

Efficient Low Cost Supervisory System for Internet of Things Enabled Smart Home

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ABSTRACT: Advancement in IoT based application has become the state-of-the art technology among the researcher due to the availability of Internet every where. To make the application more user friendly , web based and android based technologies have gained their importance in this cutting edge technology .In this paper ,smart energy efficient home automation system is proposed that can access and control the home equipments from every corner of the world. For this system, Internet connectivity module is attached to the main supply unit of the home system which can be accessed through the Internet .For wireless connectivity, the static IP address is used. Home automation is based on multimodal application t hat can be operated using voice recognition command of t he user using the Google Assist ant or through a web based application. Thus, main objective of this work is to make our home automation system more secure and intelligent. Home Automation System (HAS) gains popularity due to communication technology advancement. Smart home is one of the Internet of Things (IoT) applications that facilitate the control of home appliances over the Internet using automation system. This paper proposes a low-cost Wi-Fi based automation system for Smart Home (SH) in order to monitor and control home appliances remotely using Android based application.

KEYWORDS: IoT , HAS, SH, Wi-Fi.

I. INTRODUCTION

The large diffusion of smart devices with embedded sensors and wireless interfaces have enabled the rapid advancement of Internet of Things (IoT). The IoT plays a remarkable role in improving the quality of life and growing the world's economy. It facilitates global connectivity over the world-wide physical objects (e.g., sensors, RFID, smartphones, vehicles, appliances) to serve people in a collaborative manner automatically and intelligently. The vision for the IoT states that various "things" are going to be connected and will be controlled across the Internet. Application domains of IoT cover smart home, smart healthcare, smart grid, smart transportation, smart city, industrial automation and surveillance. Among various IoT applications, the design of Smart Home (SH) has drawn great attentions from both academic and industrial because it is more related to people's lives. A smart home can be defined in many ways. One definition is a home with an automated system that comprises sensors and device controllers to provide a comfortable, intelligence and secure system to improve the quality of life and control home appliances easily, in particular for elderly and disabled people. The SH automation system as may provide an interface between smart phone or personal computer and home appliances, via a wireless communication interface Bluetooth and Wi-Fi.

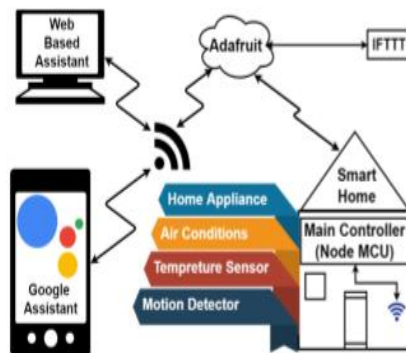


Fig 1 Smart home architecture

There are many of the Home Automation Systems (HAS) that are commercially available and it can be categorized into two main categories: locally controlled and remotely controlled systems [6]. In the first category, users can control their home appliance using an in-home controller with a stationary or wireless communication technology (Bluetooth, Zigbee and GSM) for achieving home automation. In the second category, users can remotely control their homes over Internet connection using their mobile devices or personal computers. However, there are several issues involved when designing such automation system and it should be considered. Home automation system should provide a user-friendly interface to allow setup, monitoring and controlling home appliance easily and efficiently. In addition, the automation system should be fast enough and provide reliable connection with acceptable data rate and communication range to realize the true power of wireless technology [8]. Finally, the system possesses and justifies its application in home automation. To overcome these design issues and minimize the shortcomings of home automation systems, this paper proposes an integration for locally and remotely controlled home automation systems. The proposed system will provide a locally controlled home automation system via a Wi-Fi interface and the low cost Arduino microcontroller in addition to the use of the IoT concepts for remotely control. This allows the system to be independent of both user location and mobile provider. It also allows the developed automation system to be used locally with various Android-based smart phones via Wi-Fi or to operate remotely via an IoT platform which allows individuals to manage, monitor, and control their appliance and devices through the Internet.

