

GREEN CAMPUS WITH IOT-THE APPLICATION IN LAB MANAGEMENT

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Abstract: The Internet of things i.e. IOT is the future technology that is decide how to interact with day to day device and make them more efficiently. Because of the increase in population the problems about the resources are created rapidly. The proposition has been promote on campus of educational in situation as well. Smart campus is a trendy application in the paradigm of the IoT. This research adopts the concept of the “Internet of Things” to construct a green campus environment which will realize the idea of energy saving. The architecture of the construction of green campus established and three application systems have been developed as well. The efforts of this work allow the campus to manage the computer labs and the air conditioners more efficiently. The sensor network will save more energy since data are reported periodically and the analysis will be carried out in time to locate the problems.

Keywords: internet of things, RFID, green campus, Temperature sensor.

1.INTRODUCTION

THE advances of emerging technologies have broadened the meaning as well as the applications of the Internet. With smart connectivity, physical objects are networked and will gain the ability to communicate with each other. The vision of “The Internet of Things (IoT)” promises to enhance the capabilities of objects and forms a smart environment so that people can benefit from the IoT revolution . The IoT applications cover the building of smart cities, the set up of smart environment, the provision of smart public services, the plan of eHealth, and the building of smart home/office, etc.Green campus aims to make environmental awareness and action an intrinsic part of the life and ethos of a college.The Green campus initiative mirrors the principles of green-schools and endeavours to extend learning beyond the lecture theater to develop responsible attitudes and commitement to the environment, both a home and in the wider community.As the global population grows, the resources on earth are depleted quickly. In order to have a sustainable earth, governments around the world put a lot of efforts to advocate the importance of the reduction of carbon production as well as to emphasize the benefits of reducing the consumption of

energy. The concept of constructing a “Smart campus” implies that the institution will adopt advanced ICTs (Information Communication Technologies) to automatically monitor and control every facility on campus. The benefits gained from building a smart campus include that the use of all facilities becomes more efficient and the energy consumed is minimized. Such efforts are also recognized as constructing a “Green campus”.

2 The Internet of Things

The “Internet-of-things”is the future technology which is used to decide how to interact with day to day device and make them more efficiently. Internet –of-things (IOT)systems are envisioned to revolutionize the telecommunication paradigm by allowing direct integration between the physical world and machine-based systems.IOT systems allow everything to be connected, remotely accesed, and sensed and collaboratively communicate over the internet. concept and the realization of the “Internet of Things” make the world truly ubiquitous since the IoT radically changes the view of the “Internet” by embracing every physical object into network . The term “Internet of Things” has become very popular in recent years. There are books to teach or to discuss various subjects about the IoT. International conferences open up sessions for scholars and specialists to exchange their ideas, opinions and experiences regarding the development or the applications of the IoTs. And finally in 2009, even the EU Commission realized the importance of the revolution of the Internet and initiated an IoT action plan . In , it is suggested that an IoT must be internet-oriented (middleware), things oriented (sensors) and semantic oriented (knowledge). Based on the assertions, proposed that the architecture of an IoT actually contains three segments which are the hardware segment, the middleware segment and the presentation segment. The hardware segment mainly refers to the connection of sensors or any embedded communication hardware. The middleware segment usually refers to cloud environment which is responsible for data storage, computation and data analytics. The presentation segment, on the other hand, visualizes the result of data analytics or interprets the data in an easy and understandable format. Moreover, an IoT must possess the capabilities of communication and cooperation, addressability, identification, sensing,

actuation, embedded information processing, localization and user interfaces . At the hardware segment, wireless sensor network is expected to be a key technology for various IoT applications such as home automation , and energy saving . The sensor devices in the wireless sensor network work as the communicate node and will communicate to other devices wirelessly . The sensor device also carries out its designated duty to collect data and send data to data center. Therefore, communication and measurement are the two major functions of a wireless sensor network . ZigBee is the name of a standard that specifies the application layer of a wireless network in a small area with a low communication rate . Previous researches and projects have shown that ZigBee sensor networks are suitable for applications in many different areas.

3 LITERATURES REVIEW

Scholars and experts have agreed that the knowledge of protecting the earth should be cultivated by educations. Universities should provide leadership for broader society and institutions of higher learning have a special responsibility to address the continuing environmental crisis. The author specifically points out that one of the greatest opportunity and ability to conserve energy is through facilities management on campus. Educational institutions across the world, especially the higher education, have recognized that they are in a unique position to prevent the crisis from getting worse. Not only are the faculties realizing that they possess the intellectual capacity to address these issues, but also the institutions are putting a lot of efforts in the integration of all resources and effectively adopting new technologies to their missions to create a green environment. There are a number of well known “Green Campus” examples. For instance, the green campuses of the University of Pennsylvania, Boston University and the University of Chicago in the United States; Macquarie University in Australia; University of Copenhagen in Denmark and Queen's University in Canada, etc.

4. BLOCK DIAGRAM

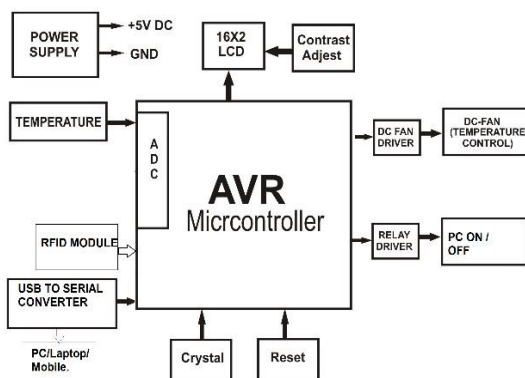


Fig:Block diagram of system

4.1 Block Diagram Description

In the system AVR microcontroller is used. For the IOT pc/laptop/mobile this devices are used. These devices are used to see the result. The temperature sensor is used to measure the temperature. RFID i.e. radio frequency identification is used to scan the ID, seat number of students. RFID will scan all data of student. USB is used to serial converter. DC fan driver is used to ON or OFF fan. The Atmega16 from AVR family is a low-power CMOS (Complementary MosFET), 8-bit controller based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega16 achieves throughputs approaching 1MIPS, 1MHz allowing the system designed to optimize power consumption Vs designer speed. The project consists of LM35 as the temperature sensor. The sensor output is analog . The analog signal is converted into digital using internal ADC. The data is processed and calibrated internally. The data is displayed on the 16x2 LCD. The set value be set in the microcontroller. When the value reaches the set point the FAN will be on.

Advantages

1. It is used for energy saving.
2. because IOT concept this system is more efficient.

4 CONCLUSIONS

This research adopts the concept of the “Internet of Things” to construct the green campus which will realize the idea of energy-saving. The objects of our work include the computers and air conditioners. RFIDs and the ZigBee device with temperature module are used to build up the wireless sensor network.

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