

SMART HOME WITH POWER CONSUMED STATISTICS USING ANDROID APPLICATION

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Abstract - In our day-to-day life, today we need each and everything smart, i.e. smart phones, smart watches, etc. In this paper we propose Smart Home where home appliances like lights, fans or blinds can be easily operated through our Smart Home android application. This android application also keeps track of the power consumed by appliances and sets a limitation for daily power usage. Hence, when power consumed exceeds the limitation, an alert notification would be sent for the same. The aim of this paper is to carry out a low-cost, reliable and scalable Smart Home System that can be used to remotely operate household appliances and check daily power consumption.

Key Words: Smart Home, android application, light intensity control, speed control of fan, automated blinds, power consumption, Arduino nano.

1. INTRODUCTION

Automation of home refers to automation of various household activities or housework. Automation of home may include controlling light intensity, controlling speed of fan, automating blinds depending upon light intensity, automated door lock, and various other systems to provide comfort, ease of work and security. A smart home (SH) is an Internet of Things (IoT) application that allows users to control and monitor home appliances in real time over the Internet [3, 4]. A widespread of technology controlling home appliances has started by using mobile devices with short-range communication interfaces, such as Bluetooth and ZigBee [5], and by Wi-Fi networks. Home automation for the elderly and disabled can provide increased quality of life for persons who might otherwise require caregivers or institutional care [1].

“Ease use of appliances” is the main motive of the system [2]. Looking at this we have controlled fan and light appliances through an application, whereas the curtain(blind) appliance is automated. These appliances can be monitored and controlled through a user-friendly interface. All appliances are connected to the Arduino board which is the main controller board. This system also contains a module of daily monitoring power consumption by the appliances and sending an alert if it exceeds the limitation. By using the Internet of Things (IOT), the development of home automation is going to become simpler and hence developing an android application will help connect objects to provide proper communication, synchronization, and

inter-connection between various devices or physical appliances.

2. BACKGROUND OVERVIEW

A. Approach

The concept of the word “smart” is being used in various fields such as smartphones, smart TVs and smart learning, including smart homes. The idea of Smart home service has been activated since the mid-2000s. “Ease use of appliances” is the main motive of the system. The application is used by the user while operating the appliances which can be easily helpful in ensuring privacy and security thereby having a login authentication in the app. The background of this project is as follows:

- It gives a graph of daily power consumption.
- If the limit exceeds then it will alert the notification.
- It can be helpful for handicapped as well as elderly and everyone to use the appliances easily using a simple Android application.

B. Drawback of Existing System

The existing system has the drawback about the application. In the previous model the appliances were only connected with the Android application, they were not representing the power usage graph.

Also, there was only an ON/OFF button in the application for the appliances used. The proposed system emphasizes more on the power usage graph and there is speed control buttons as well.

C. Proposed System

The proposed system revolves around the android application by which it controls all the appliances of home. It has different sensors which operates some of the appliances as well. The power usage by all the devices has been shown in the form of graph which is daily consumption of power. The easy usage of home appliances is undertaken in the proposed system with a simple login authentication which maintains security as well.

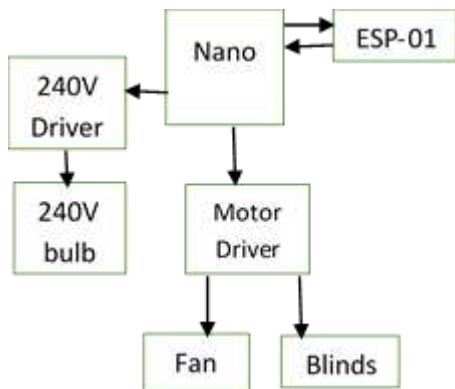
3. Proposed System

A. System Overview:

The whole proposed system revolves around the automated control of home appliances and tracking the power consumed by each appliance followed by creating a statistical graph on daily basis for the same. It is an IOT and Android based project which offers people to control home environment in efficient and comfortable manner. This Smart Home system consists of hardware and software part with XAMPP server as an interface.

Hardware: Arduino Nano, ESP01, L298 motor driver, LDR module, 10RPM gear motor, etc.

