POWER WASTAGE DETECTION IN COMPUTER LAB USING WSN (XBEE PROTOCOL)

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ABSTRACT-*This paper describes the design,implementation, and testing of a wireless sensor and actuator network for monitoring the energy use in computer lab and remote attendance system based Radio Frequency Identification. The network includes energy measurement nodes and a central server, where the nodes read the energy use of connected appliance, and wirelessly report their readings to the central server for processing. The server displays the readings from these nodes via a user visual interface in real time. Through this system, users can easily understand their electricity usage patterns and adapt their behavior to reduce their energy consumption and costs. Moreover, users are able to remotely power on/off individual devices to actively control the power use of certain appliances. The system allows for inexpensive monitoring of home energy use and illustrates a practical way to control the energy consumption through user interaction and the system is also implemented for the automation of time and attendance using a new mode of barrier-free channel. With a simple setting, the attendance system is capable of recording real time attendance, counting attendance and attendance statistics analysis. Reports and charts will be provided for the top management to make decision, annual review, and planning on man power. The applied result of the system shows that it is simple and effective.*

Keywords – Hall Current Sensor, Radio Frequency Identification, Remote Desktop Connection, Terminal, Wireless Sensor Network, XBEE

INTRODUCTION

Personal computers (pc), including monitors, are one of the fastest- growing users of electricity in the United States. There is much advice about whether or not to turn your computer (and monitor) off when you're away from your desk. While turning computers and monitors off saves electricity and energy bills, some argue that excessive switching shortens there life, thus costing more in repairs and replacement than it saves in electricity. This fact sheet summarizes existing research and recommends under what circumstances personal computers (and monitors) are best turned off.

The electricity consumed by a desktop or minitower computer and monitor is significant: about 150 watts for a central processing unit (CPU) and a 17-inch color monitor (180 watts total for a CPU and 21-inch color monitor). Calculations based on the number of computer used by businesses and homes nationwide indicate significant environment impacts caused by computer energy use. Battery-powered laptops "The technological reasons for avoiding cycling of PCs probably no longer apply. There has been much controversy over whether to shut PCs off when they will be off for only a short time. This controversy has revolved around the effects of cycling on equipment lifetime and reliability [1] this is described by Dr.I.miteff.

A Strong case can be made for turning off the PC at night. The benefit of extending the use life of the PC can be important one. Many computers perform diagnostic test on start-up and never cycling the PC means that these diagnostic tests are not performed on regular basis." consume significantly less power. Nowadays many colleges use galaxy network technology as well as computer and Internet technology, give full play to various technical means of information network and make good use of various kinds of various education, scientific research and information resources, develop all kinds of application system and management system, realize network interaction management, and thus fully promote the development of higher education information. An intelligent classroom attendance checking system is introduced in this paper. As an important part of campus management system, this system can intelligently complete examining students' attendance. In addition, this system can automatically collect data information in real time, automatically analyze and process the collected data, report these data using visual interface, and thus intelligently implement SMS notification at the same time.

The traditional way is to assess, record and manage the attendance of students by roll call or magnetic card, which not only consumes the time, but also interferes with each other; while RFID student attendance application system is applied to manage the

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attendance of students using RFID technology, which not only completes the attendance checking conveniently and quickly, but also saves resources.

LITERATURY SURVEY

The table [1] illustrate the typical number of cycles needed to occur before the system breaks. According to the table, the disk drive of a regular computer is the equipment with the least tolerance for frequent on-off cycling, with an average of 20,000 cycles in its lifetime. Thus, an average computer could be turned on and off four times a day, five days a week for 20 years before the disk drive is likely to fail [4].

COMPONENTS	ALLOWABLE NUMBER OF POWER CYCLES IN LIFETIME
Monitor(regular)	At least 25,000
Monitor(Energy star)	At least 80,000
CPU chip	Varies with technology and packing
Printed circuit board	At least 90,000
Disk drive(laptop)	At least 40,000
Disk drive(regular)	At least 20,000
Disk drive(high capacity speed)	At least 3,000
Fan, power supply, etc.	At least 75,000

Table [1]: System Components Power cycles

"Leaving a computer on has little effects on its life or reliability. The computer just uses more energy than when it's off. Shutting off the computer between uses-whenever it's practical to do so-makes the most sense if you're concerned about saving energy"[5] the author Robert Gianni briefly tells about the case.

Assuming an average switching cycle number of five per working day, we expect (that) after more than 20 years, there would be a deterioration in the availability because some output transistors, components of the control and deflection electronics-impaired by the thermal cycles-would have to be conclusions, it seems to make sense and it seems to be appropriate to turn the PC monitor off every time it is not used for more than about 15 to 20 minutes [5].

If you want to save electricity, switch the monitor-a big power eater- off when the computer will be idle for more than an hour. Also, if your monitor is energy star-compliant, set it to go into sleep or standby mode after several inactive minutes. The only way to ensure that a monitor saves energy while it is turned on is by activating the power management features thus enabling the monitor to reduce power consumption when it is not in use [2] the Andrew fanara explains the situation .

In addition to attendance system, Radio frequency identification (RFID) also used in tracking the movement of student in campus[12]the author Abdul Kadar gives demo on this case. The system was developed to ease the university management team to monitor the presence of each student in the interest zone. SMOSA system contains two monitoring tasks; attendance system and tracking system using active RFID.

Another project on RFID related were in parking management system to manage and count the number of empty slots [13] this article s describes by zyedin Pala. Which the system calculates the in-out car at the gate. This could improve the number of empty parking is displayed at the gate.

