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Implementation of IoT Enabled Home Automation System Using Smart Application

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ABSTRACT: In the present era, everyone follows a busy schedule. In parallel, people need to manage routine needs and tasks to fulfill their needs without any complications. Human life is so precious and every second is countable in one's life and people don't want to waste such life in considering and doing some simple tasks. There comes the application of this project with IoT and can reduce the reaction and response time of the devices when it is easily managed by mobile applications and web applications. The objective of this project is to implement IoT[1] based wireless system. It consists of an ESP32 module that can transmit the user-defined commands to and from the cloud, these systems can also be used as an offline communication system with the help of Wi-Fi and Bluetooth. Appliances such as lights, fans, motor pumps, etc. Thing Speak is a cloud platform that is used for posting and getting information from the sensors that can sense different environmental conditions [2] and send the scalar values to the cloud their people can monitor their sensor values in a graph with the collected values from the sensors. According to the sensor threshold values, a developer can write the conditions that how the system should behave under those conditions. The major significance of this project is that a user can access their devices at any time in any locations where there is an availability of the Internet.

I. INTRODUCTION

At this point, the devices we use are getting brighter and smaller. They connect relatively seamlessly and can prove it in most of our usual everyday warehouses. The reality is that in this phase, known as the network of things, it's all about adapting and gathering the vast amount of certainty that can be captured from this growing network of hardware and sensors. where strategy is all aspects characteristic of the tomb. It's modern, but nonetheless, in its secure construction, and in essence, it makes sense to have it with these, as our sharp product-related sensors show. It can monitor the structure of our house and also the self-observation function of our car.

Anyway, we're in 2019. Imagine in the near future that all open entries would be present together to create new devices for managers, etc. By 2020, we will reach up to $ 1.9 trillion globally due to how our local smart hubs were able to envision favorable subsidy terms. We stand for the unmistakable power of the day.

This also leaves room for the calendar to review all notifications from the kitchen, and most of your checks come from the backlog of repair reviews you receive, perhaps repeating each of your recommendations back to you. There is another message from the teacher for additional weight loss plans. You send that fact to the main purpose of your home. This often shows a pattern that distinguishes each of your outcomes from potential people in the population when all is said, distorts your age, and requires you to switch to a similar decision. A more convenient app for all your basic online ordering needs. The electronic display in the aisle of the refrigerator prefers fresh foods made with pureed yogurt for breakfast and lunch. Case: You choose to travel in your car (Grabbing a key plug now allows you to get through your sharp center. Your morning walkie-talkie comes out more extreme. And cheaper, your home health structure fits and the GPS device included is perfect for work.

All the modest stuff in the morning actually starts with the individual and then moves on to that individual. However, this type of situation is not a particularly separable number. The amazing advances in sensors, devices (M2M), or machine networks have created a particularly encouraging and more limited underlying network, forming an extraordinary open entrance for large companies. These things, which can be scattered around the web, are clear examples of how people can complete their programs to generate certainty or run the shows they want to run on the web. This methodology shows links between routers and confirms that they can interact in the state and surrounding

areas. The choice can be made as a joint venture with pre-defined controls, and subsequent assignments will emerge without human intervention. These new exchanges have definitely hacked all the big open entries to remove the changes to the timeframe.
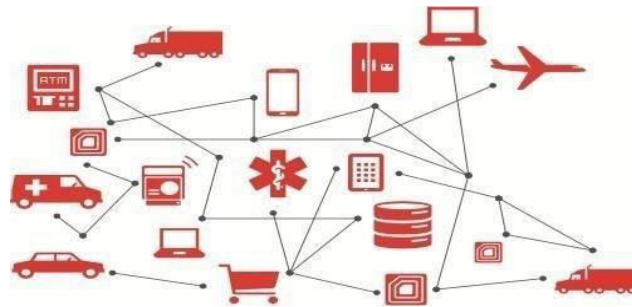

Figure.1 Internet of Things

II. LITERATURE SURVEY

Home robotization was first brought into the world market amid the 1970s, anyway it fails to meet the wants for people and was fruitless. There were various reasons related with the mistake of the home robotization system. The system was neither straightforward nor cost capable. At present, the main point to be recalled when arranging a home computerization system is that it should be cost-capable and easy to present.

1.The Framework of Home Remote Automation System   Based on Smartphone Akbar Satria and Widodo Budiharto
The fundamental thought behind this paper become to make a versatile application   on   a   phone framework so the buyer can be in expense of computerized approach; see the amount of float that has been used in the amount of dollars, so the issue is the multifaceted nature in sparing power which might be resolved.   advancement   and   format transformed into brought out through gathering measurements the utilization of poll to the respondents. format strategy utilizing explanations to convey polls and to dissect writing, and after that thereafter doing the structuring in equipment (that is the   microcontroller) made   United   rendition Language (UML), database planning, code usage and presentation of UIs on an IOS and on the Android. The consequence of this view is the usage of a remote household robotization cause in cell that could help the clients in rate to controlling the home and making sense of the charges of solidarity that has been used in each advanced device all together that the enhancement is done.