Block diagram:



Software: Arduino, Xampp, Android studio

B. Design

The Smart home application consists of different functions and modules which are:

- a. Login: The system needs to be logged in using username and password considering safety measures for children.



- b. Controller: This module consists of different switches and options to control fan, light or any household appliances. The intensity of light can also be controlled according to our needs. Same for the speed of fan.
- c. Power analysis: This module creates a daily statistical graph of power consumed by appliances.



- d. Alert notification: When the power consumed exceeds the limit, an alert notification is sent to the user.

C. Implementation

After logging into the Smart Home application initially the connection between the hardware system and software application is carried out through Xampp server. Then the options or switches selected are stored as in the database and these values are then triggered in the hardware system.

Fig. 3.1 shows the database in phpMyAdmin xampp server where values of power, fan, light, ldr are stored.

Fan	Light	Power	Ldr	srno
0	0	60	2	2041
0	0	60	3	2042
0	0	60	4	2043
1	0	60	4	2044
1	1	60	4	2045
1	1	60	4	2046
1	100	60	5	2047
1	100	60	6	2048
1	1	60	6	2049
1	100	60	7	2050
1	100	60	8	2051
1	100	60	8	2052
1	100	60	9	2053
1	100	60	9	2054
1	100	60	10	2055

fig. 3.1

Fig. 3.2 shows the flowchart of working of the Smart Home application.

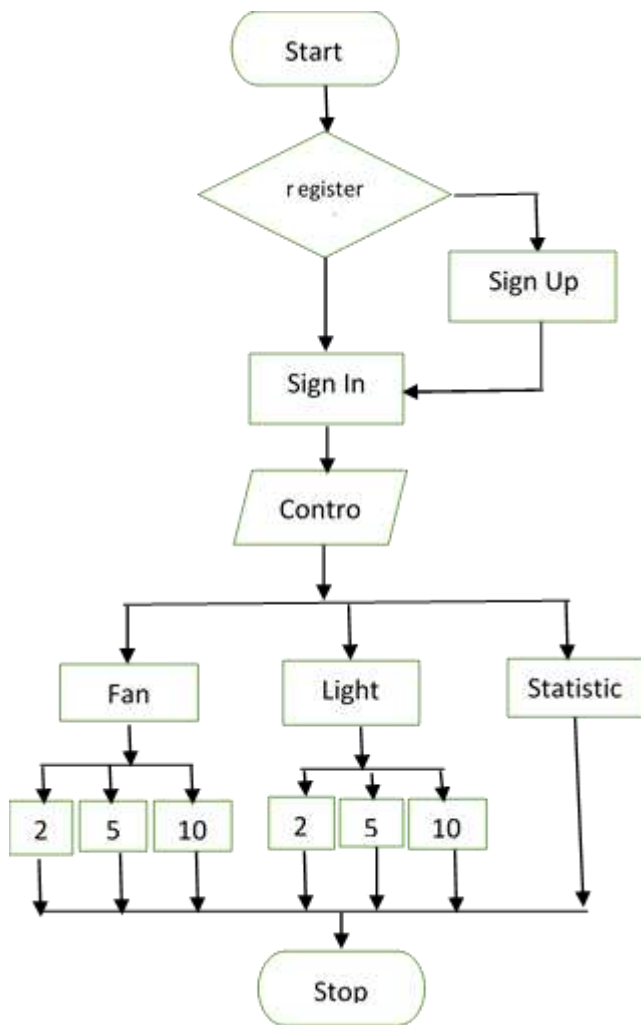


fig. 3.2

4. CONCLUSION AND FUTURE WORK

The idea of Smart Home is not new, but rather this project concentrates on focusing on the daily power usage of the appliances. The "Ease of application" is successfully implemented in this project by operating all the Smart Home appliances using an Android app which can be easily installed in mobile phones. The power usage gives the graph about the current and voltage supplied to the system which can prevent the system from Short circuit and power failure problems if it exceeds the limit. This project is also useful for handicapped and elderly people who cannot move every time to operate the devices. The security and privacy are also determined in this project.

The future work regarding this project would be able to use this on a large scale in any organization like schools, colleges, etc. They can also implement the power saving module giving alert notification on the mobile phone as well.

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