SMART HOME CONTEXT-AWARE AUTOMATION BY CUSTOMIZATION STRATEGY

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Abstract-Internet of things (IOT) is a good technology that is used to associate and stay awake to the object that was connected to the Internet. In this technology, the home in a smarter way there are several sensors and act at home to learn about the environment and human behavior.
This system works by collecting user recommendations and some external sensory factors that can affect the use of the organization. This information is then analyzed to determine the correlation between the individual states of the device and the corresponding external influence factors. This document presents a rule-based service customization strategy that uses a rulecoincidence method based on semantic distance to make decisions about the context and a set theory method based on set theory to monitor service customization. The simulation study reveals the tendency of algorithms in the complexity of time with the number of rules and elements of the context. This document has developed reduced bandwidth, high latency or lack of reliability.The design hypothesis is to reduce the bandwidth of the network and the precondition of the capacity of the device in an attempt to guarantee accuracy and a certain degree of security of delivery. For reduced bandwidth and battery life. This document develops an unreal vision and a powerful and loyal organization through which one can achieve the ambition to save energy and the correct use of energy resources. It develops Raspberry Pi as an intelligent platform through which different devices can be connected and can be maintained from a greater distance because the connection that would be used would be through the network to manage and control physical objects with ease. Achieving the improvement of the quality of life by providing a profitable life, including security and entertainment through the use of the AES algorithm.

Keyword: Smart home, Internet of Things (IoT), context-aware automation, Bluetooth, Rule generation, Sensor, Raspberry Pi.

I. INTRODUCTION

Home automation is the process of supplying automatic and intelligent home automation using the sensor [1]. Internet of Things (IoT) works on intelligent objects that connect to the sensor and gather information and communicate with neighboring people using mobile, wireless and sensor technologies[2].We use the sensor to request an opinion of the environment. The meaning of embedded is the connection of two different things and the integrated system in which the software is integrated into the hardware. The integrated system that has the advantage of low power consumption improves system performance and does it easily. Taking these advantages into account, this integrated system can be used to develop the smart home [3]. The conscious personalization procedure of the proposed context sees the contextual context as the Decision Advice System (DIS), in whose context and services the conditions [4].It consists of a management coordination strategy based on semantic separation and an age-based technique based on approximate set theory (RST). The management coordination strategy consists in establishing the composition of the IT service informed with the configuration indicated by the principles in the rules file and the rule generation technique is used to determine new standards for better administration of the administration. customization. An algorithm model with cellular phone and a minimum effort of industrially accessible gadgets is described and executed to show the possibility of the proposed technique.

a. Background

The context-aware computing paradigm is not another consideration in the subject's development, while its integration with smart phones and new detection methods to improve user interaction and facilitate individual activities has been perceived as a region of different research [5]. The exams around you are essentially focused on five points: discrete perception of the environment, efficient and secure infrastructure, semantic representation and understanding, decision making and discovery of knowledge and domain-specific applications.

b. Motivation

The motivation for the development of smart home systems comes from many reasons, but the most important are comfort, security, energy management, connectivity and luxury. Smart Home systems are one of the newest research areas that have not been fully integrated into our society. The cost of installing a smart home is also a major obstacle to the emergence

of smart home systems in the market. The additional cost of the installation comes from the fact that, although most of the houses were built in the near past, the technology has grown exponentially. This means that most of the houses were built before this technology was available and this creates a barrier to the development and sale of smart home systems. However, technology is getting better and cheaper, and this will help to make smart home systems an expense worth having when building new homes. The biggest motivation behind smart home systems is the convenience. Convenience is really another way of saying Time saving", and in the world of the days when everything moves faster, every second has a value. Most of the technology we use today is based on convenience, for example, cars take us where we need to go faster, phones give us information from other people faster and computer work gets faster. The smallest comforts at home will be desirable because they allow the house to save even the user's time. Another reason for selecting this product is connectivity. The idea of connectivity is that connecting things is translated into communication or information transfer. By connecting everything in the house, so that everything can be communicated, information about the house is easily obtainable. There are many advantages in increasing the amount of information available. Research and analysis are one of the main advantages because data extraction is much simpler when things are connected in a single network. For example, connectivity will lead to data extraction possibilities, such as the amount of energy used by some devices or 4 components. Connectivity also increases control over resources. Having the data to make informed decisions, increase home control [8].