3.Wise Smart Home Automation and Security System Using Arduino and Wifi.
This paper gives an insignificant exertion fruitful and versatile home control and checking structure with the guide of an organized littler scale web server with web show (IP) accessibility for access and to control of equipment and contraptions remotely using Androidbased.

4.IoT Based Home Automation Using Raspberry PI.
This paper proposes the arrangement of Inter of Things (IoT) based home automation structure using Raspberry pi. Starting at now in day today's life we can scarcely find a house without a home automation structure. This endeavor is wanted to build up a home motorization structure.

5.Raspberry Pi Home Automation Using Android Application.
The endeavor introduces a negligible exertion and versatile home control and watching structure using a Raspberry PI module and a Static Relay, with web accessibility for getting to and controlling devices and mechanical assemblies remotely using Smartphone android application.

6. Shrewd home computerization: Gsm Sharp home automation has pulled in light of a real worry for the investigation arrange in the midst of the latest decade, at a mind-boggling way. Home security structures involve a continually making investigation field. In this paper, a security system for smart home robotization is proposed.

III. METHODOLGY

Home mechanization depicts a course of action of sorted out, controllable devices that participate to make your home increasingly pleasant, revamp, capable, and secure. You "talk" with your automated home through a remote control or astute contraption. In the accompanying area we will examine the advancement of our home robotization framework.
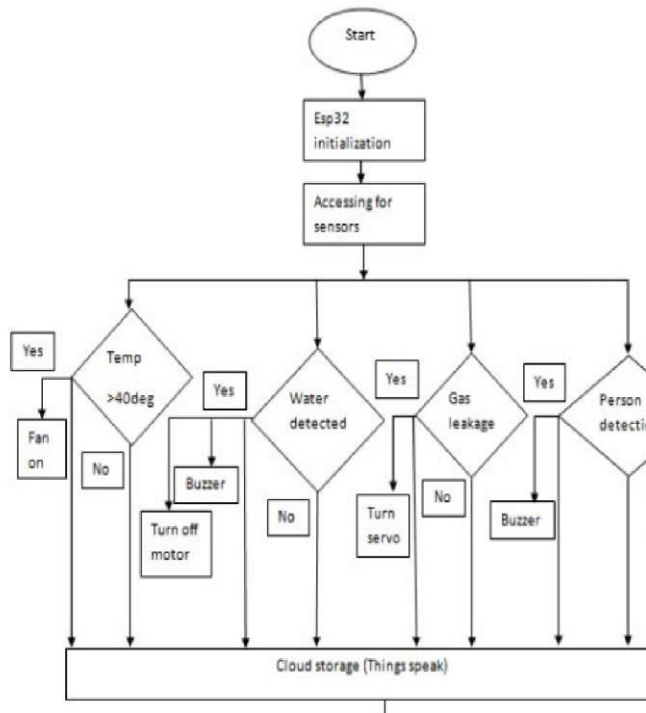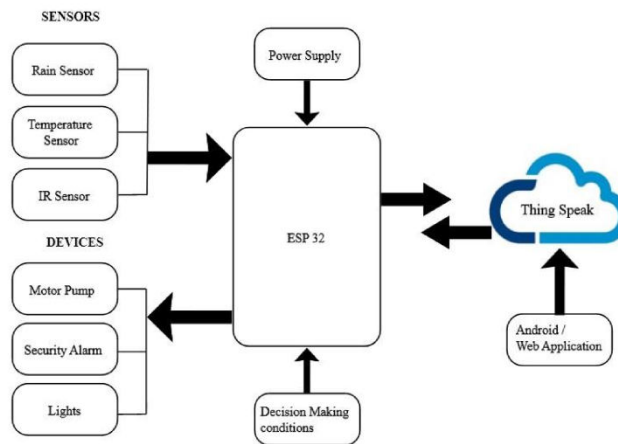
3.1 BLOCK DIAGRAM:

Figure.6 Proposed system Flowchart

The flowchart as shown in Fig.6 describes the software implementation of the proposed system. This system monitors the temperature value, water level in the tank, gas leakage and person detection values. If the temperature value exceeds then the threshold value fan on else fan off the value store in the cloud. If the water level reaches the

threshold value turn off motor or buzzer on the values stores in the cloud. If when the gas leaks in the home turn servo the values store to the cloud.

If the person is detected buzzer on goes to cloud else the value store in cloud.

