

Smart Home With Iot

¹Mr. Achinta Kumar Palit, ²Mr. Samyo Ranjan Jagdev, ³Miss. Shruti Samanwita Mishra

¹Assistant Professor In Department Of Computer Science And Engineering

²Miss. Subhashree Sibani Sahu

³Assistant Professor In Department Of Master Of Computer Application

Gandhi Institute Of Excellent Technocrats College, Bhubaneswar

achintapalit@gietbbsr.edu.in

ABSTRACT

In this paper smart home is implemented for maintaining environment condition of home. It is a process to implement the orientation of power consumption within and outside the Smart Home. The main importance is to implement Smart Home into botanical environment that is making circumstance for green house condition. This paper provides knowledge on how green house condition can be implemented for building Smart Home. Presently, IoT and machine-to-machine networks allow for the advanced design and development of smarter homes with cognitive intelligence. To build Smart Home maintaining balanced energy consumption within and outside is the major factor which is undertaken in this paper. Since the development will enable to move towards Smart Home from traditional Home. IOT provides the new dimension to build Smart Home. Smart Home provides convenient process for to provide comfort, security and energy efficient environment for the future. It can be deployed for future enhancement in building bio environmental Home. Variety of appliances are available for building Smart Home with the increasing demand of the people. The proposed system is flexible and easy to implement in the process of building Smart Home so as to meet the demand of the people.

Keywords:- Smart Home, Internet of Things (IOT), Energy Consumption, Sensors, Electronic Product Code Network (EPCN), Radio Frequency Identification (RFID), Dynamic Load Priority (DLP), Green Home System (GHS), Home Intelligence (HI)

INTRODUCTION

In smart homes, energy management is used to define the conditions both inside and outside the home. Energy management is the process of controlling power consumption inside and outside the smart home. In this case, power consumption is represented through the load unit consumption. Number of unit of load either increases or decreases will controlled by the Smart Home and implement in normal power unit. Usual power consumption will generate the unit of load within the Smart Home. Major factor is to implement Smart Home into botanical environment. Main circumstances is to implement green house condition by using temperature sensor, humidity sensor, weather sensor, air sensor, light sensor and noise sensor.

FEATURES OF SMART HOME

Some of the important features for Smart Home are mentioned below:-

Temperature sensor for Smart Home should be around 160c to 280c. If the temperature condition

is less than 160c than the appliances will turn OFF and also above 280c than it will turn OFF. It will only turn ON in the given set condition which is the normal condition.

Humidity sensor for Smart Home should be around 220c to 240c. If the humidity condition is less than 220c and more than 240c than the appliances will turn OFF. Otherwise it will be in normal state.

Weather sensor for the Smart Home should be controlled in related to environment set up condition. Any changes in environment condition in the circumstances, same will happen within the Smart Home.

Air sensor will control the environment gas like O₂, CO₂, NO₂ and O₃. Any fluctuation in the gas, there will be change in the air condition within the Smart Home. Measurement of air temperature will be balanced with temperature outside the Home environment.

Light sensor will be implemented by turn OFF/ON. Any up and down in the energy consumption will be adjusted by the fluctuation of energy measurement unit that is, metering unit. It will

control the voltage unit supply with related to electric fluctuation. Total voltage fluctuations will be between 80 volt to 140 volt, if it will be above then the bulb will fuse.

Noise sensor will be implemented by controlling noise pollution volume. Total volume will be 8 micro units. If it is less or more than 8 micro unit, then it will be inaudible.

This enable the circumstances of enacting voltage fluctuation and utility of voltage control for an inward circumstances of Smart Home. It will be handling by IOT, which will be helpful in establishing network communication in the Smart Home environment. Energy consumption unit management will be enhancing the usual process to provide important factor. Process of consumption will proceed within the limited controlling unit. Current circumstances will proceed in the process of environmental implementation. The goal is to develop a technique that enhances project work with smart homes and IoT. Recent developments in IoT and machine-to-machine networks enable the design and creation of smarter homes with cognitive intelligence. Improving conditions inside the home will help advance from Smart Home 1.0 to Smart Home 2.0, leading to the development of traditional homes into smart homes. A cloud system is used to store, manage, and visualize data, creating an engaging interaction between plants and home users. Smart Home 2.0 will offer more advanced and interactive healthcare applications for urban residents in the future.

The energy management of end consumption has strong relevance in the future power system mainly in smart grid and micro grid operation context. A dynamic load priority is implemented for changing priority load in response event time. Load priority of each load is represented as change in energy consumption in variation unit. Load priority is analysed to load in demand with the time period. Power is low or high is represented as turn OFF in power consumption, if turn ON the energy consumption will be according to priority.