c. Scope

A large portion of the work in the task will comprise in the coding of the GUI interface and the focal programming of the system. Specifically, additionally look into on USB/Bluetooth interfaces is required, as this will be vital to the achievement of the task [7]. Nonetheless, this hindrance ought not be outlandish and the task is relied upon to be finished before the due date. This will enable you to include more highlights, for example, remote correspondence, to build the general usefulness of Smart Home.

d. Goal

The purpose of the Smart Home task is to incorporate lighting, temperature, means and security frameworks into a focal interface. This will enable the client to control light and temperature levels all through the home while transmitting sound to various zones and observing the security arrangement of your home. This component will be controlled by a graphical UI situated on the client's PC. The item will incorporate all the equipment and programming vital for simple establishment and use without the client's assistance.

e. Objectives

1. Develops a lightweight messaging protocol (MQTT), designed for restricted devices and networks with low bandwidth, high latency or unreliable latency. The design principles are to minimize network bandwidth and device resource requirements while trying to ensure reliability and a certain degree of security of delivery.
2. For reduced bandwidth and battery life.
3. Develop artificial intelligence and a powerful and reliable system through which to achieve the goal of energy conservation and efficient use of energy resources.
4. It develops Raspberry Pi as an intelligent platform through which different devices can be connected to each other and can be controlled from a longer distance because the connection to be used will be via the Internet. Easily manage and control physical objects.
5. Achieving the improvement of the quality of life by providing a profitable life, including security and entertainment through the use of the AES algorithm.

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II. LITERATURE SURVEY

Ref No	System Advantages and Disadvantages	This Proposed Refers to:
[1]	**Advantages:** 1. Reduce energy consumption. 2. Status graph module to collect sensor data. **Disadvantages:** 1. These are high costs of ownership, rigidity, poor administrative capacity and difficulty in achieving security.	We transform a normal home into a smart home while we reduce energy.

[2]	**Advantages:** 1. This low-cost system with minimum requirements covers both home security and home automation. 2. To operate the home security system, the user does not need to have the data connection on their enabled phone. The system works well with the launch pad connected to the wifi at home. **Disadvantages:** 1.Alerts was sent from the system managed by the connected Wi-Fi microcontroller	The owner identifies that the person entering the house is not an intruder but an unexpected guest of his then instead of triggering the security alarm, the user / owner can make such arrangements how to open the door
[3]	**Advantages:** 1. Improve the quality of life by providing a profitable life, including security and entertainment. **Disadvantages:** 1. The lack of standards for integrating various sensors, applications and other existing intelligent embedded devices.	Home automation with Bluetooth is presented in an internal environment and home automation via Ethernet in an external environment.
[4]	**Advantages:** 1. Reduced installation costs. With wireless networks, associating mobile devices such as PDAs and Smart-phones with the automation system becomes possible everywhere and at any time, as a device's exact physical location is no longer crucial for a connection **Disadvantages:** 1. This is not a problem as long as the system is not planned well in advance and installed during the physical construction of the building. 2. The cost of implementation is very high.	The home automation system differs from other systems by allowing the user to use the system from anywhere in the world via the Internet connection.
[5]	**Advantages:** 1. Real-time data reporting and task execution (RTRE) for automated WSAN. 2.Data collection is obtained through the coordination between sensors and mobile actuators. **disadvantages:** 1 The theme of the real-time structure is very important for the WSAN.	WSAN allows application systems of feel, interact and change the physical world
[6]	**Advantages:** 1. Activities of patients in their living environment. 2. An electronic patch worn by the subject to identify him and detect falls. **Disadvantages:** 1. Economic and societal problems over the last decades.	A web application enables the medicinal staff to get to developments and alerts.
[7]	**Advantages:** 1. Improved approach for providing remote access security for the home environment. **Disadvantages:** 1. Significant security challenges arise from making the home environment accessible to anyone with access to the Internet. 2.These security challenges and their weaknesses are reviewed.	In terms of constantly evolving management IP addresses of home automation systems, but different from Dynamic DNS in terms of key management
[8]	**Advantages:**	It describes collective information about sensors,

