



## Home Automation Technique- (A Review)

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**Abstract --** *This paper describes an investigation into the usefulness for remote controlled operation of home automation systems. It emphasizes problems with their implementation, discusses possible solutions through various network technologies and indicates how to optimize the use of such systems. The home is an eternal, heterogeneous, distributed computing environment which certainly requires a careful study before developing any suitable Home Automation System (HAS) that will accomplish its requirements. Nevertheless the latest attempts at introducing Home Automation Systems in actual homes for all kinds of users are starting to be successful thanks to the continuous standardization process that is lowering the prices and making devices more useful and easier to use for the end user. Even so several important issues are always to be handled strictly before developing and installing a Home Automation System; factors like security, reliability, usefulness, robustness and price are critical to determine if the final product will accomplish the expected requirements.*

**Keywords—***Domotics, Home Automation System, Home networks, Standards, User-friendly interface.*

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### I. INTRODUCTION

Today the technological world's main focus is to automate every possible thing to take advantage in providing ease in life. In the most of the well developed countries home automation is very famous and well adopted because it has several many benefits like it saves electricity and provides security. The concept of "automation" has existed for many years. It began with a student connecting two electric wires to the hands of an alarm clock in order to close a circuit of a battery and light bulb. Later, companies developed automated systems of their own to control alarms, sensors, actuators and video cameras and, in so doing, created the first automated buildings. At the beginning automated devices were independent or, sometime, grouped in small independent systems.

The term "intelligent home" followed. Due to the obvious advantages of these systems, their influence on the conventional home was predictable and finally, in 1988, the term domotics was coined. "Domotics is the application of computer and robot technologies to domestic appliances.

In addition, a strong reason why of HASs are becoming popular is because they are plenty of attractive features that can easily lure companies to enter quickly this emerging market, also they represent a great research opportunity in creating new fields in engineering, architecture and computing.

### II. USE OF REMOTE CONTROL SYSTEM

Wireless technologies represent a rapidly emerging area of growth and importance for providing ever-present access to the network; WLANs based on the IEEE 802.11 standard are being implemented constantly in the houses and Broadband wireless (BW) is also an emerging wireless technology which is competing with Digital Subscriber Line (DSL). According to this, it makes sense that the logical direction about managing HASs in the near future is going to be by means of a remote control. But wireless technologies in domotics should be implemented carefully.

#### (A) HOME NETWORK REMOTE CONTROLLING BENEFITS

The increasing ubiquity of heterogeneous computing devices such as laptop computers, palms, mobiles etc. shows that users prefer a ubiquitous access of a system rather than to be uncomfortably forced to go physically to the nearest control point. Remote control saves time and everybody is aware of this, it also provides increased security and flexibility. For example, if the user receives a SMS saying that there was an intrusion, he/she can connect to the internet and watch the video cameras inside the house to see what happens, another example could be the possibility to turn on the heaters from the distance using a mobile, laptop or PDA so as soon as the user reaches the house it will be hot already, this could be really useful especially in cold countries. As a matter of fact security will always be a main priority in all families, and prevention is better than cure. By receiving alerts in a portable device user is informed of all possible issues occurring in the house and it gives the possibility to deal with it using different ways of control like instant messaging, since many users are already familiar with the concepts and user interfaces of instant messaging [4]. Many computers and mobile devices also already have instant messaging clients installed (Aurell, 2005). Good scalability properties, liberty of location or geographical distance, and high flexibility due to the different existing protocols make remote-controlling HASs suitable for most user needs.

### III. REMOTE CONTROLLED HOME AUTOMATION SYSTEM

Auto Electric House is a house whose electricity is controlled and security mechanism by computer. The whole project is consists of following different software and hardware components .i.e., House with electricity, Security system, Bit controller card, Adapter (12V DC), Programmed Software.[5]

#### A) Electric House:

The prototype house has been constructed with wood and glass. The whole house is consists of six rooms and one lobby. The electricity has been provided to all of the rooms and the lobby of the house. Only one computer is controlling the whole electricity of the house. The house consists of three layers .i.e., *External Layer, Internal Layer and Deep Internal Layer*.