II. IMPLEMENTATION

This system also takes records of the car and their permits and other documents. All cabs have proper permits and documentation so that the clients could not be hassled for the lack of documents. This system also keeps records of the car drivers and admin can check driver related information like his name, address, id documents and which car he is driving on booking etc. Cab drivers' communication, GPRS technology has been widely applied, GPRS is General Packet Radio Service for short, it mainly consists of three parts: data acquisition module, GPRS network and a remote server. The system uses a GPRS 1090 module that supports dual band GSM/GPRS, it has a complete embedded TCP/IP protocol stack, and provides RS-232/485 interface and multiple data centers. Its main function is to transmit the data to the server via GPRS network. It abstracts the network request, and each request serves as a Service. And it objects the request parameters and return values, the callback function can be customized freely.

III. SYSTEM ARCHITECTURE

The proposed application Cab Booking project system ensures that the customer can book the cab as per their requirements by logging on to the app. Based on the microcontroller, it is composed of control module, WI-FI module, GPS module, power module, signal process module, USB interface with isolation. Android client collects and directly displays the batteries information by the powerful design of UI interface in android. Besides, the application stores the data in the local database and uploads them to the server.

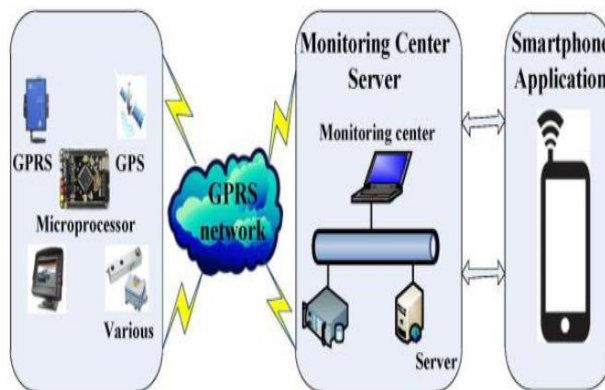


Fig No:2 System Architecture

IV. EXISTING SYSTEM

- Advancement in IoT based application has become the state of the art technology among the researcher

due to the availability of Internet everywhere.

- To make the application more user friendly, web based and android based technologies have gained their importance in this cutting edge technology.
- Smart energy efficient home automation system is proposed that can access and control the home equipments from every corner of the world.
- For this system, Internet connectivity module is attached to the main supply unit of the home system which can be accessed through the Internet. For wireless connectivity, the static IP address issued.

4.1 DISADVANTAGES

- Do not have voice assistance in automation.
- Detection of Room Temperature is Appropriate.
- For measuring a distance complex coding is needed.
- Software implementation is complex

V. PROPOSED SYSTEM

The supervisor system enables the user to obtain information about the power consumption by the devices; in addition, the meter reading can be obtained directly. That means the devices will send the power consumption rating to the supervisor system with the help of a dedicated hardware that can be implemented using a simple microcontroller.

5.1 ADVANTAGES

- A classic algorithm for learning and generating association rules from large dataset.
- Association rule as IF THEN statements that help to discover the relationships between unrelated data in relational database and to her nature of data and property.
- The algorithm is considered as a moderately depth preference selection approach that handles frequent item sets, which are then combined with Association Rules (AR).

VI. METHODOLOGY

CAB SERVER

This is total dynamic project i.e. everything can be changed by admin. Admin can add new type of cabs like hatchback, sedans etc. Admin can also set different types of different cities. Each city can have individual rate for different type of vehicles. Admin can also add new drivers with their vehicle type. Also admin can view bookings made by user and allot cabs for the same. Admin can also update/delete everything. If the driver while filling the fuel they have to update the liter and cost of admin using that app then Admin can easily monitor the driver.

CUSTOMER

In this module user will be able to sign up and login into the app. User can search cab for different cities and book for their preferred time. User can also see his booking history and status of booking like which driver has been allotted etc. Different Validations are applied in the project to ensure proper input by the user. User can also send messages and feedback to site admin. Using this system it is very easy for customer to book a car online and car booking agency can also track their booking online. So it is also very useful for car booking agency.