CHARACTERISTICS

1. Measurement of home conditions.
2. Processing instrumental easy process for handling Smart Home Energy Management.

3. Monitoring home appliances for inter related methods and ways to handle the technology.
4. Using Micro controller enable sensor for measuring and auto handling remote technology.
5. Monitoring temperature condition within Smart Home Energy Managements.
6. Using sustainable natural condition within Smart Home Energy Managements.
7. Enhance energy saving technology within the Smart Home Energy Managements in both offline/online.
8. Implement working function by using Tag, Reader, Middleware, Electronic Product Code Network (EPCN) and Enterprise System.
9. Use of Radio Frequency Identification (RFID) in creating working principle for Smart Home Energy Management.
10. Generate green home services within Smart Home Energy Management.
11. Enhance Smart Grid, power switch, IP line, Green Home System (GHS), Application of IOT for Smart Home Energy Management.
12. Reintroduced with Dynamic Load Priority (DLP) for establishing Smart Home Energy Management.
13. Design for Smart Home 2.0 for establishing Smart Home Energy Management.
14. Can be deploying for future or future scope for enhancement to be made.
15. Attach with cloud system technique for developing Smart Home Energy Management.

METHODS AND TECHNIQUE

- 1) Using IOT based things like smart wifi, internet, Bluetooth, zigbee, etc technology for machine to machine, human to human and internet to internet are implemented regularly.
- 2) Using IOT of communication like exchange of information between the micro units having micro-power, micro unit, etc for technology implementation.
- 3) Using internet as a mean to exchange network like 5G/4G/3G/LTE/VOLT, etc for network interexchange of information.
- 4) Maintaining privacy of the network using naming identification for identifying the technological user in the gateway bridge.

- 5) Using router for intermission between the end to end information exchanges. High/Low frequency of exchange depends on the signal exchange.
- 6) Maintaining security and services of internet for identifying illegal user and even blocking them to damage the Smart House Configuration.
- 7) Creating cloud computing for internet exchange, in transferring exchange of information. Usually it is implemented to inter exchange of signal by generating client/server side. In this case client side will access the requirement of Smart Home and server side will provide or fulfil the requirement of client.
- 8) By using cloud computing, there is increase in storage building space. This can be implemented by comparing physical storage and virtual storage.

FUNCTIONALITY OF A SMART HOME

A smart home system consists of applications built on top of IoT infrastructure. Smart home applications should have following main functions :

A. ALERT

The smart home system can sense its environment and send alerts to the user on their registered device or account. These alerts provide information about environmental data, such as levels of different gases, temperature, humidity, and light intensity. Alerts can be sent regularly at pre-defined times and may be delivered via email, text message, tweets, or other social media platforms.

B. MONITOR

Another important function of a smart home is monitoring. A smart home uses various sensors and camera feeds to keep track of its surroundings. This monitoring is crucial as it records every activity, allowing the system to take actions or make decisions based on the data. For example, if the room temperature rises above a set threshold, the system can send an alert to the user to turn on the air conditioner.

C. CONTROL

This function of a smart home lets users control various activities, such as turning lights and

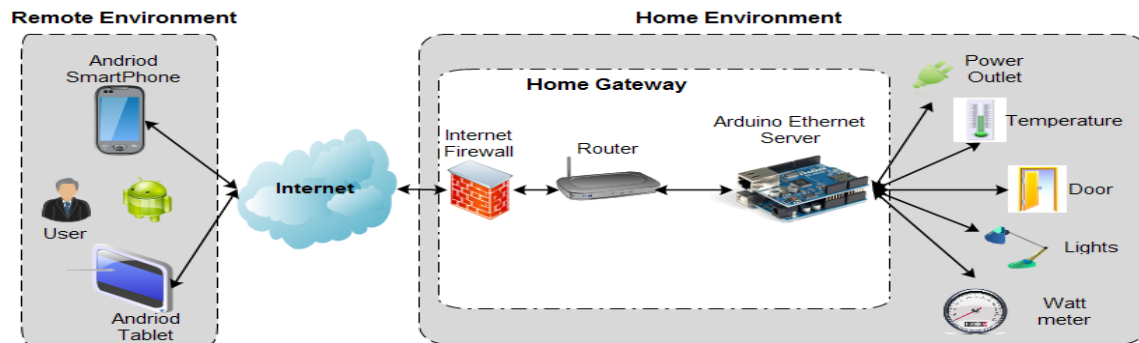
appliances on or off, locking or unlocking doors, and opening or closing windows. Users can manage these functions from their current location or remotely. Additionally, it allows for automation, like automatically turning the air conditioner on or off based on room temperature.