##### i. External Layer:

This is the outer shown part of the house covering the house from upside like roof of the house. This part of the house has made of wood and glass. Only the security system has been planted at this layer. The main function of relay is to switch between two terminals. The connection of each room is connected to each relay. Operating voltage of the relay is 12 volts (DC). Maximum switching current that can be passed through relay can be of 220 volts 5A (AC). Magnetic field is produced when current is passed through the coil of the relay. During forward biasing relay connects with terminal 1 and in case of reverse biasing relay connects to the terminal 2. This reverse and forward biasing is handled with the help of a transistor.

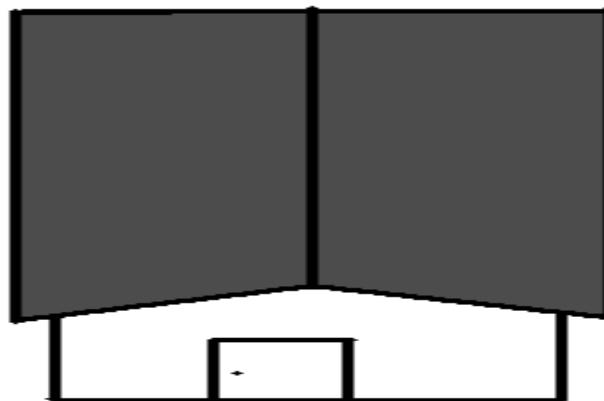


Fig.1: External Layer

##### ii. Internal Layer:

This is the middle layer of the house because this layer is placed between the other two layers of the house (Deep internal and external layer). Basically this layer carrying the internal structure of the house (rooms, lobby and some other parts). The electric components, which are automatically controlled, are fixed in this part of the house.

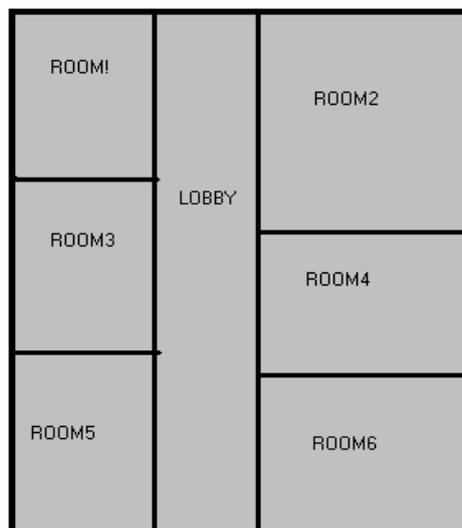


Fig.2: Internal layer

##### iii. Deep Internal Layer:

This is the most important layer of the house because this contains the main hardware designed and made to control the electricity of house and provide complete security system. (See Figure 3)

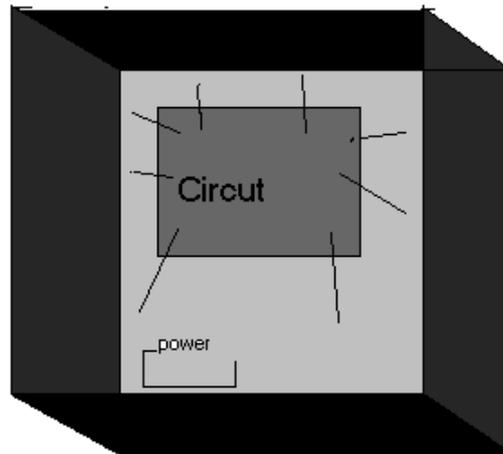


Fig.3:Deep Internal Layer

**A. Security System:**

This is an important feature of the auto electric house. The security has been implemented on the external layer of the house and its function is to alert owner if someone disturbs the security. The security system is infrared based, when ever some disturbance occurs then it reports input to the controlling computer to perform needed actions.

