Home automation Solution

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Introduction

In today's world, home automation is on the rise with the introduction of concepts and device implementations that help save energy, water and other resources in the house, as well as security measures all around the house.

However, to implement and integrate IoT automation in a house, especially an already existing house is very tough with all the wires that would have to be fit in and around the house based on the current implementation method that exists in the market.

The currently proposed solution is as follows:

- Implementing a completely wireless system in the entire home, thereby eliminating any need of intrusive construction on the property.
- Implementing multiple forms of wireless communication so as to make sure that some form of communication always is active for the data communication throughout the establishment.
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Methodology

Iot enabled Home automations have the main task of monitoring various environmental factors in various areas of the house and then accordingly perform actions, if instructions to perform said action has been given by the user. User can get reports on the various parameters within the house if they so wish and remotely control the actions within the house if the feature is enabled.

By placing sensors and modules in appropriate places everywhere within the house, these various factors can be monitored and sent to gateways via nodes to eventually be sent to the cloud to help decide the action to be performed based on the data analytics received.

Key Findings -1

- **Our Deep Insights.**

Some current methods of home automation involves a lot of invasive constructions inside the house to lay the wires that connect all the various devices to the central controller. This is very tiresome and also involves some negative factors. Some of which are as follows:

- Invasive construction (Drilling walls, removal of floor panels and tiles to lay wires etc)
- Integration of new devices into the system is not easily done by he user and requires that the company send a technician to help perform these tasks.
- Maintenance for the wires and devices every month may not be convenient to the customer.

In order to eliminate all these problems, a wireless automated environment is proposed to be implemented. These eliminate time lost in setting up the entire system and easier integration of newer into the automated system. Maaintenance is minimal as well and can easily be performed by the customers themselves.

Key Findings -2

- **Places that require most automation**

In and around the house, the place that requires most automation by far is the kitchen. There exists many potential hazardous situations that can be defused easily by the precense of these sensors and actions the automated system can take if allowed by the user. Examples include sensing the smoke levels in the kitchen and switching the exhaust fan on and if the level of smoke reaches a certain level, then initiate an alarm sequence to alert the occupants of the kitchen and , by extension, the occupants of the house.
There also exists multiple areas in the kitchen where automation can help ease the life of the user in the kitchen. Profiles can be setup that set the users personal preferences and settings in the kitchen as and when they use it.

Rooms like the bathroom would be another room that can benefit with automation. Sensors that sense the water heater levels and automatically switch them off when they reach a users preferred level of heat. Prerequiste to that would be that the system has a general idea of when each of the occupants of the house prefers to take a bath and switch n the water heater accordingly and subsequently, switch on and off the heater to maintain that temperature.

Other rooms consist mainly of sensors and automations related to security and precense detectors for switching lights and fans on and off.

Key Findings -3

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Our IoT Home Automation benefits

- ✓ Wireless home automation setup.
- ✓ No invasive constructions for setup
- ✓ Security measures on every door or window which a human can enter
- ✓ Easy integration of new pieces of technology with the system.
- ✓ Edge gateways to prevent personal data from being sent beyond the limits of the house.

Overall Summary

- Wireless communication enabled IoT home automation.
- IoT enabled wireless communication gateways to be installed in appropriate location of the home.
- AWS/Azure is chosen as the cloud platform to implement centralized data processing and analytics.
- MQTT is the chosen IoT protocol for communication of data gathered from the various sensors.
- The sensors shall also have alert message facility to enable monitoring of sensor tampering
- Graphic user interfaces, dashboards and mobile applications will be created to help the user/home owner monitor and view all information gathered by the system.

CONCLUSION

IoT enabled home automation with a wireless setup presents an efficient low cost IoT based solution using LPRF/4G/WiFi/LoRa for communication between various smart devices to facilitate proper functioning automated devices in any room and security measures throughout the house. LPRF is used as a backup form of communication between devices. Initial deployment results encourage using WiFi, 4G and future technologies to ensure smooth communication between the various devices.

The solution also provides how end users can access various data reports by simply accessing the mobile application which is integrated into the home automation system. With this application, the user is able to see all the data they want from electricity consumption, amount of time for which various appliances were switched on, individual camers access to every camers placed in the house etc. Other features have been implemented to educate the end user and provide incentives related to efficient usage of appliances. By implementing this IoT enabled home automation system, we aim to make home life more comfortable and easy, and will provide the user with data to help them make better home lifestyle choices while keeping their home safe from intruders with the help of the security system.

Thank You

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