

A Survey on Home Automation using Cloud Network and Mobile Devices

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Abstract: Today, we are entering post-PC era where mobile devices (e.g. Smartphone's, Smartphone's and Handheld tablets) are handling daily tasks that traditional desktop and laptop computers once handled. Several reports show that personal computers are no longer on the leading edge of computing and the use of mobile devices are quickly taking over. Accompanying the shift from PCs to multi-touch mobile devices is the use and implementation of Cloud Networking. With the availability of products which integrate mobile devices and cloud networking rapidly increasing, many users can see how new technology can impact their everyday lives. In this paper we have developed a Home Automation system that employs the integration of multi-touch mobile devices, cloud networking, wireless communication, and power-line communication to provide the user with remote control of various lights and appliances within their home. This system uses a consolidation of a mobile phone application, handheld wireless remote, and PC based program to provide a means of user interface to the consumer. The home automation system differs from other systems by allowing the user to operate the system without the dependency of a mobile carrier or Internet connection via the in-home wireless remote.

Keywords :- Mobile cloud computing, mobile services, Java.

I. INTRODUCTION

Modern advances in electronics and communications Technologies have lead to the miniaturization and improvement of the performance of computers, sensors and networking. These changes have given rise to the development of several home automation technologies and systems. According to, home automation can be useful to those who need to Access home appliances while away from their home and can incredibly improve the lives of the disabled. Many of the home automation systems that are commercially available can be separated into two categories: locally controlled systems and remotely controlled systems. Locally controlled systems use an in-home controller to achieve home automation. This allows users complete use of their automation system from within their home via a stationary or wireless interface. Remotely controlled systems use an Internet connection or integration with an existing home security system to allow the user completes control of their system from their mobile device, personal computer, or via telephone from their home security provider.

There are a number of issues involved when designing a home automation system. Piyare and Tazil [4] discussed that the system should be scalable so that new devices can easily be integrated into it. It should also provide a user- friendly interface on the host side, so that the devices can be easily setup, monitored, and controlled. Furthermore the overall system should be swift enough to realize the true power of wireless technology. Lastly the system should be cost Effective in order to justify its application in home Automation. To minimize the shortcomings of each system and to overcome the design issues previously mentioned, this project integrates locally and remotely controlled systems with the use of Cloud data network.

This allows the system to operate without the dependence of a mobile provider, allows the system to be used with various mobile phone platforms, and allows the system to operate locally when phone or computer access is not available. Cloud networking and data infrastructure allow individuals to monitor, manage, and control their personal data points through the Internet. Each data stream is given a unique feed identification number to differentiate itself from all other data Streams on the Network. This paper will discuss the Development of a home automation system, as illustrated in .In home control is achieved via a hand held remote which uses Zigbee wireless communication to the in home controller which is integrated with the cloud network via an internet connection.

II. PREVIOUS STUDY

Many of the home automation systems that are commercially available can be separated into two categories: locally controlled systems and remotely controlled systems. Locally controlled systems use an in-home controller to achieve home automation. This allows users complete use of their automation system from within their home via a stationary or wireless interface. Remotely controlled systems use an Internet connection or integration with an existing home security system to allow the user complete control of their system from their mobile device, personal computer, or via telephone from their home security provider.

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The healthcare industry is in a period of accelerating change that requires continual innovation. The chronic disease epidemic, changing population demographics and advancements in medical technologies are key contributors to escalating costs. All stakeholders expect more value for their money. And, patients are beginning to play greater roles in managing their care. Driven by economics, emerging care and business models aligned with personal values and well-being are signaling a major shift in how healthcare organizations will compete and operate in the years ahead. A recent CEO Study conducted by IBM revealed that only 34 percent of healthcare provider CEOs are focused on simplifying operations to manage complexity more effectively.

Similarly, only 55 percent of healthcare payer CEOs believe their organizations are ready for the impending complexity. Yet most recognize that there is a new environment in which they have to operate. 2 Cloud computing is a new IT approach that offers new economic benefits, rapid deployment of services and tight IT alignment with business goals. This paper reviews the potential for cloud computing in the healthcare industry and makes specific recommendations for how the healthcare industry can take advantage of this technology to thrive. In healthcare, the pace of change is increasing, along with the complexity of delivering higher quality care for significantly fewer dollars per patient. Hospitals and physicians are looking for strategies to increase business flexibility, while demonstrating greater healthcare value.