3.3 WORKING PRINCIPLE

The working of this project starts with configuring the Arduino IDE to make it available for the ESP32 to accept the Arduino IDE configuration. Before starting to configure the Arduino IDE, the serial communication between the PC / Laptop with the ESP32 MCU. Download and Install the necessary libraries required to work with ESP32. After arranging all the requirements, the ESP32 is now ready to work with the code dumped in it.

After uploading the code to the ESP32, there are two blocks of code written to the ESP32, one is the setup and the other is the loop where the setup will execute only once while running the program until the ESP32 goes to reset state either via hardware or software and the loop will continue to execute throughout the whole process and there the conditional, logical and mathematical conversions can be done as per the user requirements.

The different sensors connected to the ESP32 GPIO ports can sense the different environmental conditions such as Temperature, Humidity, Distance, Light Intensity etc. These sensed values from the sensors are then published to cloud, there the values are organized for collecting the records and to decide what needs to be done under the given conditions. For example, if there is a condition when the temperature crosses a threshold value of 30 degrees, the speed of the fan can be increased to compensate the temperature.

Some other applications of this system are to control most of the home appliances such as Lights, Motors and Switches can be controlled from the internet. This project comes with an android application and a web application there the user can only have access to the controls of the system. This system is secure and alert you of the sensing parameters where a user can monitor the appliances and devices connected under the MCU network.

3.5 SOFTWARE DESCRIPTION
3.5.1 Android Application

In an IoT scenario, mobile devices act as an interface that will help in interacting with IoT connected devices. Smartphones comes with new age apps and sensors that will help in generating a lot of information about the user
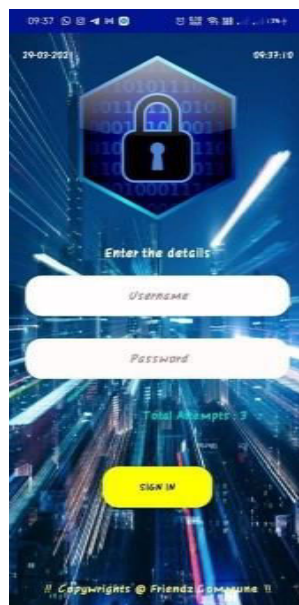

| Figure.20 a) | Figure.20 b) | Figure.20c) |

IV. RESULT

The proposed system of using Voice commands to control household appliances was successfully developed. The application is connected to the same IP as the ESP32 so that it can be controlled using any device that is connected to a network. No unwanted traffic can enter as the application is protected with the password on your phone and your Wi-

Fi. The developed system helps us in achieving our goal of home automation since it was successful in controlling the appliances using either the application on your smart device or through voice commands. The appliances were also be able to be controlled automatically trough the different type of input provided by the sensors

In figure. 24 connections of the system are made and the whole setup is embedded into a small box to be resistant of all conditions. The sensors record the values of home monitoring and device control of various types they are temperature, gas, PIR and water levels. The recorded values are should monitor on the cloud storage thing speak

The ESP 32 continuously updates values to the cloud and then retrieved to MIT app inventor. Fig.25 shows the Things speak channels updated values of gas, temperature, water level and PIR values[1]. If the recorded value exceeds the predefined threshold level, then the operator dashboard is notified with an alert signal by using the buzzer. Fig.25 Shows the all-sensor values like temperature value is 13, PIR value is 1, water level flows in the tank it shows the 4 and gas leakage value it displays the 459 value different types of sensor status of the different values and it will show the actuators status.
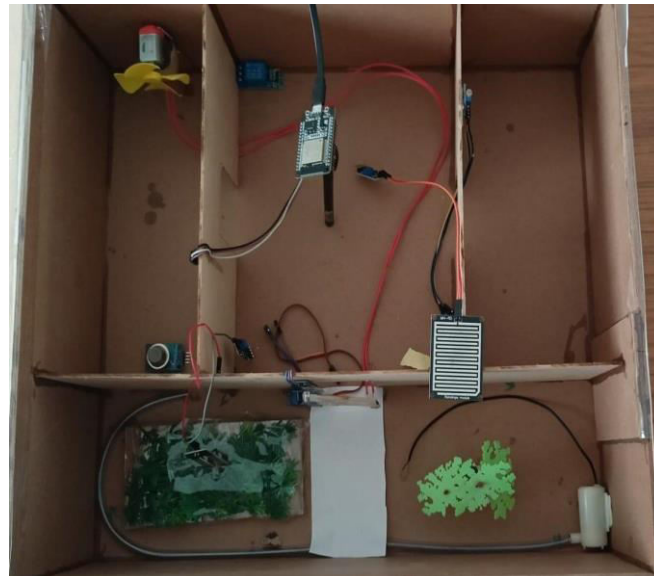
Connection:

