

# Online Based Home Automation and Security using .NET Framework

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**Abstract:** The paper present the online based home automation system using .NET framework which provide user friendly GUI and it can be integrated with hardware devices to control the overall appliances of home automation and provide security .

**Index terms:** Home Automation,.NET, Speech.

## I. INTRODUCTION

The automation is being used from several years back . It began with the idea which is the combination of intelligent devices and robotics. In other words, it is the control of devices and appliances by means of a computer or from remote devices. Then the motivation is developed to a recent technology and interaction of technologies and services applied to different system. Different areas where automation can be applied are Industry, Home,car etc Home automation and Security services systems are integrated in many homes and buildings to meet the needs of customer. The home automation refers to domestic environment that improves the quality of the resident's life by a, healthy, and safe environment which is a simple as that . Now-a-days security has been a major issue where crime is increasing and everyone wants to take proper measures to prevent intrusions. As the integrated circuits and microprocessors become more and more accessible and the Internet communication is a fact of today, these enhancement naturally should find use in modern home automation systems.

Industrial Automation system uses PLC and SCADA for controlling and monitoring of different devices and equipments in field .such as for controlling various devices the need of advanced control room where overall pictorial view of devices are seen according to that it can be controlled and change parameters. for example in power plant monitoring several parameters such as gas controlled ,water control and material flow can be easily manipulated and controlled with help of control room and one click of mouse.

Home automation which is small part of automation where devices or appliances can be controlled with help of microcontroller and can react with help of intelligence provided . Provided to microcontroller, there are several other parameters where control of home automation can be done with other technologies such as Bluetooth based ,WIFI based ,Zigbee based., infrared based. The security features which can be controlled and monitored with help of mobile and internet plays a impact role in developing a advanced home automation system .this advanced home automation system can be made user friendly with help of GUI which can be developed with different software .Home automation adds luxury to ones life it can enhances communication between people in society. Home automation uses the latest technology devices such as smoke detector, gas control valve light control, garage door mechanism , fan control and temperature and humidity sensing .room freshing with help of room freshner etc.

## II BACKGROUND OF TECHNOLOGY

The Technology which is to develop the system which uses following to enable user of remotely monitoring, and controlling his home automation system. In this model we proposed three methods of home appliances control which are via .NET framework.

- **Website**
- **Windows application**
- **Speech (SAPI)**

The First is to be designed with help of website with help of remote computer where they would like to access the devices and control the home appliances and monitor and view the location with help of camera and controlled the necessary parameters by making required setting and maintain the database.

The Second is desktop application where the user can control the overall home appliances with help of desktop or windows application where user can check the status of home appliances and change the parameters

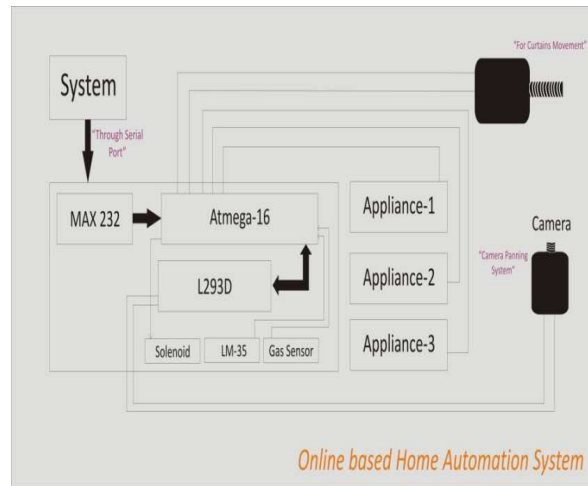
The Third one is designed for the users while they are inside the house for controlling the devices with help of speech ie (SAPI) Techniques.

The main objectives of the proposed system is to design and to implement a cheap and open source home automation system that is capable of controlling and automating most of the house appliances through an easy manageable way to run and maintain the secured home automation system required.

The Online home automation system which will control and monitor the appliances are

- Temperature of room.
- Humidity of room.
- Camera surveillance for movement detection
- Door locks control system.
- Status of the Door
- Database of the Door operation system
- Authentication to person with help of image. .
- Light intensity and Fan speed and curtain opening and closing.
- Gas cylinder valve (regulator) control with help of camera.
- Freeze, Microwave...etc turn on and off.

### III SYSTEM DIAGRAM



The system in Fig1 shows a desktop where the online home automation system is being installed the system application consist of windows application and web application .

In order to achieve interaction with the home automation network from the outside, the use of internet can be done. with the help of internet user can interact with home automation with help of home automation server .

The home automation server can be created as database where all the history and status of home devices can be viewed with help of webpage. The webpage is created in ASP.net .

Visual basic .net is basically framework used for developing desktop application .windows application ,it's a framework developed by Microsoft where the basic application form can be designed using visual basic concept.Its a window based application .

ASP.net is fastest, efficient, reliable and best supported way to create interactive web applications available today. Integrated with the development tools available from Microsoft, it is incredibly easy to create websites that looks great and performs well.

