HI_TECH HOME

1. CHINMAY JAIN   2. PALLAV JAIN   3. MUKESH KUMAR (LET.)

4. DR. PANKAJ KUMAR GOSWAMI   5. RAHUL VISHNOI

1,2, 3 UG Student, Department of ece, FOECS , Teerthanker Mahaveer University, Moradabad, UP, India.

4 & 5 Assistant Professor, Department of Electrical Engineering, FOECS, Teerthanker Mahaveer University, Moradabad, UP, India.

ABSTRACT: "**Hi-Tech Home** is becoming popular due to its numerous benefits. Home automation refers to the control of home appliances and domestic features by local networking or by remote control. Artificial Intelligence provides us the framework to go real-time decision and automation for Internet of Things (IoT).The work deals with discussion about different intelligent home automation systems and technologies from a various features standpoint. The work focuses on concept of home automation where the monitoring and control operations are facilitating through smart devices installed in residential buildings. Home automation systems and technologies considered in review with central controller based (Arduino or Raspberry pi), web based, email based, Bluetooth-based, mobile-based, SMS based, cloud-based and the Internet with performance The work is concluded by giving future directions home automation Security Research."

KEYWORDS: Home-Automation, Intelligence, Microcontroller, Sensor System, User-friendly Interface

1. INTRODUCTION

The concept of HI-TECH home is basically automation. Automation is a technique, method, or system of operating or controlling a process by electronic devices with reducing human involvement to a minimum. The fundamental of building an automation system for an office or home is increasing day-by-day with numerous benefits. Industrialist and researchers are working to build efficient and affordability automatic systems to monitor and control different machines like lights, fans, AC based on the requirement. Automation makes not only an efficient but also an economical use of the electricity and water and reduces much of the wastage. IOT grant to people and things to be connected Any-time, anyplace, with anyone, ideally using any network and any service. Automation is another important application of IOT technologies. It is the monitoring of the energy consumption and the Controlling the environment in buildings, schools,

offices and museums by using different types of sensors and actuators that control lights, temperature, and humidity.

2 HOME AUTOMATION

2.1 User interface - As a monitor, computer, or Phone, for example that can give orders to control System.

2.2 Mode of Transmission- Wired connections (example Ethernet) or Wireless (radio waves, infrared, Bluetooth, GSM) etc.

2.3 Central Controller-   A central controller based The HI-TECH Home known as Home automation, with the use of new technology, to make the domestic activities more convenient, comfortable, secure and economical. The home automation system includes main components which are:

Home security system can be implemented by combining many homes into a security network with a control node dedicated to each locality depending on the number of users. There are few central or chief control nodes with high processing power which controls these nodes.

2.4 Electronic devices- A light, an AC or a heater, which is compatible with the transmission mode, and connected to the Central control system.

3 FEATURES OF HOME AUTOMATION SYSTEM

In recent years, wireless systems like Remote Control have become more popular in home networking. Also in automation systems, the use of Wireless technologies provide several advantages that could not be achieved with the use of a wired network only.

3.1 Reduced Installation costs
Installation costs are significantly reduced since no cabling is necessary.
3.2 Internet Connectivity
Control devices from anywhere in the world with use mobile phones to control HI-TECH Home.
3.3 Scalable and Expandable
With the Compare of Wireless network is especially useful when, due to New or changed requirements, an extension of the network is necessary.
3.4 Security
Easily add devices to create an integrated smart home security system and built-in security ensures integrity of smart home.

4 CHALLENGES OF HI-TECH HOME
These include high manufacturing costs, high development costs, high installation costs, additional service and support costs, lack of home automation standards, consumer unfamiliarity with technology, and complex user interfaces. With the advancement of time, rapid development

in technology and processing power which leads to a considerable reduction in device cost and size. All of these factors have contributed to the popularity of electronic devices today, so people are no longer confused or unsure about the use of the computer, mobiles, or tablets. Moreover, a lot of home automation protocols, communication and interface standards.

4.1 From a Homeowner's Point of View

1. There is a huge difference between what user thinks is the implementation of access control and the access control and security measures that are actually implemented.

2. Along with home security system, there can be more devices connected to a home network like mobile phones which go with other user and connects to external other networks.

3. An attacker can compromise home automation system by using these devices as a gateway to home network when these devices get connected to home network because user are careless in this case.

4. Most of the times people are unaware, misinformed or careless about various security risks while choosing home automation system due to the money issue.

4.2 From a Security Engineer's Point of View

1. Unlike in companies, one can't enforce policies or security procedures that affect the convenience of people at home or their guests.

2. People are careless about even simple security policies.

3. Home may consist of people of different age groups e.g. Senior citizens which are not cable of understanding the technical aspect of the security system is more vulnerable to social engineering. 4. An attacker who hacks a home automation network can cause a wide range of damage, including theft, vandalism, emotional harm, permanent damage to electronic devices, loss of reputation, financial damages, blackmail, environmental damages, physical harm to a home's inhabitants, granting unauthorized access to anyone.

