

Advance Dynamic Network System of Internet of Things



M. Robinson Joel, V. Ebenezer, N. Karthik, K. Rajkumar

Abstract: Constructing automation is a crucial part of IOT based smart spaces for attaining user comfortableness, energy efficiency and cost reduction. Current technologies for constructing automation are based on syntactic mapping among various sub systems of smart spaces. However, building automation process needs to consider the current status of subsystem semantically for achieving user comfortableness. Ontology is developed for semantic interaction between various subsystems. An application scenario is illustrated.

Keywords: Internet of Things, Ontology, Semantics, Smart spaces.

I. INTRODUCTION

IOT is able to connect substances like clever TVs, smartphones, devices, and actuators to the internet. Where these strategies are connected with each other, which is useful to communicate and convey information between people and themselves. These Internet of Internet rule over the years by creating a unique aspect to the sphere of data and message technologies.

To form a complete dynamic network of IOT there needs the anyone anytime anywhere terminology. Smart homes concept is developed with the help of IOT technology which in term can be used for creating new concepts which offer cleverness, ease and better-quality of life.

Voice Processing Integrated with IOT which is an exact talented sector, which has several reimbursements such as greater safety, security, if augmented ease. Similarly, it is used to save resource more significantly and energy saver. By giving instructions or commands through voice in an Android App is converted into a text format which will be get displayed in the Android App only, so the user gets the confirmation or a proper acknowledgment whether he had given the correct instruction or not. Then the converted voice data gets recognized by the AI techniques.

The AI techniques recognize the command and sent it to the

private cloud server. The mist server invokes the Raspberry Pi by the voice commands given. The usage of the PC can be avoiding by connecting the Raspberry Pi as the microcomputer trap server. The Raspberry Pi controls all the mechanical or hardware devices with a relay controller. They incorporate the voice activation which switches applications also useful to aged people and differently abled peoples.

II. MATERIALS AND METHODS

In this study, we broadly classify the study into major two sections namely speech recognition and household mechanization using the Internet of Thing. The voice processing helps to control the home appliances by easily giving commands from anywhere at any time through the cloud computing [15-19]. Integration of IOT allows an addition access to control this automation through the internet.

Raspberry Pi is collaborating with a PHP files and web server. To help the aged ones and differently abled citizens, this process helps them by monitoring and controlling the system. While designing the household mechanization system, we must consider these factors. This system is always cheaper and measurable in all aspects thus fresh devices combined into the developed system very easily, and it is accessible.

Amrutha S et. al. [14] presents a paper with well-designed and prototype implementation for a household mechanization with a help of message via text technology and voice recognition. They design a fault identification system which support the consumer to find out the electrical and electronics appliances had gone ON and OFF When their shelter's electricity load is not available with the visible range. Every house system supports two major event ON and OFF commands which are used as home load commands.

Rohit kankal et al. [2] have introduced a novel method for Speech Recognition Household mechanization in Wireless Internet [20]. The system presents by Rohit explained about the module which acts as an interface between present electrical or electro-mechanical system in a Household mechanization system.

Souveer Gunpath et al. [3] have Designed and Enactment of a Low-Cost Arduino-Based Smart Home System [2]. For the lighting of a lamp, heating of water, feeling cool with air conditioner and security for the human with automation, this system control and automate. Now days many new products use Wi-Fi technology for the remote monitoring which is easy to compose.

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This technological progress makes human society to another level of standard living with a concept called smart home. Implementation of automation systems to a common man is not easy since the system cost more financially.

But today world research in cheaper microcontrollers for example the Arduino, which can be used to develop and incorporate the majority of features present commercial systems.

The paper explained about highly scalable and cost-effective household mechanization with the help of Arduino systems embedded with microcontrollers which have the capability of connecting home appliance and industrial machines. Manoj Kumar et al. [4] have proposed an efficient method of Household Mechanization Using ZigBee [3]. ZigBee correspondence show offers a most outrageous baud pace of 250 Kbps, yet 115.2 Kbps was used for the microcontroller for sending and tolerating data. This Automation structure was taken a stab at using voice bearings of 35 male and female with different English elocutions. Each individual recorded 35 voice tests so full scale 1225 voice bearings were attempted and the structure precisely apparent 79.8% of them. Speaker articulation, speed, and including clatter impacted the exactness of the system. The precision of this structure is obliged in the extent of 40 m while the affirmation system is exact, up to 80m when given an unquestionable distinguishable pathway transmission.

S. A. K. Jilani et al. [5] have completed Household Mechanization Through Email Using Raspberry Pi [4]. Here they develop a savvy nuclear family mechanization structure subject to the device Raspberry Pi which examines the message body if the email which is sent. While tolerating the message body of the email is scrutinized by the framed figuring continued into Raspberry Pi and it will resend the attestation to the mail ID. This computation is made in python language, which is default programming language given by raspberry pi. With an IOT application, they can store the results on the web by making a fresh channel of API.