**B. Bit Controller Card:**

Bit controller card operates at 12V (DC) provided by the adapter. Controller card is connected to the computer using parallel port cable. The main circuit of bit controller card is based upon 8 sub circuits and following components have been used in the circuit.

1. Relays
2. Transistors
3. Crystals Diodes
4. Resistances
5. Capacitor
6. Bridge
7. Connector
8. Parallel port

It is clearly necessary to have an organized and defined structure for HASs (Cortes, 2002). Since their creation normally involves different areas of electronics, architecture and computing, there are many different ways to develop solutions and not all of them can be

applied to all users. This makes them difficult to implement due to the high impact that they might have on the everyday user

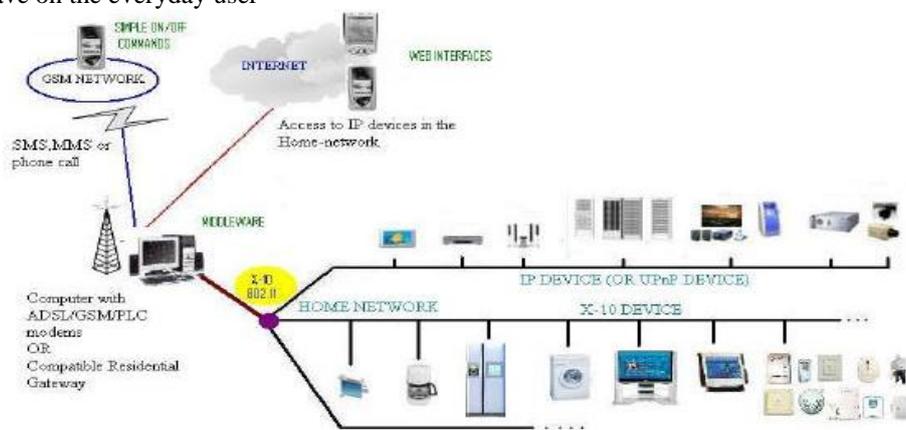


Fig.4:HAS

**IV. BENEFITS AND ISSUES**

Even with all issues related to remote-controlled HASs it seems that the benefits are just good enough to continue advancing in this field, also just recently, organizations have been formed to ensure network and device interoperability.

For example, the adoption of the 802.11b standard has made wireless data networks one of the hottest newcomers in the current wireless market[4]. As a result, in one hand remote-controlled HASs represent in Domotics a great opportunity to improve human computer interaction thanks to its ubiquitous access, but in the other hand they represent one of the most challenging environments due to involved security issues and relative complexity of portable devices.

However, these new technologies are still in their early stages with a lack of robust standards creating compatibility issues affecting their reliability. Another problem is that these systems are not always fully accepted by final users, especially the old and disabled – arguably the ones that need it the most. It is the goal of researchers to find out how to introduce home automation into our lives so as to only affect us positively. The four major issues being:

1. Interoperability
2. Scalability
3. Security
4. limited services.

### V. BACKUP GSM REMOTE CONTROL

The Global System for Mobile Communications (GSM) is a digital standard wireless technology GSM is the most widely used wireless technology in the world with one billion customers globally, which represents 72% of all wireless customers. GSM has a high presence among users (almost everybody has a mobile) raising the probability of the remote controlled

HAS to be accessible, furthermore by programming the GSM modem using AT/AT+ commands it provides another security layer (modem will respond only to specific mobiles) and certain robustness.

At this backup level, the interaction with the user is very simple; the bilateral communication is reduced to the minimum, only representing emergency processes. Eventually, the remote-controlled HAS will send alerts to the user's mobile informing about unusual state changes in the sensors within the building, afterwards user is able to activate/deactivate some automated devices required to solve the issue either by dials or messaging or, in the usual case, using a web interface, in any case the user will have always two possible accesses in case that one fails.

