ANDROID BASED HOME AUTOMATION

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Abstract: This assignment affords the general layout of a Home Automation System (HAS) with a low value and wi-fi gadget. This gadget is designed to help and offer aid that allows you to satisfy the wishes of the aged and disabled with inside the domestic. Also, the clever domestic idea with inside the gadget improves the usual of residing at domestic. . The transfer mode and voice mode are used to manipulate the house home equipment. The video remarks is acquired with inside the android software which streams the video of IP- Camera. The important manipulate gadget implements wi-fi generation to offer far flung get entry to from clever phone. The layout stays the present electric switches and gives greater protection manipulate at the switches with low voltage activating method. The switches repute is synchronized in all of the manipulate structures wherein each consumer interface suggests the actual time current switches repute. The gadget meant to manipulate electric home equipment and gadgets in residence with a enormously low value layout, consumer-pleasant interface and simplicity of installation.

Keywords: Android, Raspberry Pi, WIFI, Automation, Fan, Light.

I. INTRODUCTION

The "Home Automation" idea has existed for lots years. The terms "Smart Home", "Intelligent Home" observed and has been used to introduce the idea of networking home equipment and gadgets with inside the house. Home automation Systems (HASs) represents a extremely good studies possibility in growing new fields in engineering, and Computing. HASs consists of centralized manipulate of lighting, home equipment, safety locks of gates and doorways and different systems, to offer progressed comfort, power performance and safety machine. HASs turning into famous these days and input quick on this rising market. However, give up users, mainly the disabled and aged because of their complexity and price, do now no longer usually be given those systems.

Due to the development of wi-fi technology, there are numerous extraordinary of connections are delivered including GSM, WIFI, and Bluetooth. Each of the relationship has their very own precise specs and applications. Among the 4 famous wi-fi connections that regularly applied in HAS challenge, WIFI is being selected with its appropriate capability. The skills of WIFI are greater than sufficient to be applied with inside the layout. Also, maximum of the contemporary laptop/pocket book or Smartphone include integrated WIFI adapter. It will not directly lessen the price of this machine.

This challenge forwards the layout of domestic automation and safety machine the use of Raspberry pi, a credit score sized computer. Raspberry pi affords the functions of a mini computer, extra with its GPIO pins wherein different additives and gadgets may be related. GPIO registers of raspberry pi are used for the output purposes. We have layout a electricity strip that may be without problems related to GPIO Pins of the Raspberry pi. The domestic home equipment are related to the input/output ports of Raspberry pi together with the electricity strip and their reputation is surpassed to the raspberry pi. The android strolling OS in any telecellsmartphone related to a community can get entry to the reputation of the house home equipment through an application. It gives the layout and implementation of automation machine which could display and manipulate domestic home equipment through android telecellsmartphone

II. PROJECT OBJECTIVES

Android managed Smart Home Automation need to be capable of manage the house home equipment wirelessly with efficaciously and efficiently.

Controlling Home Appliances through Application (Switch and Voice Mode)

To broaden an utility that consists of the capabilities of switches and voice mode utility. Switch Mode or Voice Mode may be used to manipulate the switches of domestic home equipment.

Real Time Video Streaming from IP digital digicam

To acquire the pleasant video from the digital digicam to the android utility.

Secure Connection Channels among Application and Raspberry pi

Use of steady protocols over Wi-Fi in order that different gadgets can not manage the home equipment. Options for steady connection is SSL over TCP, SSH

Controlled via way of means of any tool able to Wi-Fi (Android, iOS, PC)

To make the house home equipment bendy in manage, any tool able to Wi-Fi connectivity will capable of manage the house home equipment from far flung location.

Extensible platform for destiny enhancement

The utility is to be tremendously extensible, with opportunity of including capabilities withinside the destiny as needed.

SCOPES

The challenge objectives at designing a prototype for controlling the house home equipment that may be managed wirelessly thru an software that gives the functions ofspeech recognition, video streaming, and transfer mode. An software is administered on android device. The machine may be utilized in extensive variety of areas.

The machine incorporated with one-of-a-kind functions may be carried out withinside the following fields.

• The machine may be utilized in domestic, small workplaces to the huge malls

The machine may be used from domestic to workplaces to manipulate the electric home equipment.

• For faraway get entry to of home equipment in net or intrenet.

The domestic/workplace home equipment may be managed in intra-community or may be accessed thru net.

• For the improvement of generation pleasant environment

The machine consists of the usage of generation and making clever domestic automation. By the usage of each day devices we will make use of them for one-of-a-kind prospective.

