SMART POWER CONSUMPTION ANALYSER AND CONTROLLER - A SURVEY

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*Abstract:*While the cost of living continues to rise, there is a rising emphasis on using technology to reduce those costs. With this in mind, this project enables users to construct and manage a home that is smart enough to conserve energy. In this project, we plan to build firmware for smart control that can be successfully automated while minimizing human contact in order to maintain the integrity of entire electrical devices in the home. Wireless technology is used in the main control system to provide remote access via cell phones. Controlling all electrical appliances, checking the room quality inside the home, and analyzing the power usage in units for various devices are just a few of the functions offered by our project. For persons who have a habit of forgetting things, controlling electrical appliances such as a washing machine is a good idea. The state of the system can be tracked based on user requests. With a low-cost design, a user-friendly interface, and ease of installation, the system is meant to control electrical appliances and devices in a home. The status of the appliance, as well as control via a web application, would be available. This approach is intended to aid and support the elderly and disabled in meeting their requirements at home. Furthermore, the smart home concept raises the standard of living reception.

Index Terms **- Google Voice Assistant, GSM, IoT, Power consumption analyzer, Smart Automation, Wi-Fi.**

I. INTRODUCTION

Internet of Things (IoT) is a concept where each device is assigned to an IP address and through that IP address, anyone makes that device identifiable on the internet. The mechanical and digital machines are given unique identifiers (UIDs) and therefore the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. The recent developments in technology that permit the use of wireless controlling environments like Bluetooth and Wi-Fi have enabled different devices to have the capabilities of connecting. While the value of living goes up, there's a growing focus to involve technology to lower those prices. So, keeping up with the current trends in technology we have decided to come up with the project named Smart Power Consumption Analyzer and Controller which adds to the standard of living of a common man. With this in mind, the Smart Power Consumption Analyzer and Controller allows the user to build and maintain a house that is smart enough to keep energy levels down while providing more automated applications. A smart home will cash in of its environment and permit seamless control whether the user is present or away. With a home that has this advantage, you'll know that your house is working at its best in energy performance. By implementing this technique, it's possible to explore a spread of various engineering challenges, including software programming, PCB design, Wi-Fi, TCP/IP protocols, Web Server logic design, and other aspects. This automation system provides great insights into the challenges of software and hardware design. With this in mind, an internet-based home automation system for remote and observing the status of home appliances is meant. home. Also, the smart home concept within the system improves the quality of living at reception.

Our project provides many features such as controlling all electrical appliances, checking the room condition inside the home, and analysing the power consumption in units for various devices. Controlling electrical appliances like washing machines for the people who usually tend to forget things. Based on user requests the status of the machine can be monitored.

II. METHODOLGY

Initially, we began gathering requirements by consulting a number of other existing projects. We learned from those projects that the majority of the applications only provided the ability to turn on and off various electrical components. To make these types of applications more practical, we decided to provide control capability, which allows you to change the characteristics of each device. We also included a power usage analyser module.

We are creating a low-cost user-friendly application with this project that allows one to quickly operate many devices while also identifying the power spent by each item. It allows users to take the required precautions in terms of power conservation, thereby helping the environment by conserving energy, and it also has Alexa and Google Assistant integration to make it more user-friendly. The user interface design was completed after the requirements were identified. The database design for the user interface was completed. The connection between the user interface and the database was completed. After the connection was