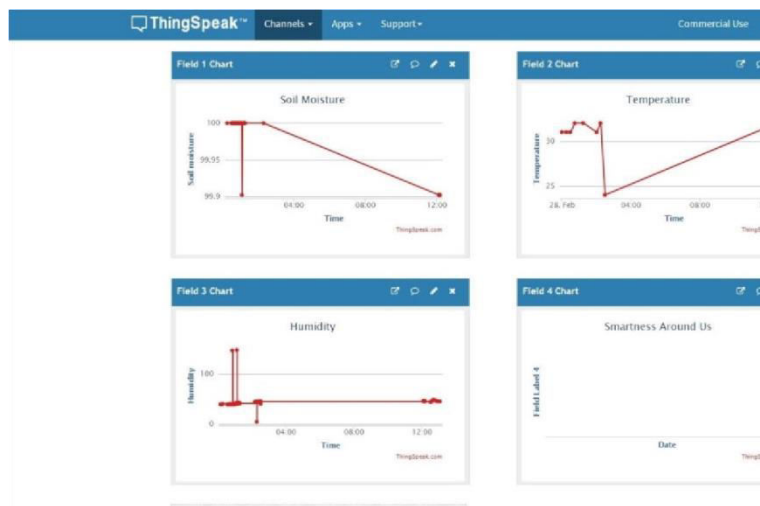Figure.24. Connections of IoT based home monitoring and device control

Figure.25. Things speak channels showing Soil moisture, Temperature, Humidity values

V. CONCLUSION

5.1 CONCLUSION

This proposed system improves the performance of various devices at home by controlling automatically and remotely[1]. The system works in three phases. In first phase the system monitors temperature, gas leakage, water level of the tank and person detection and upload the data to cloud (things speak) and mobile app (MIT app inventor). In second phase the system automatically controls the motor pump and gas knob when water level reaches the maximum and gas leakage detected respectively. In third phase user can control home appliances like fan, light etc using mobile app. The system in build using lowcost [2] embedded microcontroller with WiFi module ESP32.The developed system cost is low, simple to operate and is easily embedded with home appliances

5.2 FUTURE WORK

The going with stage for home robotization advertise will happen subject to a couple of key overhauls in the progression open in Automation, for example, improvement in Wireless Automation blueprints and moreover bringing down of regard appears as the market starts perceive Home mechanization use in more noteworthy volumes. A couple of examples that we foresee for this time of the business are

- Big   associations   like   Philips,
Siemens and Schneider will as time go on bring out truly mass-market mechanization things with interfacing with UI in any case at lower esteem point as contrast with today, and more people will be able to bear the cost of the things.

- Some remote players will have claim to fame in awesome motorization and focus on the prevalent market.

REFERENCES

1. Pavithra ,Sathya ,Pradheepa ,Ramana ,Vijay K and Veerakumar S (January 2020),Smart Assistance for Visually Impaired Person ', JSRD , Volume-8, Issue-1,2020.
2. Amuthavalli.M, Indhumathi.P, Meena.P,Mohanapriya.P,Veerakumar.S(March 2017) ,Traffic Management and Climate Monitoring System using Wireless Communication with IOT', SAJT,Vol. 3, No. 2.
3. Bharath K, Reddy and Ch.RajendraPrasad(2013), 'The embedded Web server based Electrical   Ethernet Monitoring system using ARM', Int. Jr. of Adv. Research in Comp. & Comm. Engg. Vol. 2, Issue 5, 2013, pp. 2292-2295.
4. Bhide V.H and Wagh S (2015), 'ilearningIoT: An intelligent selflearning system   for   home   automation using IoT',2015 International Conference on Communications and Signal Processing (ICCSP), Melmaruvathur, pp. 1763-1767.
5. Bhuvanesh D, HegdeManjunath and
6. Manikandan J (2019), 'Design
7. Development of a Mobile Wireless Video Streaming Mote', 5th IEEE International Conference on Wireless Communications Vehicular Technology Information
8. Theory and Aerospace and Electronic Systems
9. Cook D. Jand Youngblood M
10. (2004), 'Smart Homes, Encyclopedia of HumanComputer Interaction'
11. Deepak N, Ch. Rajendra Prasad (2018),' Patient Health Monitoring using Io', IJITEE, Volume-8 Issue-2S2,pp. 454457.
12. Diptanil Chaudhuri (2015), 'GSM based home security system',IJETR,
13. Vol.3, Issue-2.
14. Folea S, Bordencea D, Hotea C and Valean H, (2012) 'Smart home automation   system using Wi-Fi low power devices', IEEE   International   Conference   on
15. Automation Quality and Testing Robotics.
16. Javale D, Mohsin M (March 2013), 'Home Automation and Security System Using Android ADK', Vol. 3, Issue 2, pp 382-385

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