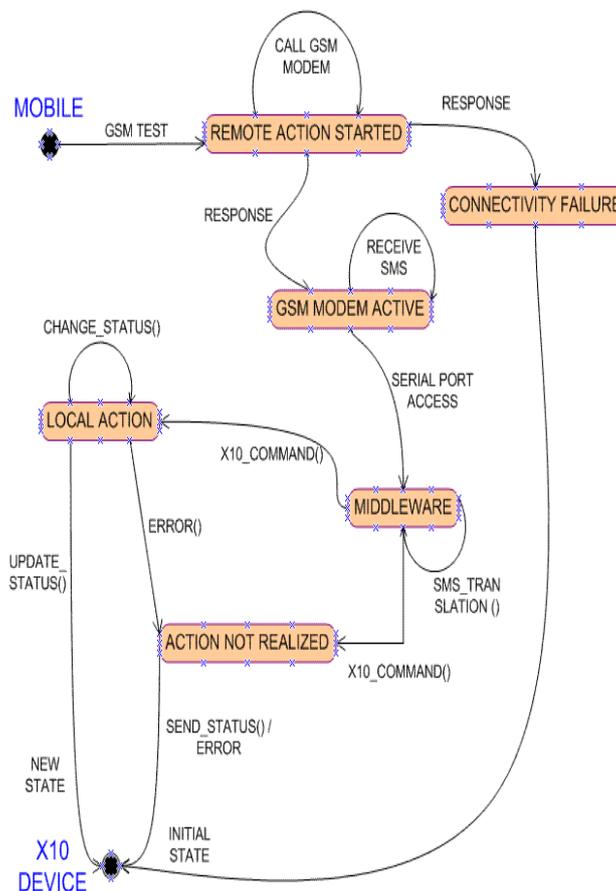


Fig.5—GSM Backup Control

### VI. BENEFITS AND SCOPE

There are already E-home standards settling up in Europe, the example is the European Installation Bus (EIB) that is the world's leading system for "intelligent" electrical installation networking . Not to forget That UPnP providing total compatibility with XML and IP. I agree with Simon Aurell (2005) that the most likely way of interfacing with devices in the future will be IP; it is more flexible, scalable and compatible. The biggest issue will be probably to make it usable and accessible to all kinds of users.

Since this is a new field of investigation, the results of the project are likely to be worthy of further analysis. The completion of a whole cycle of control between a remote device and the building will be critical for the success of the research; once control is achieved a meticulous study about how users and the system interact has to be done. It is important to clarify that this research does not exclude local control of HASs - it is simply focused on remote control as an important field for HASs in the future[6]. To conclude, this research should help other researchers to achieve their goals with their future HAS projects and it will contribute positively to the E-Home community. Perhaps one of the greatest benefits of an automated system in your home is automated door locks. How often have you left for work in the morning only to realize that you forgot to lock your front door? Through an automated system, you can lock your doors with the tap of your finger. This quickly eases your mind, so you can focus on your day's work rather than who may or may not be entering your home. This is also a great benefit for you if you have to leave to work before your children leave for school. Often, children run out the door to catch the bus and forgot to lock the door. You can easily have control of the situation by locking the door from your office each day. The fact that you can be alerted each time someone enters your home also allows you to monitor who is entering your home at all times, even when you are not there.

## VII. CONCLUSION

In this paper it has been briefly discussed the importance of home automation system then provided the brief information about a PCB circuit construction to control house's electricity and provide infra red based security system connected and controlled by a computer via parallel port to introduce an automated environment in all homes. As mentioned earlier, a home automation system saves money. The most beneficial impact the system will have is on your monthly utility bill. No longer will you be spending money for household appliances left on in your family's absence. You will also save on gas costs, as you will never need to stop by the house in order to turn something off or on[7]. This is certainly convenient. You will have complete control to make sure costs are low without exerting any additional effort

Home Automation is undeniably a resource which can make a home environment automated. People can control their electrical devices via these Home Automation devices and set up the controlling actions in the computer. We think this product have high potential for marketing in the future. At the moment the components are a bit to high to be able to produce these devices for a interesting price

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