AMAZON ALEXA VOICE ASSISTANT ON THE BASE OF RASPBERRY PI AS EFFECTIVE INSTRUMENT FOR COMMUNICATION

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This paper describes and analyzes the development of Amazon Alexa voice assistant based on Raspberry Pi single-board computer. Also it describes the design of the voice assistant system, its system architecture with the hardware and software description which is required to keep the voice assistant up and running. As result in this paper will explained the implementation and testing of the voice assistant system working through its installation, launching, management and testing of the voice assistant system.

The main purpose of this paper is to implement a reliable voice assistant on mini embedded computer system. Voice assistants are very effective ways to organize our schedules. Almost all large technology companies have developed their own voice assistant – Amazon (Alexa), Google, and Apple (Siri) all developed ways to interface voice technology with so-called "Smart Homes". For example, Amazon Alexa is a home speaker and "virtual assistant" personified by its call-name "Alexa." It responds to voice commands to perform a wide range of functions such as playing music, providing news and weather updates, managing daily reminders and alerts, and working with a host of other subscription-based services and "smart home" devices.

For implementation of own voice assistant will based on an embedded system and Raspberry Pi. An embedded system is a computer system with a dedicated function within a larger mechanical or electrical system, often with real-time computing constraints. Embedded systems range from portable devices such as digital watches and MP3 players, to large stationary installations like traffic lights, factory controllers, and largely complex systems like hybrid vehicles, MRI, and avionics. Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure.

The Raspberry Pi is a series of small single-board computers developed in the United Kingdom by the Raspberry Pi Foundation to promote the teaching of basic computer science in schools and in developing countries.

The installation of the Amazon Alexa on the raspberry will start from installing raspbian OS on the SD card and connecting necessary hardware as follows. Hardware required: Raspberry Pi, Power adapter, HDMI cable, LAN cable, SD card and reader, Wireless keyboard and mouse, a computer to run the

installer (Etcher was used as the installer). Raspberry is then connected to a computer via Virtual Network Computing (VNC) viewer. VNC is a graphical desktop sharing system that uses the Remote Framebuffer protocol (RFB) to remotely control another computer. Before launching of the Amazon Alexa voice assistant based on Raspberry Pi single-board computer,we need to create our own Amazon developer account and create a profile for our DIY echo. We create a new profile and a security profile name. After setting up our profile, we setup the web settings since our device works with the internet..When we're done with the profile and web settings on AVS, we set up the terminal on our raspberry Pi. We update our device and install the scripts that will get Echo up and running.After succesful setup and log in alexa will automatically start up itself.

Afer the full installation of the echo on raspberry Pi, we put it to test. To be sure it was working appropriately.We logged in to the AVS for the account we created earlier on and it looks blank I the beginning, but once we start conversing with Alexa we see the questions asked abd the answers in the screen just to confirm it's working perfectly.

The advantages of designing our own voice assistant system on raspberry Pi is

- Raspberry can be used as a mini computer alongside the voice assistant.
- It is less expensive compared to the real voice assistant.
    The disadvantages of designing our own voice assistant system on raspberry Pi is
- There are limitations to what Alexa can do.
- It doesn't support the alexa-to-alexa calling like the echo devices.
- And some of the features are locked in this region.(Traffic reports).

Overall, Voice assistant system was perfectly designed and implemented, and then it has been tested for unknown users.

List of references

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