



A SECURED SMART HOME SWITCHING SYSTEM BASED ON WIRELESS COMMUNICATIONS AND SELF-ENERGY HARVESTING

¹Vrushali Kedar, ²Tapre P.C, ³Solanki A.

¹PG Scholar, Department of Electrical Engineering. SND COE &RC Yeola, Nashik

²Assistance Professor Department of Electrical Engineering. SND COE &RC Yeola, Nashik

³Assistance Professor Department of Electrical Engineering. SND COE &RC Yeola, Nashik

amitthorat513@gmail.com

ABSTRACT: -The world is changing into a cleaner and more sustainable energy system. In private and public buildings, there is a desire to reduce electricity usage, automate appliances, and optimize the power use of a structure. The plan is set up for the robotization of stalwart framework. It tells the best way to distantly control and screen power, naturally remove power on and off. In view of human effect and its unfriendly results on the world's present condition, the world is changing into a practical energy structure. In both private and public designs, there is an aching to diminish power use, motorize machines and improve the force utilization of a construction. To execute this, the remote advances utilized are Rpi module, Node MCU module and different module. The design and implementation of a secured smarthome switching system based on wireless communications and self-energy harvesting is presented. The results got from testing of the model shows an improvement in security and energy the management.

Keywords: - Self-Energy Harvesting, Raspberry pi, NodeMCU, Electricity

I. INTRODUCTION

The smart home and accessible shrewd gadgets become progressively famous, the vast majority do will in general require more solace and home computerization gadgets to update their living spaces to appreciate a cutting edge life, henceforth, prompting the interest to furnish the houses with various a sort of sensors and actuators for ideal security and simplicity of machines control. In



numerous nations correspondence based controlling and monitoring engineering is utilized to save power and have finders and recorders to record power. Correspondence through wired interfacing and interconnection is very caught and fundamental to present while this system far off interface is used considering the way that it's easy to introduce and advanced than the past one. Diverse gear methods are used for power controlling and monitoring. A item module is arranged here by the help of PHP, JavaScript, HTML and CSS which upholds client to handily screen the electrical plug's condition that whether it is on or off. The far off controlling of electric apparatuses gives the capacity to control through web and the advanced mobile phones which is connected to worker module to get the control order or directive for power the executives anyplace and whenever at any time.

1.1 OBJECTIVES

To implement security (access control system) for a building's power supply. To harvest and store energy for all the active electronic devices using a photovoltaic system with wireless communication for smart switches and sockets.

II. LITERATURE SURVEY

The developed a system where they had focused on various approaches which found to be helpful for energy conservation. Also, energy harvesting system implementation using new technologies like IoT, ANN are explored here. [1] Present an IoT network system for connected health and safety applications for industrial outdoor workstation where arrangement was able to monitor both physiological and environmental data forming a network from wearable sensors attached to workers' body and provide priceless information to the system operator and workers for safety and health monitoring.[2]

System focused on information security, big data, mobile networks, cloud computing, and the Internet of Things. Security effectiveness can be upgraded by utilizing a Secure Hash Algorithm 256 (SHA-256), which is a verification component that, with the assistance of the client, can confirm every association of a given gadget with a Webserver by utilizing a scrambled username, secret phrase, and token. This structure could be utilized for a computerized robber caution framework, visitor participation checking, and light switches, which are all effortlessly incorporated with any keen city base [3].

Proposed a privacy protection scheme based on information hiding, the scheme guarantees the sensitive data transmitted securely. First, the smart home Real-time sensor data are classified into sensitive data and non-sensitive data through machine learning, the process can be controlled according to the user's preferences. Second, the sensitive data can be transmitted securely by ordinary channels using method of combination encryption with information hiding [4]. Proposed Wireless Power and Data Transfer (WPDT) framework is additionally equipped for working under a wide scope of information rates. It's anything but a greatest information pace of 3.33 Mb/s for a most extreme force conveyance of 6.1 mW at 1 cm curls division distance. The framework can recuperate more force, coming to 55 mW at 100 kb/s. Because of the framework genericity, an administrator can choose the best trade off among force and information rates in agreement to application or current need, without reconfiguring the beneficiary. Another benefit of this balance method is the straightforward execution and the super low force utilization of the CWM demodulator in spite of its high velocity demodulation. [5].



Proposes a low-power farm environment detection system based on LoRa wireless technology. Which use various sensors in the laboratory to complete the detection of soil and model environmental parameters, and implement lighting control and irrigation control, cooling control and man-machine control. The designed system sleep current is as low as $0.3 \mu A$, the average working current, has the advantages of long transmission distance and low power consumption. After verifying the feasibility of the technology through an experimental model, the system was applied to a specific greenhouse and data collection and analysis were completed. [6]

Their Contribution two sorts of plan of smart home frameworks. 1) A pragmatic plan and execution of safety (access control framework) for a structure's force supply which adds a locking highlight with the end goal that lone approved staff are fit for changing the force condition of the savvy attachments and switches in a structure, and; 2) A model of energy collecting and capacity framework for the dynamic electronic segments of the hardware