. Technology Exposures That Project Provides:

1. Google's Android open source technology.
2. Wi-Fi technology.
3. Interfacing Wireless Adapter to Raspberry pi.
4. Interfacing relays with ac and dc power sources.
5. Using Transistor as a Switch.
6. Embedded program

Project Management

This undertaking constituted improvement of utility as its principal component in addition to the hardware to govern domestic home equipment. Management of any undertaking has numerous steps or tactics in it. So, our tasks may be defined beneath neath the subsequent steps: 1.5.1. Experimentation In this step, we have been discussing approximately the important equipment and materials. We have been reading approximately the same tasks, accumulating the facts of the programming language to be used. We have been growing easy algorithms and flowcharts. 1.5.2. Design In this phase, we have been designing the format of the utility. The important capabilities to be included. We have been designing the strength strip to attach the house home equipment that may be managed through GPIO pins. 1.5.3. Development and Testing In this phase, the improvement of utility became performed. The insects have been recognized and removed. We consulted many software program specialists for the assessment of our utility. Hardware layout consists of the layout of strength strip. 1.5.4. Real-World Testing Finally, our device became geared up to be examined with inside the actual electric home equipment.

III. BLOCK DIAGRAM OF PROPOSED SYSTEM
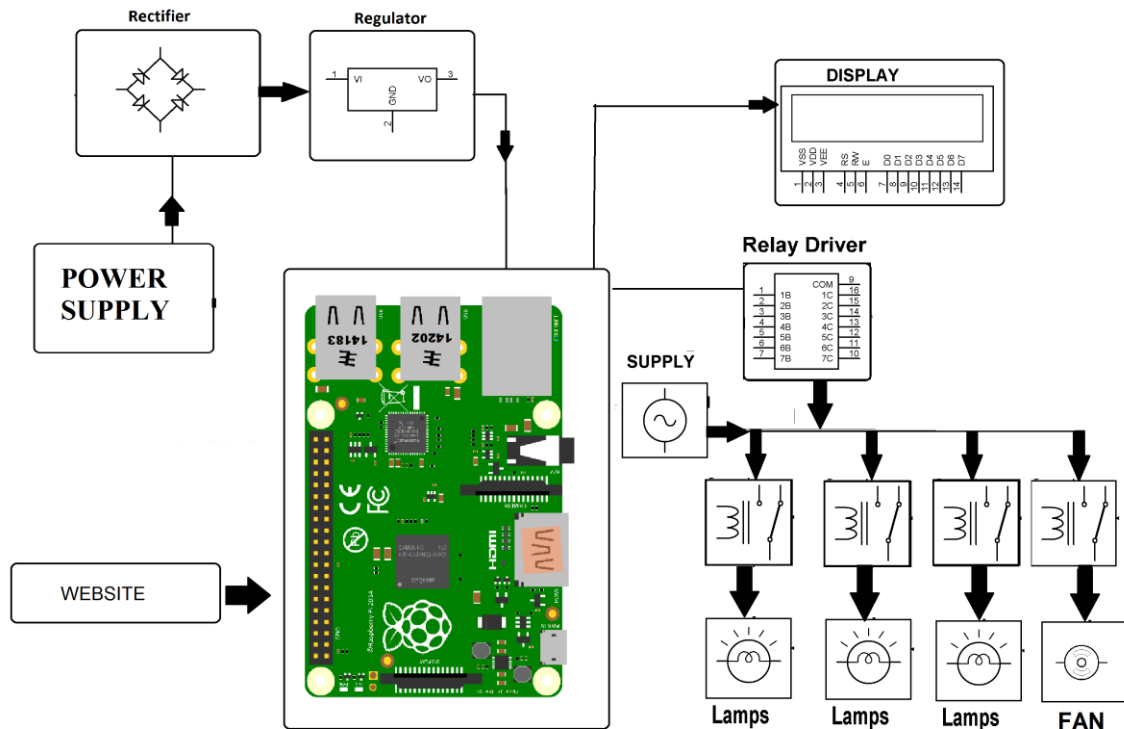
IV. PROPOSED SYSTEM

The Android OS offers the ability the usage open-source. The built-in sensors may be accessed easily. We have constructed software with the following capabilities. Android Phone acts as a purchaser and information are despatched thru sockets programming.

1. Switch Mode
2. Voice Mode
3. Video Mode

Switch mode makes use of the radio buttons which are used to manipulate the house home equipment. The radio button sends the popularity of the transfer.

