

VOICE BASED HOME ASSISTANT USING IoT

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Abstract : Home assistant is one who works according to the order given to it. Using nothing but our voice, after receiving the meaningful voice, one can play music, browse the website, generate lists of shopping, online ordering, current weather reports, and to control popular smart-home appliances accordingly. These entire things have been done while our smart phone will be staying in our pocket. The paper enables us to control smart home devices (Electrical Devices or Sensors) by the commands given by our voice. Our voice is processed by third party voice assistant and sent to the free open source cloud for extraction of words from our voice, the skill is invoked and the request is sent to the remote smart home server to perform the action in response to the command. The smart home performs the desired action and then gives a voice response which is read out by a device running.

IndexTerms - IoT, AI, COM , NC, Raspberry Pi B3, PHP etc.

I. INTRODUCTION

The potential Internet of Things application areas like Smart Cities, Smart Car ,Smart computation, Smart Home , Smart Industries, Public safety, Energy & environmental protection, Agriculture and Tourism has been coming as part of a future (Figure 1)IoT based Ecosystem. [1].

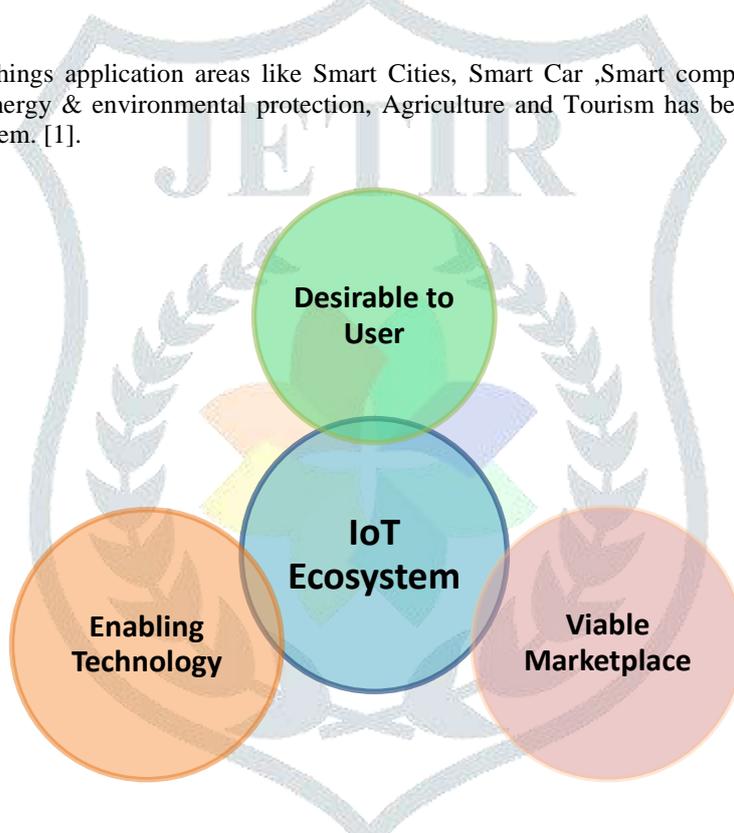


Figure 1: IoT Ecosystem

After looking this development, the majority of the governments including India have also considered now the Internet of Things as an area of innovation and growth. Although many of players in some application areas have been not recognize their potential in this new field, However some of them have pay high attention or even accelerated the pace by coining new terms for the IoT and adding additional components to it. However, end-users in the private and business domain had nowadays acquired a significant competence in dealing with smart devices and their networking applications [5].

The Internet of Things is not only a single technology; it's a concept in which most new things are collectively connected and structure enabled. For example street lights being networked and things like embedded sensors, image recognition functionality, augmented reality, and near field communication are integrated into situational decision support, asset management for new services. These could bring many business opportunities and add to the complexity of IT. [2]

II. VOICE BASED CONTROL

Voice command would be used to get readings from the sensors connected to the speech recognition unit figure 3. A person would have to speak using the pre-set invocation phrases. This request would then be mapped to the skill corresponding to the invocation name. After this an object would be created and sent to process and send back the data containing the reading from the digital sensor.[8] The received data would be given to voice recognition sensor to perform action. Hence the action has been performed.