III. IMPLEMENTATION DETAILS OF MODULE

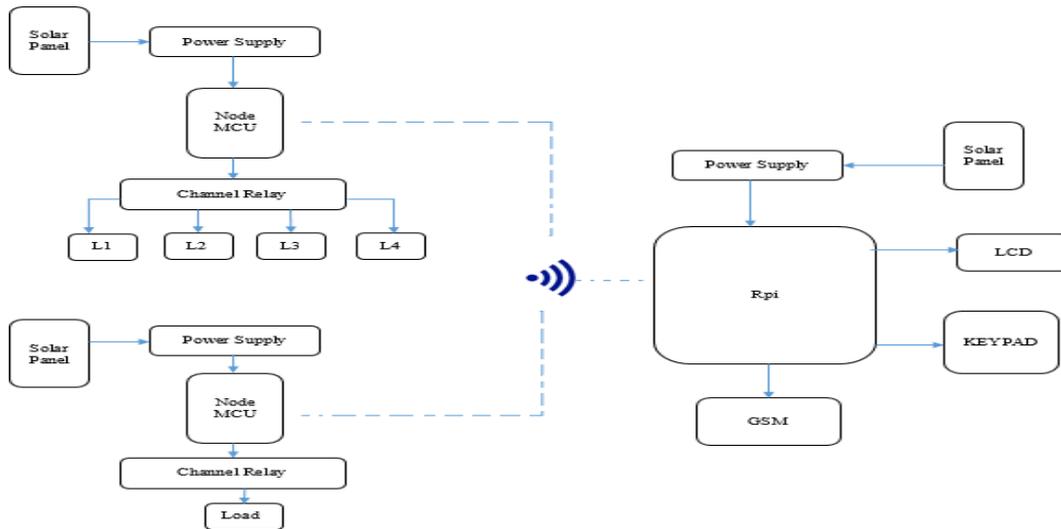


Fig 3.1:- System Architecture of Proposed System

The system is combined with Solar panel, power supply, Raspberry pi, keypad, LCD, GSM. The Solar panel is the energy source for Raspberry pi, where the harvested energy from solar is given to power supply and afterward to Raspberry pi. To control physically the framework utilized keypad 3*3. The heap Status and voltage is shown on 16*2 LCD, and for remote correspondence framework utilizes modules named GSM. The keen home switch goes about as a far off switch that can be turned on or off either by orders remotely sent from the shrewd center point or genuinely by a client. Force supply, hub MCU, hand-off, load is utilized. The client solicitation will be first given to Raspberry Pi and afterward utilizing TCP/IP to hub MCU. As per that hand-off will be on or off so power will be saved. In the following hub a similar technique is carried out, just we added some more loads to relay.

IV. CONCLUSION

Thus System present the design and implementation of a secured smart home switching system based on wireless interchanges and self-energy gathering where we have utilized different sensors like raspberry pi, hub mcu, and so on The framework here access control of the power, energy collecting, and capacity for the active electronic components of the circuitries, and wireless communication for smart switches and sockets.

REFERENCES

1. Ms. Dhanshree Barge, A. R. Surve, “A Review on Energy Conservation System with IoT Oriented Technique”, International Research Journal of Engineering and Technology (IRJET), 2020.
2. Sabrin M A, Angel P Mathew, “Literature Review of Design and Implementation of a Wearable Sensor Network System for IoT-Connected Safety and Health Applications”, International Research Journal of Engineering and Technology (IRJET) ,2020
3. Tran AnhKhoa and Hoang Hai , “Designing Efficient Smart Home Management with IoT Smart Lighting: A Case Study”, Hindawi Wireless and communication , Research Article , 2020
4. Lina Yang and HaiyuDeng, “Preference Preserved Privacy Protection Scheme for Smart Home Network System Based on Information Hiding”, IEEE Access, 2019
5. ArefTrigui and Mohamed Ali, “Generic Wireless Power Transfer and Data Communication System Based on a Novel Modulation Technique”, IEEE Transaction on Circuits and System, 2020
6. Yang Yang , “ Design and Application of Intelligent Agriculture Service System With LoRa-based on Wireless Sensor Network” , International Conference on computer Engineering and Application , 2020
7. Thirumurugachandar and Sankari, “ Efficient Energy Harvesting And Reusing System”, International Research Journal of Engineering and Technology (IRJET), 2020
8. Jitendra Yadav and LavkeshPatidar, “ Energy Harvesting From Piezoelectric Materials”, International Research Journal of Engineering and Technology (IRJET), 2020
9. ChenxiJia and Xing Zhang, “Design of a dynamic key management plan for intelligent building energy management system based on wireless sensor network and Blockchain Technology”, School of Intelligent Manufacturing, Jiangsu Vocational Institute of Architectural Technology,, 2020
10. Adamumurtalazungeru and bakarydiarra , “A Secured Smart Home Switching System based on Wireless Communications and Self-Energy Harvesting ”, IEEE , September 2019
11. Dhanshree S. Kale, Dinkar L. Bhombe and Dhiraj P. Tulaskar, “Implementation of Soil Energy Harvesting System for Agriculture Parameters Monitoring and Controlling Using IOT: A Review ”, International Research Journal of Engineering and Technology (IRJET) , 2017



12. RishabBhamral and Sanjeev Mahajan , “Review on internet of things based on wireless harvesting unit ”, International Research Journal of Engineering and Technology (IRJET),2017