5. The mixed ownership of devices at home and guests with varying technical knowledge and different intentions compounds security issues at home.

5   FEATURES

5.1 Bluetooth-based Home Automation System

We are talks about providing an electronics user manual on the phone using Bluetooth and Internet. Issues of using Bluetooth

1. Bluetooth has a maximum communication range of 100m in ideal conditions. More may be needed in a home environment.

2. Bluetooth communication has comparatively high power consumption, so the batteries of devices need to be frequently recharged or replaced.

3. Bluetooth technology has advanced and improved to Bluetooth Low Energy (BTLE), which provides the same range of communication. However, it has serious security concerns such as eavesdropping and weak encryption as discussed by M. Ryan .

4. Bluetooth communication should only be used on occasions where there is a need for quick short-lived network communication with little concern for security.

Bluetooth looks like an attractive communication technology for creating smart homes. Bluetooth is cheap, easy, and quick to set up. People are already familiar with the technology. The hardware required for establishing Bluetooth communication is readily available and the technology also provides the necessary bandwidth for the operation.

5.2 GSM or Mobile-based Home Automation System

Mobile based home automation is attractive to researchers because of the popularity of mobile phones and GSM technology. We mainly consider three options for communication in GSM, namely SMS-based home automation; GPRS based HI- HOME automation, and Dual Tone Multi Frequency (DTMF)-based home automation.[2].
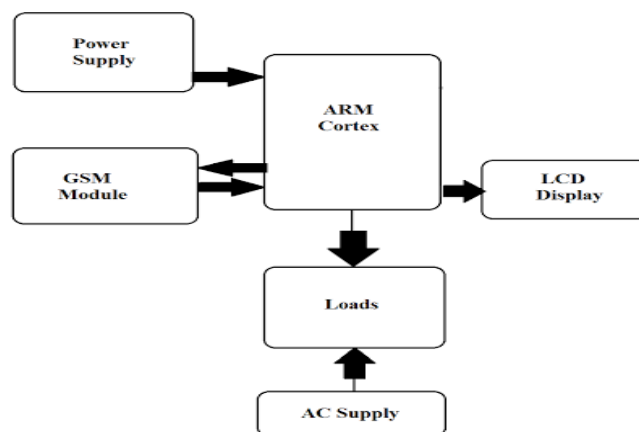
Security concerns about SMS-based HI-TECH Home security systems:

1. The 4 digit security passkey n then itself, proposes a security. An attacker could wait outside the home and peep through the window to learn the passkey. One can't expect the owner to be careful every time he or she enters the passkey. The user punches in the passkey routinely, so the probability of the user being careless is high.

2. The passkey used in the work and it's different for each individual at home, which improves the odds of hacking the keypad.

3. Informing the homeowner about an intrusion at home through an SMS message is never a good practice. Users may not frequently check their phones for SMS messages, or may not be near enough to the phone to hear a message received tone, so they could easily miss the intrusion alert.

5.3   Internet-based Home Automation System

Internet or IP protocol-based communication in home automation systems is always a popular choice among researchers. The Internet is easily scalable, flexible when it comes to access and use, and very popular as a communication method in today's world, so the hardware and the network required for access is readily available, offers high bandwidth and very low communication cost, and devices can connect to and disconnect from the network easily.

These are some of the features that make the Internet such an attractive choice for researchers. Utilizing the Internet as a means to access and control the home seems to be the next logical step forward for home automation systems. From an end user's point of view, using the Internet to access their home is easy, convenient, cheap, flexible, and offers no complication of an added technology to learn. User interface devices like laptops, smart phones, PCs, and tablets are easily available in the market, and these devices are already a part of people's daily lives. So, incorporating home automation into these already-popular user devices seems to be the natural progression. In most Internet-based automation systems, a username and password seem to be the only authentication method used.

CONCLUSION

Based on surveyed study the comparison of HI-TECH Home automation systems is presented. Microcontroller, user interface, a communication interface and their performance factor are compared. There are a number of do-it-yourself (DIY) platforms available that allow to create Home Automation system quickly and easily with low cost and high performance e.g. Raspberry pi, Arduino, other microcontrollers, etc. In this review explained different home automation system e.g. Web based, email based, Bluetooth-based, mobile-based, SMS based,. In future home automation will more smart and fast. It would be extended to the large-scale environment such as colleges, offices and factories etc.

REFERENCES

1. M. Danaher, D. Nguyen, "Mobile Home Security with GPRS," in proceedings of the 8th International Symposium for Information Science, Oct. 2002.

2. Kenneth J. Ayala, (1996), The 8051 Micro-Controller Architecture, Programming and Applications, India.

3. Muhammad Ali Mazidi, Janice Gillispie Mazidi, (1999), The 8051 Micro-Controller and Embedded Systems, Prentice Hall, USA.

4. A. Alheraish, "Design and Implementation of Home Automation System," IEEE Transactions on Consumer Electronics.

5. A. ElShafee, K. A. Hamed, "Design and Implementation of a WiFi Based home automation System," World Academy of Science, Engineering and Technology, vol. 6, 2012.