	1. Special algorithms of different fields and their meaning are explained according to their scope of use in smart homes. **Disadvantages**: 1.Conditions of the domestic environment	multimedia devices, communication protocols, and systems, which are widely used in smart home implementation.
[9]	**Advantages:** 1. It is very suitable for smart home load forecasting. 2. To produce the best solution for load demand management and decides when and which electric appliances should be turned on or turned off. **Disadvantages:** 1. It is often difficult to construct an adequate forecasting model for this type of load.	The proposed strategy was confirmed utilizing the family units stack information.
[10]	**Advantages:** 1. Enhancing quality and productivity. 2.The model driven development approach stands out as a good option **Disadvantages:** 1.High cost for sensor.	The present article proposes an alternative methodology and tools for the development of home automation applications following the model driven approach together with the use of a domain specific language.
[11]	**Advantages:** 1.Improving service discovery and security as well as being optimized for deploying on resource constrained devices. **Disadvantages:** 2.The interoperability of heterogeneous devices and flexibility of devices' usage are two key problems that challenge the implementation of smart home.	By giving a visual interface to portraying an administration work process (SW), the client can without much of a stretch alter the activities of gadgets by administrations piece.
[12]	**Advantages:** Improve the baseline predication. **Disadvantages:** 1.Lots of researches have been done for context-aware recommendation	Measuring and incorporating significant contextual information in recommendation.
[13]	**Advantages:** 1.A set of infrared sensors that detect the person's presence in a portion of a given home part, **Disadvantages:** 1. To ensure that elderly people can live safely and independently in their own homes for as long as possible.	The trial comes about demonstrate that our approach outperforms the others and supplies clients a more proactive way that could convey the best possible information to the correct clients in the best proper context.
[14]	**Advantages:** 1.Provide improved protection for resource limited WSN-based HASs from low-level DoS attacks **Disadvantages:** 1.Existing approaches for DoS defense are generic and are not capable of filtering out all attack traffic, so a small amount of attack traffic reaches an HAS.	The virtual home, remote home server and DoS defence server. The proposed strategy can filter low-level attack traffic
[15]	**Advantages:** 1. Home automation and security environment with the total solution. **Disadvantages:** 1. Inconvenience in controlling each digital home appliance which requires its own remote controller.	An advanced universal remote controller (URC) with the total solution for home automation and security.

Table.1 Comparative Study of Existing and Proposed System

III. FEATURES OF RASPBERRY PI IN COMPARISON TO OTHER LATEST TECHNOLOGY

FEATURES	RASPBERRY PI	ARDUINO
IDE	SCRATCH	ARDUINO-IDE
Memory RAM	256 MB to 1 GB RAM	0.002MB 2KBYTE
Clock Speed	700 MHz to 1.2 GHz	16Mhz
On Board Network	10/100 Wired Ethernet RJ45, Wi-Fi, Bluetooth	None
System On Chip	BCM2835	SAM3X8E
Input Voltage	5V	7-10V

Table 2 Comparison of Raspberry Pi and Arduino

The Raspberry Pi appeared in February 2012. The gathering behind the improvement of the PC: the Raspberry Pi Foundation. It is trusted that Raspberry Pi is a perfect learning instrument, since it is modest to make, simple to supplant and requires just a console and a TV to work. These same qualities additionally make it a perfect item to improve IT in creating nations. [7]. Concerning the details, the Raspberry Pi is a PC that works with the Broadcom BCM2835 framework on a chip (SoC). This SoC incorporates a 32-bit ARM1176JZFS processor timed at 700 MHz and a Videocore IV GPU. It likewise has 256 MB of RAM in a POP bundle over theSoC. The Raspberry Pi is fueled by a 5V AC miniaturized scale USB charger or if nothing else 4 AA batteries. [8] The greatest distinction between something like Arduino and Raspberry Pi is in the proposed utilize. The Arduino is intended to be utilized as an advancement board with microcontrollers that will be customized and afterward incorporated into bigger machines or electronic gadgets and will have the capacity to work independently. Then again, the Raspberry Pi is expected to be utilized as a last item and works like a conventional desktop PC. [8]