Mamata Khatu et al. [6] have proposed automated home with the support of IOT technology [5]. The author proposed a concept in this research that, with a goal of achieving maximized automation, they put forward a stated an actual enactment for the Internet of Things. These type of system are very much applied and used to monitor the condition with minimum sensing mechanism. They design to reduce the minimum human intervention by creating a relay between machines and stimulus each other. Clever sensors and transmission of data via the internet are being presented by interconnecting mechanism and the integrated network architecture reliable measurement of parameters. The monitoring system framework is developed with pervasive distributed sensing units which is used to sense. These systems used to aggregate the data for most important reasoning.

Potts et al. [8] proposed a smart home with help of Bluetooth Using application developed in android flat form which helps the smart seekers. They developed a household mechanization which provides convenience, security, and safety using the latest technology. Phones which normal human using are becoming Smartphones that moderateness grows every year. Mobile phone has begun to accept critical

occupations in our step by step lives in light of their size and smallness. Nowadays Android phones[7] are used to control home machines which enable the customer to control their home contraptions wherever and at whatever point while at home and extras time spent in checking for the remote-control unit of nuclear family computerization structures since the customer's phone is typically kept close inside reach. This proposed paper demonstrates the execution of a straightforwardness model and the arrangement and of a Bluetooth-based nuclear family mechanization system using an android phone. The arrangement uses an Arduino Mega 2560-r3 board and the home machines are physically connected with input/output ports of this board by methods for exchanges.

Bulbul Bhaskar et al. [12] have arranged Household mechanization without any difficulty AVR-based Board. In this assessment, the arrangement and model use of a Smart Household Mechanization System is proposed. These homes are powerfully moving from conventional changes to a bound together control system. The essential focuses of the Smart Household Mechanization System are to offer a straightforwardness response for farthest point the imperativeness usage, offer assistance and comfort, and make life less difficult.

Javale et al. [1] have proposed a sharp GSM based nuclear family mechanization structure. Their work inquires about the capacity of full home control, which is the objective of family mechanization structures within the near future. The proposed short message organization (SMS) text which the home machines, for instance, tube light, unforeseen system, and security structure can be electronic using nuclear family mechanization development using overall system for the convenient correspondence (GSM) modem by analyzing and execution. This proposed work is prevalently based on the handiness of the GSM show, where they use repeat move speeds which empower the customer to control the target structure away from the private. In the splendid GSM based family mechanization system, they seek after the consecutive correspondence thought and AT headings which helps the producers. Finally, the customers can have prepared to prepared to get analysis status of any home machines leveled out whether diverted on or off remotely from their phones PIC 16F887 microcontroller with the consolidation of GSM outfits the smart mechanized home structure with the perfect baud pace of 9600 bps. Abhishek et. al.[21] implemented home automation system using IoT. It is processed according to the user's needs. Here , sensors are used to store the data which has been forwarded to the cloud. If room temperature gets high i.e hot , fan or air conditioner is switched on. Suni Cheruvu et. al [22] implemented the smart home IoT System. It was mainly focused on Wi-Fi, Bluetooth[9-13], ZigBee and RF Mesh. It can act as a controller for lighting, calculation, security and surveillance etc. It provided plenty of services which is fully based on cloud. Adeniyi Onasanya et. al[23] implemented IoT enabled medical application. It was used for monitoring patient's health , diagnosis and detection of cancer, treatment given for disease.

The data had stored in the cloud. Jie et.al [24] implemented wearable IoT system and novel health monitoring system. Both were used to monitor the health and behaviour of patient. It enables patient or user to access all the information from the cloud. Patient could know their heartbeat, blood pressure and body temperature etc. Timothy et. al [25] implemented Monitoring and alert IoT system . It was used for calculating air quality, sound pollution and data transmission.

This system is mainly used for avoiding health risk and any potential risk. It was also solved the various security issues. Leo et.al [26] implemented IoT enabled monitoring system. This was used for monitoring the carbon dioxide in the air through NDIR technology. All the relevant data was graphically reported and stored in the cloud. Whenever we wanted to know the air quality, we could get through cloud storage.

III. PROPOSED SYSTEM

The proposed ontology aims at data sharing among healthcare, environmental monitoring and smart home applications for automating house hold appliances. The hybrid ontology matching is implemented to establish the set of correspondences among various ontologies of smart spaces. For example, in order to switch AC, the value of outside environmental temperature, body temperature of occupant, room temperature is considered. Semantic rule is described with semantic web rule language.

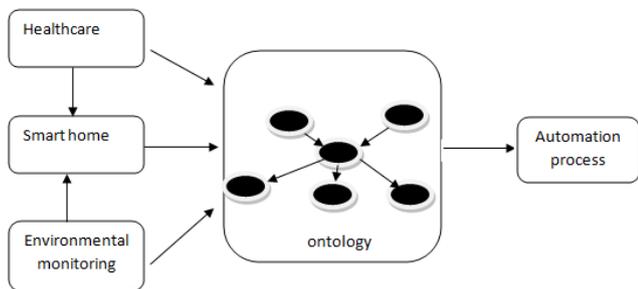


Fig. 1. Use of ontology for building automation.

IV. CONCLUSION

In this paper, Semantic mapping of IoT based smart spaces is proposed which establishes semantic correspondence among various ontologies. The temperature data is shared among smart spaces to automate AC. The scenario of controlling of AC is modeled with RDF and OWL. In future, we would like to consider various ontology alignments in building automation.

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