Voice Mode is used to manipulate the house home equipment the usage of voice command. Using the built in microphone of Smartphone, the software creates an reason that fetches the speech information to the Google server which responds with a string information. The string information are similarly analyzed after which processed.

Video Mode indicates the video flow of the room. The captured video is streamed on the android software.

All the gadgets are linked to a not unusual place community. Smartphone, raspberry pi and IP digital digicam are linked to the not unusual place community Router is used to create a not unusual place community.

Wi-Fi Adapter is used to attach raspberry pi to the community. Raspberry pi is used to hold the server. The pi collects the information analyses it and similarly turns on GPIO pins as necessary. The GPIO pins of raspberry pi are linked to the relay. Relay transfers are used to attach the house home equipment.

IP Camera

This safe digital digicam can provide you the liberty to get your own home or enterprise surveillance thru the community each time and everywhere. It comes with an alarm function, whilst any individual seems at the digital digicam beneath neath alarm function, it's going to take a photograph or sound the alarm and electronic mail the photos to you immediately. IP digital digicam may be utilized in numerous places, inclusive of warehouse, office, supermarket, and doorkeeper, and so on.

IP digital digicam is integrated with the following capabilities.

1. Inbuilt Microphone and Mic. These offer manner communications among far-off consumers and the character status in the front of digital digicam.

2. Alarm Service Setting offers the capabilities of alarm whilst detecting the unauthorized motion of consumers.

3. File Transfer Protocol Setting and Email Setting Provides the capabilities of emailing the video flow or pics on the ordinary c language of the time.

Advantages of Wi-Fi over different wi-fi technology like Bluetooth and ZigBee:

Bluetooth is usually used for factor to factor networks and Bluetooth operates at a miles slower charge of around 720 Kbps which may be very small for video switch or transferring huge quantity of information just like the photo captured from a digital digicam, while the bandwidth of Wi-Fi may be as much as 150Mbps and really best for video transmission.

Wi-Fi may be very a lot stable way of conversation than Bluetooth.

Wi-Fi connection to ship video, audio, and telemetry operation, whilst accepting far-off manage instructions from an operator who may be placed actually everywhere withinside the world.

Robots are already being eyed for apparent obligations like undertaking seek-and rescue missions in the course of emergencies or hauling tools for infantrymen withinside the jungle or woods. The mechanics of the robotic makes use of the idea that has been evolved to make certain strong navigation, seek and transportation in hard terrain.

V. Solution Details

Hardware Environment

Control electronics

• Raspberry Pi because the controller for its processing strength and huge developer community.

• four relays are related to strength strips.

• GPIO pins are related to transistor. Transistors are used as switch.

Software Environment

1. Android Developer Tools (ADT)

- To construct the android software to obtain the stay video feed from the digital digicam and to ship the manage indicators to govern the robot.

2. RPI-GPIO library

- GPIO interface library for the Raspberry Pi.

VI. Scope and Applications.

This machine is designed to help and offer assist that allows you to satisfy the wishes of the aged and disabled in the home. Household home equipment may be effortlessly managed through a Mobile/Tablet. The status of light, fan, and different electric home equipment may be known. With the assist of an IP camera, video of rooms or the positive region of a residence may be recorded. This allows offering security.

VI. Further Enhancements

Looking on the contemporary scenario we are able to construct move platform gadget that may be deployed on diverse systems like iOS, Windows. Limitation to manipulate best numerous gadgets may be eliminated via way of means of extending automation of all different domestic appliances. Network may be related to net and Security cameras may be managed from different places, permitting the person to study interest round a residence or business. Security structures can consist of movement sensors so one can locate any type of unauthorized motion and notify the person. Scope of this mission may be improved to many regions via way of means of now no longer limiting to best domestic.

VII. Conclusion

The high goal of our task is to apply the Smartphone to manipulate the house home equipment effectively. The transfer mode and voice mode are used to manipulate the house home equipment. The video remarks is obtained withinside the android app which streams the video of IP- Camera. This task is primarily based totally at the Raspberry pi, Android platform Java and Python. These structures are Free Open Source Software. So the general implementation price is low and may be without problems configured. User can without problems have interaction with the android phone/tablet. The person can ship instructions through the transfer mode or speech mode. The information are being analyzed through the utility and are despatched over a network. The Raspberry pi acts as a server, analyses the information and turns on the GPIO (General Purpose Input Output) Pins. The GPIO Pins are linked to the relays

transfer which activated the desired domestic home equipment. In this way, automation system is carried out. This is a easy prototype. Using this as a reference similarly it is able to be improved to many different programs.

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