IV. PROPOSED SYSTEM ARCHITECTURE

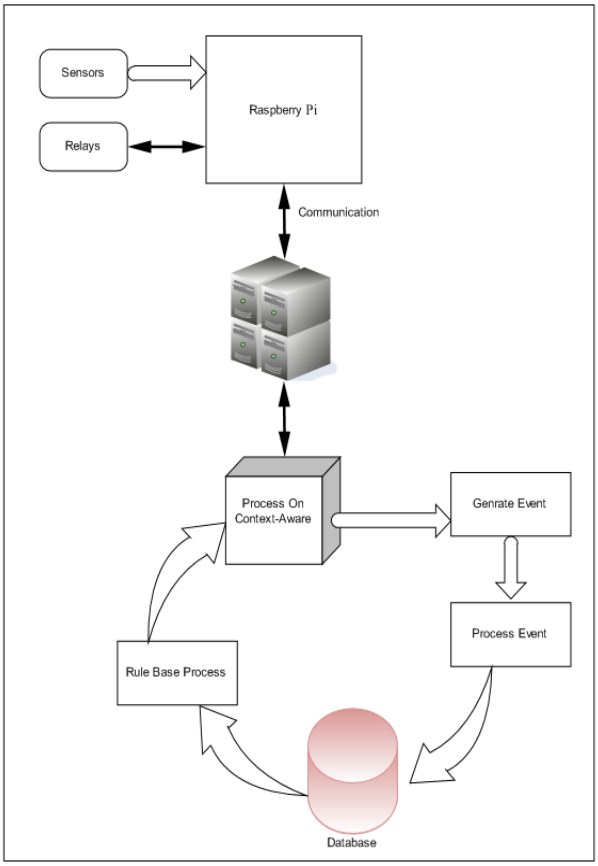

Fig. 1.Proposed System Architecture

Explanation-

Phase 1- In this phase, the main objective is to control the power switch of basic appliances using an android application. In which the Raspberry Pi will play as the main interface provider between the hardware and the application. In this stage to create lightweight

informing convention, intended for compelled gadgets and low-transfer speed, high-inactivity or inconsistent systems. The outline standards are to limit organize data transfer capacity and gadget asset necessities while likewise endeavoring to guarantee dependability and some level of confirmation of conveyance.

Phase2-
At this stage, the system will present the sensors that will verify and maintain a recording of atmospheric change and automatically regulate the entire internal system using the MQTT protocol. In this phase to obtain a reduced bandwidth and battery. Develop artificial intelligence and a powerful and reliable system through which to achieve the goal of energy conservation and efficient use of energy resources. To develop Raspberry Pi as an intelligent platform that uses different devices, you can connect to each other and can be controlled from a greater distance because the connection that will be used will be via the Internet.

Phase 3- This phase is the most important phase of this project in which it is necessary to enter an energy saving mode with a single click on the application. The main objective of this mode is to save the energy consumption of the entire system, which includes the adjustment of the devices in order to use less energy depending on the climate change and disable the unwanted functions of the Raspberry Pi so that the system can be more efficient in energy use and profitable. Manage and control physical objects with ease. Achieving the improvement of the quality of life by providing a profitable life, including security and entertainment through the use of the AES algorithm.

V. CONCLUSION

From the consideration of all the previous points, we conclude that the Internet of Things (IOT) is a good technology used to connect, control and maintain smart objects connected to the Internet. Build up a lightweight informing convention intended for gadgets with low transfer speed, high inactivity, or questionable systems. The plan standards are to limit organize transfer speed and gadget asset prerequisites while attempting to guarantee unwavering quality and a specific level of security of conveyance. For reduced bandwidth and battery life. Develop artificial intelligence and a powerful and reliable system through which to achieve the goal of energy conservation and efficient use of energy resources. It develops Raspberry Pi as an intelligent platform through which different devices can be connected to each other and can be controlled from a longer distance because the connection that will be used will be via the Internet. Easily manage and control physical objects. Achieving the improvement of the quality of life by providing a profitable life, including security and entertainment through the use of the AES algorithm. The proposed demonstration of contextual adaptation methodology and management customization that exploits different detection procedures to provide a proactive control advantage at home is possible and feasible. The context-sensitive control system complicates the unpredictability of the structure and decreases the calculation stack by isolating the control means: the control coordinates the basic leadership and the rule of administration. We look for all the information in the home environment and look for information through the sensor using some rules.

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