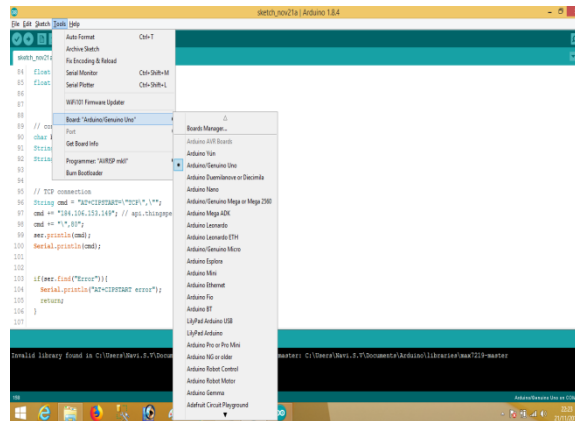
CAB SERVICE

The admin of the application have a full of authority to monitor and allocate the driver. For this application we will store some model names, their registration no, available cabs, rent rate on the basis of per day, each cab driver profiles for security purpose and the amount to be deposited accordingly. Our online cab booking app tracks your current location and offers a variety of online payment options via payment gateways. It allows your customer to make bookings and payments online at any time & from anywhere.

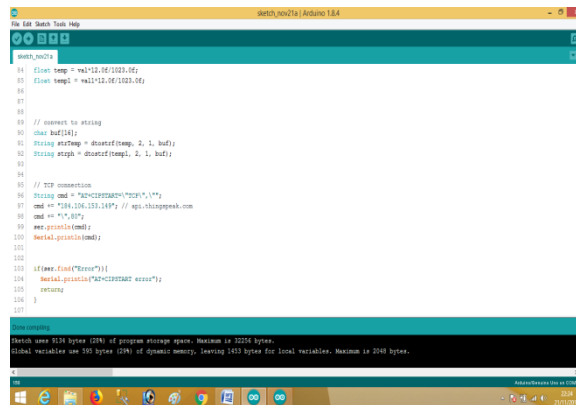
BOOK CAB

The cab booking service provided to customers they have to login the app with individual login id/phone number and password. This brings together the cab operators/admin and the customers. It allows users to book their cabs online, manage their bookings and cancel their bookings at any point of time. The users will get notified about the driver and his mobile no. Customers may view the cab timing at a date their name and their type of booking. After checking the number of cab available the customers books a cab or number of cabs according to their requirements.

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VIII. CONCLUSION

This research project has proposed, designed and fabricated a low cost Wi-Fi based Automation System for Smart Home prototype using Arduino and Android smartphone. It enables the control all the electrical appliances such as the bulb and fan at home easily and efficiently via Wi- Fi. The sensor can monitor the motion, humidity and temperature of the house. Buzzer will be ON when there is a motion detected in the house. The Smart Home Automation System provide a comfortable, intelligence, good security and improve the quality of life. By using this smart home system, electric bill can be reduced because the user can control the electrical appliances anytime without using human energy. The next step of our research will be enabling the remote control of the developed system based on IoT concept so that the user can control it using web server even when they are not around their house. We are going to increase the number and variety of sensors for more safety and security in addition to provide option for the fully-automated of home appliances. We will implement a gateway to connect all sensors to an IoT platform and we may replace some sensors with a wireless sensor to overcome some wiring problems. Our final product should be a compact box which is easy to be integrated to an existing switching board of real houses appliances via relay board and provide safer control

IX. FUTURE ENHANCEMENTS

The admin provide the feedback form to the customer can give the feedback in the app. The customer shall produce repeat business only then if the service availed and used by them creates a certain amount of satisfaction and therefore eventually raising the bar of expectation. The vehicle condition and staff behavior are aspects of a good quality business and, serve as an important metrics for evaluation overall performance of the system. Post the journey, the users are asked to fill in the feedback form and post comments. It uses the information technology in an efficient way for providing better passenger services..

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