NOVEL SECURITY OF HOME USING SMART HOME MANAGEMENT SYSTEM

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Abstract: The 21st Century in the era of Information Technology we are surrounded by much new technology IoT, big data, cloud computing, image processing etc. this all things bring smart and secure lifestyle. And the new trend is of the Smart Home and we proposed smart home system which is integrated with web technologies for better communication, system scalability and reliability.
In our proposed system we can add and manage more security to the system which will be useful to monitor the security of the home using various sensors on the web portal.

Keywords: IoT, Smart Home, Cloud Computing, Security, Sensor Network, Raspberry Pi, JSON

I. INTRODUCTION

An Internet of Things (IoT) is the Network Of physical objects or "Things" like Electronic appliances, sensors, vehicles etc. are connected to the cloud with the help of network connectivity Wi-Fi, telecom services which enables these objects to collect and exchange data over the internet. IoT allows any event of object or any activity to be monitored and controlled via remote connection across existing Network infrastructure which is creating opportunities for more direct integration between the physical world and computer-based system and resulting In Improved efficiency, accuracy, and economic benefit.

At the home end, a home user web portal or a website was created to control, for example, energy, scenario and security functions. [1]

Things in the IoT, can refer to the wide variety of sensors such as the heart rate monitoring and pulse rate detection, temperature and humidity, Passive infrared sensor, ultrasonic range detection sensor. Examples Home/daily-life devices, Business and, Public infrastructure, Health-care and Environmental sensors. It is a smart home management. We used following technologies to build proposed system.

Raspberry Pi

Raspberry Pi is a small computer [2] which allows us to connect various sensor devices through its GPIO Pins it has 40 GPIO Pins and Wireless Connectivity like Wi-Fi, Bluetooth.[3]
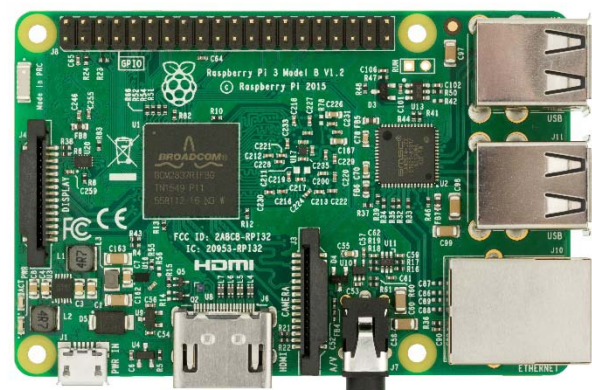
A. PIR Sensor

Passive infrared can be used for detection of the Motion. It can detect objects or motion within a 7-meter range[4] which can provide better security for a smart home.

B. *Ultrasonic Distance Sensor*

Ultrasonic range or distance sensor can be used for smart parking. Which can detect any car or object in the parking area if we fix ultrasonic sensor in the parking area.

C. *Temperature and Humidity Sensor*

Temperature & Humidity Sensor can be used to monitor the changes in the temperature and humidity in the home. Temperature values can be taken as an input for Electronic Appliances.

D. *Heart rate and Pulse rate sensor*

Heart Rate and Pulse rate sensor will detect the human heart beats when the user will touch and hold the sensor and we can analyze changes in the heart rate.

Related work

A literature survey showed that studies on smart home management system focuses on following areas:

Multiple users and different displays, web-based Services and Sensors, Security, Energy Saving.

A. Multiple users[1] and different displays[1]: Smart home management system can choose multiple users at home and they can interact with multiple screen sized devices like Tablet, laptop or Smartphone simultaneously. The Smart home management system can enable the communication between surrounding sensors like PIR Motion.

B. Web-Based Services: Web-based services mainly focuses on the high -level smart home management and monitoring and configured the data privacy. The smart home management system can be extended with multiple sensors like Infrared Sensor or RFID which is Radio Frequency Identification. RFID can be used to integrate it into Parking and it will become smart parking. Web-Based services and smart home management system has configured through web servers for easy interaction for users.

C. Sensors: Building Smart home management for a home called smart home and it consists lighting, energy saving, security, health monitoring as well as home appliances. WI-FI is most widely used for remote monitoring and control. Sensors are devices which are used to detect certain events in its Surrounding and send the information to the raspberry pi. Sensors are used in everyday objects.

D. Security: Security focuses on the goals which are Data Confidentiality, Integrity, Availability, Authenticity, Authorization, Non-Repudiation

Data Confidentiality is the ability to assure data is displayed to the only authorized user.

Integrity is accuracy is maintained no modifications are done or losses of data.

Availability is nothing but it will be always available to the authorized user.

Authenticity is validation which is used to validate the smart home user.

Authorization is assurance that the access rights defined for restriction of illegal activity.

Non-Repudiation assurance that verification of claim of the user.

Challenges or threats -Attacks are either passive attacks like eavesdropping or active attack denial of service. Attacks are harmful and they are targeted to gain vulnerable information

E. Energy Saving: Moving towards the smart home management system it will be required changes not only how energy is supplied but in the way it is used and reducing the amount of energy required to deliver services is essential. We can use Zigbee for smart home management System.
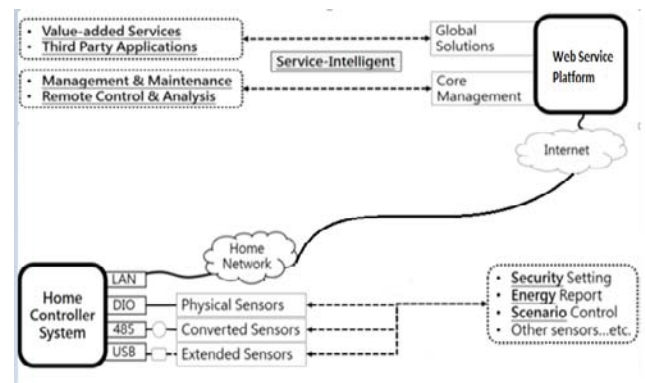
II. PROPOSED SYSTEM

Fig.1 Proposed System Architecture

The Figure mentioned above states construction of the smart home management system's hierarchical architecture which consists of Home control system and Web service platform. The home controller system contains Network Connection, digital input - output lines, MCP 3008 and USB Cables. Home Controller System integrates physical and conversion sensor (MCP3008) and expansion for Heart Rate Monitoring. Home Controller System can expand Security settings.

The Core management of web service platform focuses on management and provide Remote control and Analysis. The Web Service is nothing but it will

show all the Sensor output of PIR Sensor, Ultrasonic Distance Sensor, Temperature and Humidity Sensor, Heart rate and Pulse rate sensor on a single web page. A Web Service includes Login Log out Module and also, we can add more smart home users. Third party application PHP, MySQL databases are used for web services.

III. CONCLUSION

This study first proposed a smart home management System architecture which uses standard interface devices at the home end to logic and user interface with achieving multiple users and different displays.

IV. REFERENCES

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