**SAPI:** The Speech Application Programming Interface or SAPI is an API developed by Microsoft to allow the use of speech recognition and speech synthesis within Windows applications. Speech API can be viewed as an interface or piece of middleware which sits between applications and speech engines (recognized).

**Shared Recognizer:** For desktop speech recognition , a recognizer can be used which runs in a separate process . All applications using the shared recognizer

communicate with this instance. This access sharing of resources, removes contention for the microphone and allows for a global UI for control of all speech applications.

**In-proc recognize** For applications that require explicit control of the recognition process the in-proc recognizer object can be used instead of the shared one.

**Grammar objects:** Speech grammars are used to specify the words that it is recognized. SAPI defines an XML markup for defining grammar for speech in code. Methods also exist for instructing the recognizer to load a built-in dictation language model.

**Voice object.** This performs speech synthesis, producing an audio stream from text. A markup language can be used for controlling the synthesis process.

**Audio interfaces:** The runtime includes objects for performing speech input from the microphone or speech output to speakers (or any sound device) from wave files. It is also possible to write a custom audio object to stream audio to or from a non-standard location.

The hardware devices which are used are AVR ATMEGA16 microcontroller which is 16 bit microcontroller The ATmega16 provides 16 Kbytes of In-System Programmable Flash Program memory with Read-While-Write capabilities, 512 bytes EEPROM, 1 Kbyte SRAM, 32 general purpose I/O lines, 32 general purpose working registers, three flexible Timer/Counters with compare modes, Internal and External Interrupts, a serial programmable USART, a byte oriented Two-wire Serial Interface, an 8-channel, 10-bit ADC with optional differential input stage with programmable gain (TQFP package only), a programmable Watchdog Timer with Internal Oscillator, an SPI serial port, and six software selectable power saving modes

**Solenoid valve:** The Kidde Electric Gas Valve is used on systems protecting gas-fueled equipment (e.g., appliances). The Kidde valve uses an electrically operated solenoid (120V, 60 Hz), which holds the valve in the open position.

## Sensor

**LM35:** is a precision IC temperature sensor with its output proportional to the temperature (in zero ). The sensor circuitry is sealed and therefore it is not subjected to oxidation and other processes. With LM35,

temperature can be measured more accurately than with a thermistor. It also possess low self heating and does not cause more than 0.1 oC temperature rise in still air.

**Gas sensor:** The MQ-5 gas sensor is made up of SnO<sub>2</sub> which has lower conductivity in clean air. A simple electro-circuit is used here which is used to convert the changing conductivity into corresponding output signal of gas concentration. Both Methane and Propane can be detected easily by MQ-5 sensor because it has high sensitivity towards Methane, Propane and Butane. It is a low cost sensor suitable for different application.

## IV SYSTEM FUNCTIONALITY

The Desktop and web application is being developed in VB.net and ASP.net framework where a desktop application gives overall status of home appliances and can be control by one click .and web application provide the web page where live video of particular home can be viewed .the web page can provide a user account.

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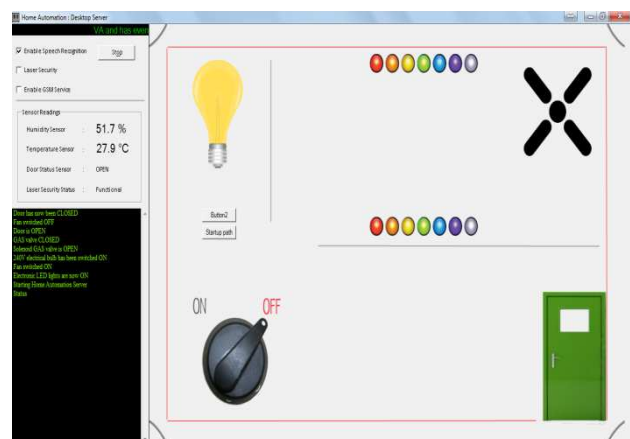


Fig1:Desktop application



Fig2: web application1

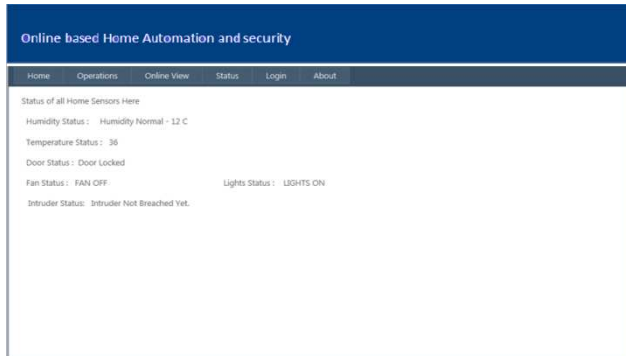


Fig3: web application2

The desktop and web application is integrated with ATmega16 microcontroller and overall operation of home automation is being performed.

## V CONCLUSION

The home automation which is being developed previously were not upto mark where only appliances control i.e ON or OFF were given. This paper result shows the appliances automation and security with Overall control of home appliances using user friendly GUI and speech recognition application which is feature to attract the use of home automation using the .net framework.

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