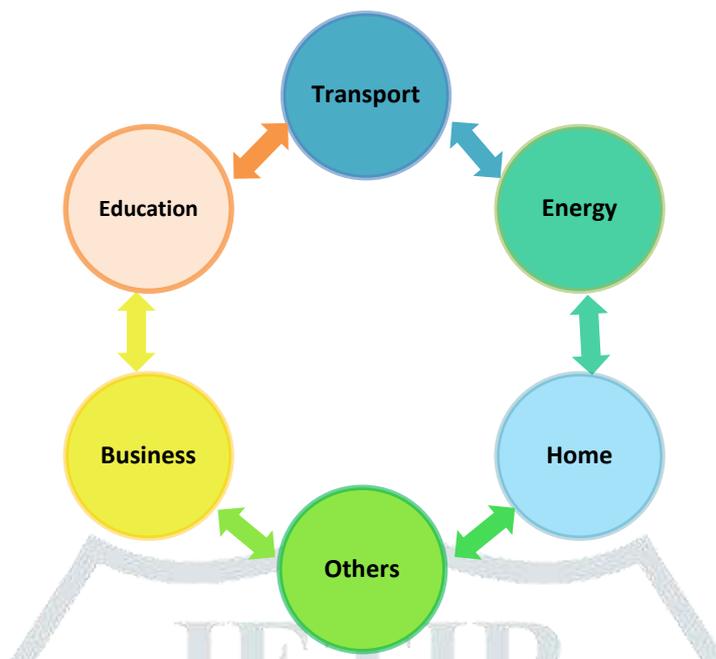


Figure 2: IoT as Networks of Network



Figure 3: Operation based on Voice Command

III. RELAY MODULE

The relay is an electrically operated switch of main voltage. It means that it can be turned on or off, letting the current go through or not. Controlling a relay with the Arduino is as simple as controlling an output such as an LED.

Pins in a Relay Module: - I. COM: common pin II. NO (Normally Open): No any contact found between common pin and normally open pin. So, when we trigger the relay, it connects to the COM pin and supply is provided to a load. III.NC (Normally Closed): There is contact between the common pin and the normally closed pin. There is always connection between the COM and NC pins, even when the relay is turned off. When you trigger the relay, the circuit is opened and there is no supply provided to a load[10].

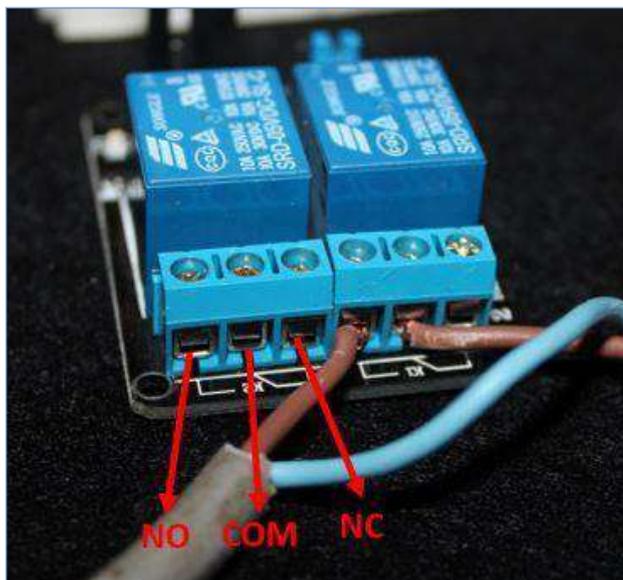


Figure 4: Relay Module

IV. TOOLS AND TECHNIQUES USED FOR HOME ASSISTANCE

The software and hardware has combined to get Home assistance service. Figure 5 shows the invocation of request voice after this the command generated for performing the task as assigned.

Normally one can do it by manually but after applying home assistance it is automatically done through this device. As in Figure- 6, We have used hardware here Raspberry Pi B3 with 1GB RAM and minimum 8GB memory card, external agent to work as Receiver – Transmitter from cloud and electrical device to demonstrate the usage. The software taken for the implementing Home assistant are Python 3 , Ngrok Server, Flask Ask framework, PHP, Apache Server.