established, the connection was verified and validated. The PCB was wired with a variety of sensors, including a humidity sensor, a sunshine sensor, a temperature sensor, a voltage sensor, and a current sensor. The connection of the aforementioned sensor to PCB was verified and validated. After that, the relay was connected to the audio system. The IoT Power Relay is a controllable power relay with four outputs that aids in the creation of a secure and dependable power control system for Internet of Things projects. After that, the electrical appliances were connected to the relay. With the help of PCB, the appliances are verified and validated. The above link has been verified and validated. To communicate data from PCB to the database, an API was created. The API was used to connect the Node MCU. The sensor data was verified and validated, and the system's operation was monitored. The user access model, view, controller, and were all built and linked to the access card. API was used to connect to Alexa and Google Assistant. After that, the model was put to the test.
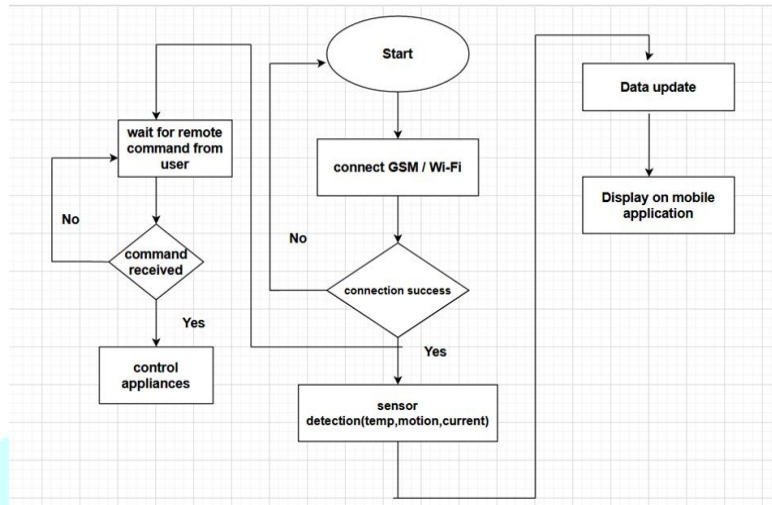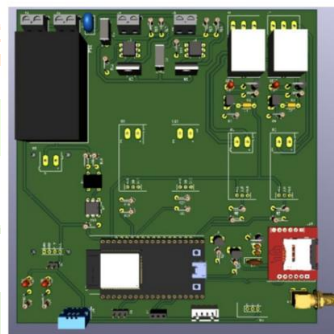

Fig 2.1 Flowchart

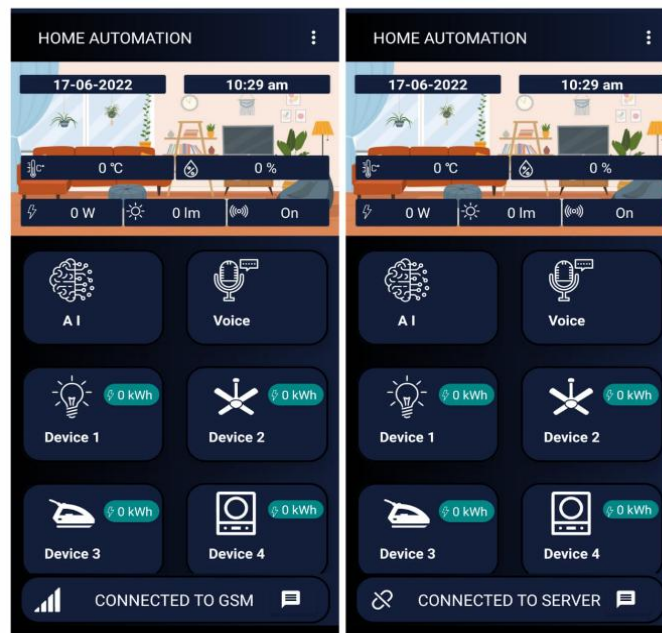## III. RESULT

Fig 3.1 Hardware Layout

Fig 3.2 User Interface

IV. DISCUSSION

According to the research, a variety of solutions are available that enable home automation via various types of apps. Home Automation is only regarded accessible by those with a greater net worth due to the high cost of devices now. As a result, it is regarded as an extravagance. As a result, we decided to develop an additional module, in addition to automation, for determining the amount of energy utilized by every equipment in the home. People can use this feature to detect gadgets that use a lot of energy and take the required steps to reduce their energy consumption and save money. Reduced energy consumption lowers demand for fossil fuels and, as a result, lowers carbon dioxide levels in the atmosphere.

V. CONCLUSION

This type of project improves people's living standards at a minimal cost, as well as assisting physically challenged persons in enhancing their cerebral thinking and keeping them up to speed on the latest technologies. It enables them to conveniently control multiple gadgets while also conserving energy and contributing to the environment. The project's front end is built on the Android Studio platform, which also gives users the ability to add new features as needed, increasing the project's future expandability. It turns out to be a very cost-effective and user-friendly solution that can be used across a wide range of industries. The suggested system employs a variety of communication mediums, including Wi-Fi, Bluetooth and SMS for those who do not have an Android phone.

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