To do so, a transformation from institution-centered, data-poor systems to patient-centered, information-rich health systems is needed. A flexible and scalable approach to applications and infrastructure can help healthcare organizations support new business approaches and seamless patient experiences. Emerging care delivery and business processes will drive transaction volumes and complex analytics-driven workloads to new levels never envisioned by healthcare organizations. These drivers require a larger IT footprint to enable new capabilities, yet growing IT complexity threatens to hold organizations back.

III. SYSTEM DESIGN

Pachube is the networking cloud used in this design. Each data stream is classified by a feed identification number and secured by a forty-seven character password. Pachube treats each unit in the house as a data point. These data points are manipulated to control the unit inside the home automation system. When a unit is turned on, a value of one is given to that action, and zero for turning off action. When a unit is brightened or dimmed a value between the range of zero and nine is given to that action. After each unit is set to its desired action, the values are placed in a networking package and sent to the cloud.

Pachube has an API (Application Programming Interface) editor that allows the user to create and design user interfaces and graphs for the user's need. The graphical interface can be designed and created through Pachube's API. For example, switches and knobs can be used on the applications interface to simulate on/off and dimming respectively for the units in the Home Automation System, as shown in Fig. 2b. The API also allows the programmer to dictate the color, pixel dimension, title, axis, and time span of the graph. Whenever the user chooses the option to monitor a specific unit in the system, the software is programmed to extract the data points of that corresponding unit and plot a graph of it over the options of the past twenty-four hours or thirty days

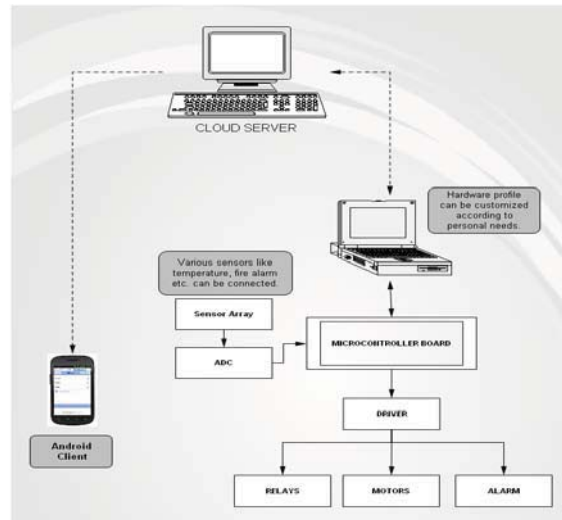


Figure 1: Block diagram of home cloud networking.

To access Pachube outside the home, users can use either the iPad application or C# based PC application. On the iPad app, UIWebView class is mainly used to provide a simple way to display HTML content from Pachube inside an iOS application. Home Automation is the residential extension of "building automation". It is automation of the home, housework or household activity. Home automation may include centralized control of lighting, heating, ventilation and air conditioning, appliances, and other systems, to provide improved convenience, comfort, energy efficiency and security.

A home automation system integrates electrical devices in a house with each other. The techniques which are going to use in home automation include those in building automation as well as the control of domestic activities, such as TV, fan, electric tubes, refrigerator and washing machine.

The system allows the user to control appliances and lights in their home from an android and PC from anywhere in the world through an internet connection. It also allows the user to control their units within their home from a wireless remote. The wireless remote has primary control over the system; therefore if the remote is active neither the android nor PC will be able to control the units in the home. This design prevents from the android, PC, and wireless remote all trying to control the system at the same time.

IV. RESULTS

The system allows the user to control appliances and lights in their home from a smart phones and PC from anywhere in the world through an internet connection. It also allows the user to control their units within their home from a wireless remote. The wireless remote has primary control over the system; therefore if the remote is active neither the Smartphone nor PC will be able to control the units in the home. This design prevents from the Smartphone, PC, and wireless remote all trying to control the system at the same time

V. SCOPE FOR FUTURE WORK

Using this system as framework, the system can be expanded to include various other options which could include home security feature such as open-door and motion detection, energy monitoring, or weather stations.

VI. CONCLUSION

By integrating multi-touch mobile devices, cloud networking, wireless communication, and power-line communication, we were able to design and build a fully functional home automation system. It allows the user to control various appliances and lights within their home from any location in the world through Pachube cloud network using 1) mobile devices, 2) PCs, or 3) in-home remote controller. Mobile cloud computing is one of mobile technology trends in the future since it combines the advantages of both mobile computing and cloud

computing, thereby providing optimal services for mobile users. According to a recent study by ABI Research, a New York-based firm, more than 240 million business will use cloud services through mobile devices by 2015.

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