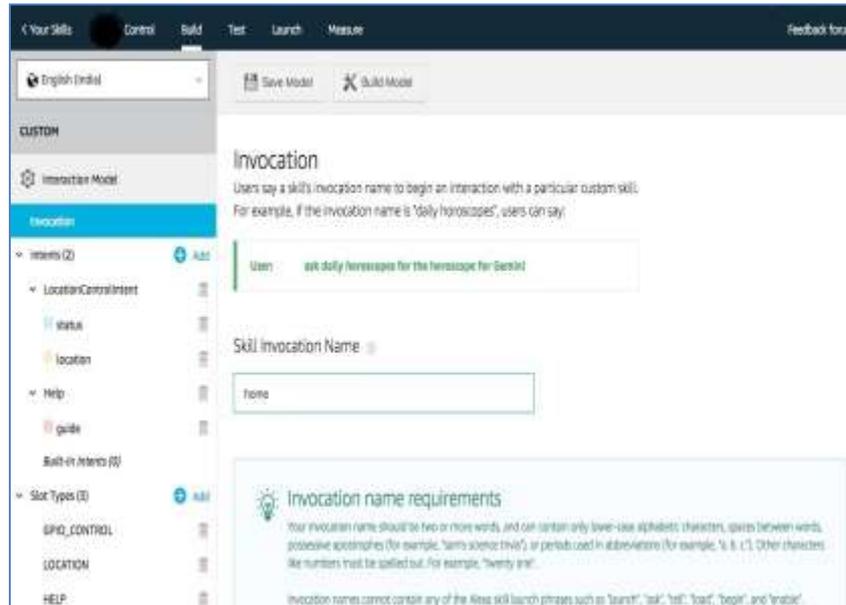


Figure 5: Invocation of voice request

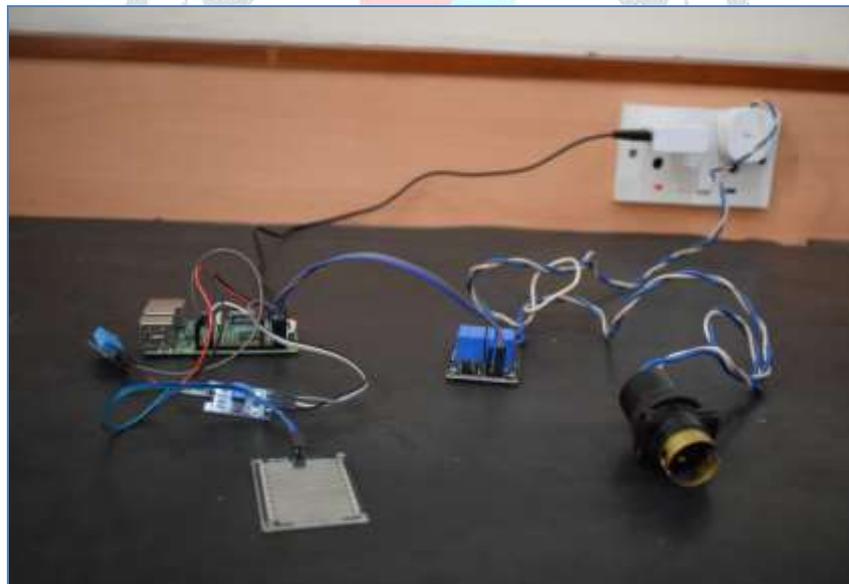


Figure 6: Voice based Home Assistant

V. ADVANTAGES OF VOICE BASED HOME ASSISTANCE

The main thing behind voice based task doing software should have the ability for technology to convert a human voice into a recognizable data pattern. Everyone who speaks an accent or simply the way a phrase could be put together as command. That makes possible for the device to translate without being got trained. All voice activated software applications and programs that are compatible with service assistance are going to require specific tools [3].

These are some major advantages of voice based home assistance:-

- A. **Simplifying the home task:** Now day's smart home technology into our home is among the major priorities for performing daily routine tasks. Adding simplicity to home assistance means increasing user convenience. We can unlock room door from our voice and receive any alerts regarding our home appliances. These all things will be simplifying our task with more conveniently.

- B. Improve the task accuracy:** As we already aware that for an effective improvement *in* efficiency and *accuracy* rate, our method could be modified to obtain the optimal parameters for the desired *task*. Sensors accuracy has increased the level of efficiency in home appliance as compare to manual work.
- C. Time saving:** Finding out the time-saving appliances will allow us to be more innovative and successful. Operating several home task requires a lot of time and resources, the most valuable resource we need to manage is time. Voice based home assistance dramatically reduce the response time of services.
- D. Reduces budget:** Cost effective appliances are always play major role at ground and liked by all users. Cheaper the making charges of home assistance devices enable widely promotion over the market place. As we know the assembling cost of our device is very significant, which reduces the budget.

VI. CONCLUSION

The research work is capable of receive data from sensors connected at the smart home as getting voice output from cloud. It can make the smart home talk in the closed AI Environment, with pre-trained commands. Sending Visual Cards to identify the device status is also possible. Unknown commands are handled by giving custom error message's so the user can try again. System has been controlled using voice from external agent and the voice feedback is generated from software after successful completion of the task.

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