data acquisition, and processing, culminating in the development of algorithms for bill generation and automatic disconnection criteria. A user-friendly interface and robust IoT connectivity facilitate remote monitoring and control. Thorough testing, validation, and deployment ensure system reliability and accuracy, with ongoing maintenance and iteration driven by user feedback. By following this methodology, the project aims to optimize energy management, enhance user experience, and promote efficiency in electricity usage. The successful implementation of an electricity bill generation system coupled with automatic power supply disconnection using IoT technology

necessitates a meticulous approach. This involves delineating precise project requirements, followed by meticulous hardware selection to ensure compatibility and functionality. Integration of sensors for accurate data acquisition and processing forms the bedrock, enabling the development of sophisticated algorithms for bill calculation and automatic disconnection thresholds. Concurrently, the creation of an intuitive user interface and establishment of robust IoT connectivity facilitate seamless remote monitoring and control, enhancing user accessibility and system efficacy. Continuous maintenance and iterative improvement, guided by user feedback, ensure sustained performance optimization and user satisfaction. By adhering to this comprehensive methodology, the project endeavors to revolutionize energy management, fostering efficiency and sustainability in electricity consumption.

V. WORKING

The system's functionality begins with the meticulous acquisition of electricity consumption data by highly sensitive sensors embedded within the energy meter. These sensors continuously monitor various parameters such as voltage, current, and power factor, providing a comprehensive understanding of energy usage patterns. This raw data undergoes intricate processing orchestrated by the microcontroller, where it is analyzed, aggregated, and converted into meaningful insights about energy consumption trends. Once processed, the data is seamlessly transmitted through the WIFI module, leveraging robust communication protocols to ensure reliable and realtime monitoring capabilities.From retrieving detailed consumption metrics to remotely managing household appliances, the system empowers users to make informed decisions tailored to their energy needs. Billing becomes a streamlined process as consumption data is meticulously analyzed to generate accurate and transparent billing statements. Moreover, the system facilitates remote load control, allowing users to effortlessly manage appliance usage and optimize energy efficiency from anywhere, at any time. Security remains paramount throughout the system's operation, with robust authentication mechanisms ensuring that only authorized users access sensitive features and data. Continuous monitoring and regular maintenance services ensure the system's reliability and functionality, providing users with peace of mind and uninterrupted service. In essence, the electricity monitoring and power off system epitomize the convergence of cutting-edge technology and usercentric design, revolutionizing the way energy is managed and consumed. Its seamless integration, comprehensive features, and unwavering commitment to efficiency and security make it an indispensable tool for modern households and businesses alike.

VI.DESCRIPTION

The comprehensive overview of the development lifecycle for an energy management system, detailing six key modules: Requirement Analysis, System Design, Development, Integration and Testing, Deployment, and Maintenance and Support. Requirement Analysis involves identifying project objectives, stakeholders, and user requirements, while System Design encompasses both hardware and software aspects, specifying components, circuitry, algorithms, and user interface design. Development entails hardware implementation and firmware/software creation, while Integration and Testing ensure seamless operation through various testing methodologies. Deployment involves installing the system, configuring settings, providing user training, and monitoring initial operations. Lastly, Maintenance and Support cover ongoing services, technical assistance, software updates, and documentation maintenance to ensure smooth system operation over time.

VII.CONCLUSION

In conclusion,The automation of the electricity billing process has ushered in a new era of accuracy and efficiency, significantly reducing the risk of human errors in manual meter readings. This precision has streamlined utility provider operations and enhanced consumer trust, reducing billing disputes and improving overall billing accuracy. The introduction of real-time monitoring has empowered consumers with immediate insights into their electricity consumption, transforming the way they engage with energy usage. This newfound awareness leads to informed decisions, cost savings, and a more environmentally conscious approach. It's a crucial step toward promoting sustainable energy usage and reducing the environmental impact of energy consumption. Perhaps the most remarkable achievement is the integration of remote power supply

control. This innovation places control over energy consumption directly into the hands of consumers, offering unparalleled convenience and encouraging responsible energy usage. Users can now make immediate adjustments during peak demand, contributing to a culture of energy efficiency. Users have the power to reduce their carbon footprint, promote environmental conservation, and actively engage in the global effort to combat climate change. The integration of remote power supply control is a standout achievement, offering unparalleled convenience and encouraging responsible energy usage. Users now have the tools to manage their electricity consumption efficiently, make immediate adjustments during peak demand, and foster a culture of energy efficiency. This project has the potential to user in a new era of sustainability, empowering users to reduce their carbon footprint and contribute to environmental conservation.

VIII.RESULT

The proposed system represents a cutting-edge approach to Breast Cancer detection and treatment, leveraging the power of deep learning, embedded systems, IoT, and sensor technologies. By employing convolutional neural networks (CNNs), the system extracts intricate features from medical images of the breast, enabling precise classification of BCD. This advanced image analysis capability facilitates early detection of breast cancer, a critical factor in preventing complications such as infections and tissue damage that could lead to amputation. Furthermore, the integration of IoT-enabled sensors allows for real-time monitoring and analysis of breast health, providing healthcare professionals with valuable insights into the risk of Breast Cancer development for individuals. Upon identifying a Breast Cancer, the system initiates therapy using Peltier crystal technology embedded within the system. This innovative treatment approach aims to mitigate the progression of breast cancer, thereby improving patient outcomes and reducing the need for more invasive and costly interventions.

Fig 2. Hardware Output

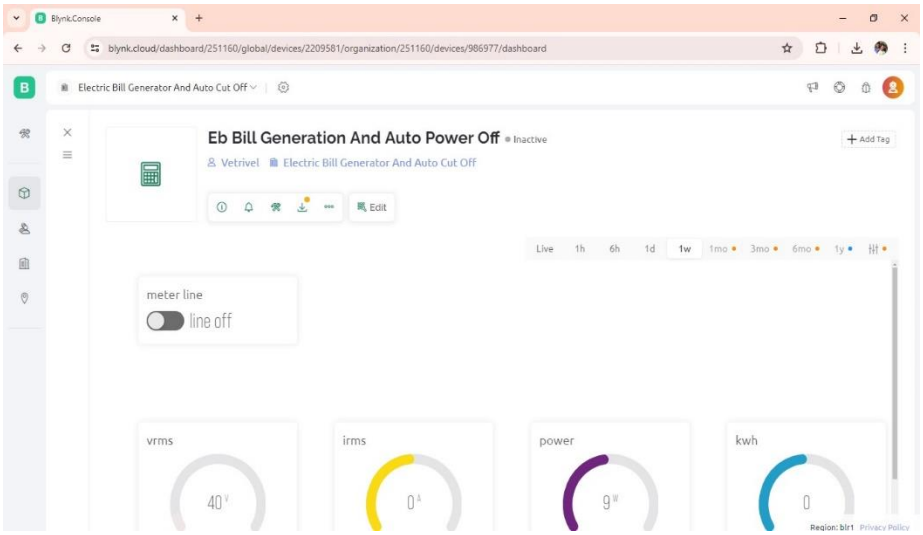

Fig 3. Software Output(Meter On/Off)

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