D. INTELLIGENCE

Intelligence, or Home Intelligence (HI), is a key function of a smart home and refers to the smart behavior of the home environment. This function involves automatically making decisions based on various events. HI relies on the Artificial Intelligence (AI) mechanisms integrated into the smart home system. Not only does HI provide the "brain" for the smart home, but it is also crucial for security, helping to protect the home more effectively.

WORKING PROCESS

Smart homes use technology to provide convenience, comfort, security, and energy efficiency for their occupants. With the rise of the Internet of Things (IoT), home automation has become increasingly popular. Wireless technologies like Bluetooth, Wi-Fi, RFID, and cellular networks enable remote data transfer, sensing, and control, embedding various levels of intelligence into homes. Research has explored several approaches for home automation. Some studies have focused on Bluetooth-based systems, where Android smartphones control devices via a Bluetooth sub-controller without internet connectivity. Other researchers have worked on network interoperability and remote access through home gateways. They proposed mobile IP-based architectures for smart home security and automation, though these have not been widely tested or deployed. Additionally, some studies have used web services, such as Simple Object Access Protocol (SOAP) and Representational State Transfer (REST), to remotely access home automation systems. SOAP-based web services are introduced as a smart home management scheme over Ethernet networks based on XML SOAP standards. However, SOAP can be complex and add overhead, leading to slower operation and higher bandwidth usage.



CONCLUSIONS

It seen that Smart Home and IOT are both dependent on each other. Their relationship is quiet relevant. Interaction between them will fulfil the development of new orientation in the field of computer science. It provides a new scope in the determination of new technology in the future. It result in making the future generation fully automatic and auto orientation in building a Smart Home. With IOT it provide a new dimension and meaning for the Smart Home. Use of internet technology and sensors has provided the new meaning in it. Development in hardware, software and middleware technology. This paper presents an analysis of the performance of the proposed smart home control system. The result provides development of Smart Home over traditional Home. It also generates a new idea for future scope. It provides to enhance in the future. Thus there is scope for future development.

References:

- [1] T. S. Gunawan, I. R. H. Yaldi, M. Kartiwi, N. Ismail, N. F. Za'bah, H. Mansor, and A. N. Nordin, "Prototype Design of Smart Home System using Internet of Things," *Indonesian Journal of Electrical Engineering and Computer Science*, vol. 7, pp. 107-115, 2017.
- [2] L. Ningqing, Y. Haiyang, and G. Chunmeng, "Design and implementation of a smart home control system," in *Instrumentation, Measurement, Computer, Communication and Control (IMCCC)*, 2013 Third International Conference on, pp. 1535-1538, 2013.
- [3] M. Wang, G. Zhang, C. Zhang, J. Zhang, and C. Li, "An IoT-based appliance control system for smart homes," in *Intelligent Control and Information Processing (ICICIP)*, 2013 Fourth International Conference on, pp. 744-747, 2013.
- [4] Y.-P. Tsou, J.-W. Hsieh, C.-T. Lin, and C.-Y. Chen, "Building a remote supervisory control network system for smart home applications," in *Systems, Man and Cybernetics*, 2006. SMC'06. IEEE International Conference on, pp. 1826-1830, 2006.
- [5] Oh, H., Bahn, H., & Chae, K. J. (2005). An energy-efficient sensorrouting scheme for home automation networks. *Consumer Electronics, IEEE Transactions on*, 5 1(3), 836-839.
- [6] De Meulenaer, G., Gosset, F., Standaert, O. X., & Pereira, O. (2008, October). On the energy cost of communication and cryptography in wireless sensor networks. In *Networking and Communications*, 2008. WIMOB'08. IEEE International Conference on Wireless and Mobile Computing, (pp. 580-585). IEEE.
- [7] Kortuem, G., Kawsar, F., Fitton., D., Sundramoorthy, V.: Smart objects as building blocks for the internet of things. *Internet Computing, IEEE*, vol. 14, no.1, 44--51 (2010)
- [8] Al-Qutayri, M.A., Jeedella, J.S.: Integrated Wireless Technologies for Smart Homes Applications. In *Smart Home Systems*, M. A. Al-Qutayri, Ed., ed: InTech (2010)
- [9] T. Chen et al., "Recent Developments in Network Intrusion Detection," *IEEE Network*, vol. 23, no. 1, Jan./Feb. 2009, pp. 4-5.
- [10] Boban Davidovic, Aleksandra Labus, "A Smart Home System Based On Sensor Technology", *Electronics and Energetics* Vol. 29, No 3, September 2016, pp. 451 - 460