In engineering applications, most of RFID application were used in robot navigation which the robot using RFID tag to recognize the location of the warehouse item to deliver the item to the designated space[14] and the work presented by utilized the modular and cost-effective navigation technique incorporating signals from RFID tags, RFID reader, and fuzzy logic controller. The RFID tags are placed at 3-dimensional positions in the robot's workspace. In such a way that the lines linking the projection points on the ground define "freeways" along which the robot is desired to navigate [16] this is proposed by the author milah.

METHODOLOGY

A. Hall Current Sensor

A current sensor is a device that detects electric current (AC or DC) in a wire, and generates a signal proportional to it. The generated signal could be analog voltage or current or even digital output. It can be then utilized to display the measured current in an ammeter or can be stored for further analysis in a data acquisition system or can be utilized for control purpose.

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B. *Radio Frequency Identification*

Radio-frequency identification (RFID) uses electromagnetic fields to automatically identify and track tags attached to objects. The tags contain electronically stored information. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source such as a battery and may operate at hundreds of meters from the RFID reader.

B. Wireless Sensor Network

Wireless sensor networks (WSN), sometimes called wireless sensor and actuator networks (WSAN), distributed autonomous sensors to monitor physical or environmental conditions, such as temperature, sound, pressure, etc. and to cooperatively pass their data through the network to a main location. The more modern networks are bi-directional, also enabling control of sensor activity. The development of wireless sensor networks was motivated by military applications such as battlefield surveillance; today such networks are used in many industrial and consumer applications, such as industrial process monitoring and control, machine health monitoring, and so on.

C. XBee

XBee is the brand name of a family of form factor compatible radio modules from Digi International. The first XBee radios were introduced under the MaxStream brand in 2005 and were based on the IEEE 802.15.4-2003 standard designed for point-to-point and star communications at over-the-air baud rates of 250 kbit/s. Two models were initially introduced — a lower cost 1 mWXBee and the higher power 100 mWXBee-PRO. Since the initial introduction, a number of new XBee radios have been introduced and all XBee are now marketed and sold under the Digi brand. The XBee radios can all be used with the minimum number of connections power (3.3 V), ground, data in and data out (UART), with other recommended lines being reset and Sleep.

D. Remote Desktop Connection

In computing, the term remote desktop refers to a software or operating system feature that allows a personal computer's desktop environment to be run remotely on one system (usually a PC, but the concept applies equally to a server), while being displayed on a separate client device. Remote desktop applications have varying features. Some allow attaching to an existing user's session (i.e., a running desktop) and "remote controlling", either displaying the remote control session or blanking the screen. Taking over a desktop remotely is a form of remote administration.

WORKING PROCESS

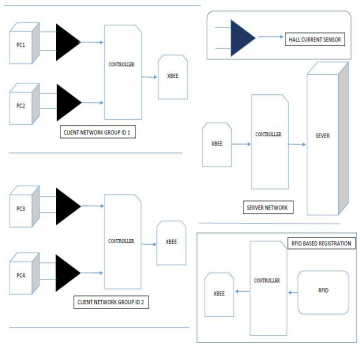

Fig 1.working of power wastage detection incomputer lab

Fig1 shows an application of this wireless energymonitoring system in a home scenario, where the measurement nodes are connected to major home appliances in different rooms, and the central server displays the energy consumption of these appliances on a computer screen. When we tested the remote power on/off control for standby power reduction, we first let the device go to the standby mode and calculated the standby threshold using power measurement samples during this period. In real-life application, the server software can be modified to detect the standby mode and set the threshold accordingly on the run. This can improve the ease of use of the system for non-technical users. In addition, the control method can also be time-based, where a user sets certain time frames that he/she wants to cut off the power of some devices. This would eliminate the standby power consumption in those nodes during those time frames.

The security and access control system is comprised of two phases: registration phase and

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recognition phase. In the registration phase, ten images of the hostel user are captured while issuing an RFID tag. These images are used to train a feed forward neural network with back propagation training algorithm and the converged weights are stored corresponding to a particular user. The recognition phase comes when the user wants to enter the hostel. At this point, after getting RFID user number, image of the user is captured and passed to the neural network for recognition. If a match is found, access is granted to the user. The user authenticity is checked at three places: hostel entrance, hostel exit and mess entrance. The entrance and exit modules use RFID and face recognition for identification while mess module use RFID with a password to grant permission. These modules communicate with computer system through a main controller. The main controller transmits the modules information to the computer system. The computer system after processing these interrupts issues commands to the modules through main controller. The data exchange between the main controller and computer system is through serial port while parallel port data and control lines are used for handshaking purposes.

RESULT

By monitoring the system power has been saved and WSN can monitor every system from a single place .After finding the system which is idle .the system administrator will save the file and shut down the system by windows remote desktop connection. Which saves all data in the system for processing as well as future use in software. These parameters data will be displayed on graphic user interfaced (GUI) window so that appropriate action can be taken from the GUI.

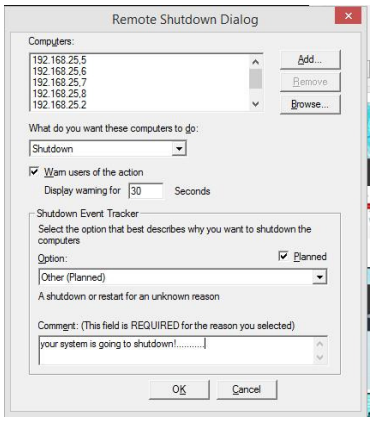

Fig 2. Result from GUI

CONCLUSION

As the personal computer industry has matured, the reliability of components has improved. If you're still really concerned about causing problems by turning your computer off when not in use .The systems are used in university, research center, institute and offices. In all these sector a single administrator cannot monitor. So by this prototype it is possible to interface and monitor 256*256 clients or system by a server administrator. By this project we can reduce the manual work and simultaneously, save the ongoing process in idle system and shut down.

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