

Energy Efficiency in Building Wireless Sensor Networks using Smart

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ABSTRACT

Since energy is the most fundamental force in human life and the loss and destruction of natural resources will lead to increased costs ;tried to use modern electronic methods , such as home automation networks , including wireless sensors are to manage at home , such as remote control , smart energy , security, smart buildings used or to the ability to meet and electrical switches are smart , make the users comfort , lower costs , BEMS needs of their users using the system energy savings are , in order to avoid wasting energy efficiency and move forward.

KEYWORDS: Energy Efficiency, Energy Management Panel, Wireless Sensor Network, Intelligent Network Design in Residential Buildings.

1. INTRODUCTION

Today, the buildings themselves are a kind of technology. They To adapt their technology and take advantage of it .As soon as the computer's ability to construct buildings Compromise, be smart. The first building Smart technology to provide a safe environment Comfort and energy use. The idea of building aIntelligent connection between access, lighting, securit , Monitor, manage and communicate remotely puts it ahead. Agent the ability to integrate systems so they can Exchange information among themselves.

Exchange of information between the System makes the resulting output dataThe final is to be done without causing any disturbance [1]. Introduces the concept of intelligent building a strong exchange without Perfect information among different parts of the building. At the result is a mix of a smart building innovations with taking advantage of modern technology makes it possible to allow Components and equipment to automatically control and performance. Increase efficiency and enable effective management of the tenants Under special circumstances and with the lowest cost providers; Azvqayy the inside and outside, and you know it happensIn the face of these events and to create an environment Desirable for users, most effective and best decisions in Especially take the same time, the system Employing the latest technology aimed at building a smartIt is in perfect condition with energyefficiency in Buildings created. While these systems of control Buildings and create a suitable

environment by providing services the same time, due to energy efficiency, increase the level of Effectiveness and efficiency of existing systems and facilities in the building be. And access control system using soft the software from anywhere within the building and outside of it from Internet is available [1].

Intelligent generally a residential unit for the advancement of technology and awareness, and there Electronic devices in different ways and use methods such as Of wireless sensor networks in home automation use Electronic intelligent building energy management systems and keys, there is also this articleThe introduction of these methods, the targets of such buildingsIn order to optimize energy consumption will be introduced. Wireless sensor networks are briefly discussed at the beginningThen explain how it works in homeautomationDescribe.

2. ENERGY OPTIMIZATION USING WIRELESS HOME AUTOMATION NETWORKS

A new generation of sensor networks are networks that Typically consist of many inexpensive nodes andThese nodes will be connected wirelessly. Target at the core of these networks, collect information on the invironment sensor network. The overall performance of these networks to If the nodes collect the data needed and then sends them to the receiver [2]. What the use of these networks has expanded nodes Multiple sensors with low power consumption and low cost of Sizes are too small for short distances They can

communicate together. These tiny sensor nodes according Theory sensor networks, sensing equipment, processing Data and transmit them to be. In sensor networks Accumulation of a large number of sensor nodes are in are scattered, each to his own free will and cooperation other nodes to follow a particular purpose. Nodes together Are near each node can communicate with other nodes And to provide information to other nodes in under extreme environmental conditions, are reported to a central node be. [3] Today, there are wide applications for these networks which including: wireless home automation such as: Lighting control, energy consumption, etc. Hvshmdv noted that Is described below.

2.1. Wireless Home Automation Network (WHAN)

Wireless Home Automation Network On the receiver equipment without are wired sensor and actuator in they are embedded and can control their homes which are used to facilitate the effective management of their homes. These networks typically consist of several devices that they are embedded sensor and actuator may be required to be provided by a battery-powered and often Transmitters / receivers with low power RF(Radio Frequency) Said. Means of communication RF, Flexibility to increase or Reduce network equipment and installation costs are also reduced, Because the use of wireless solutions that often require Channel, duct and cable trays that are specific to your Imposes a separate charge but must also consider the Features such as the dynamic nature of the medium was Radio resource limitations and mobility of devices, the challenges in network design WHAN Raises.

2.2. Energy optimization using these networks

Lighting control: an LED lighting can be from any outlet Control and reduce the need for new wiring. Also lamp can be activated by remote control. In addition, the Lamps can be sensors that are sensitive to the presence or Light, the low light environment, as automatically come on. Remote Control: Infrared technology for many years to Wireless communication Equipment between a remote-controlled items such as TV, LAN Wireless and heating systems and air conditioning (HVAC) has been used. Smart energy use Curtains and Window Systems Air conditioning, central heating systems and can be based the information that is collected from multiple sensors, control that the sensor parameters such as temperature and humidity levels and the presence or absence of light and therefore can payandan with this method, to revent energy loss. In addition, the intelligent power measurement tools for identifying the climax Consumption of home devices that could be used to cause high Consumption have been posted warning signs. The company also the energy supplier will be able to manage time, energy,

Networks WHAN To use. Safety and Security: advanced security systems can Based on multiple sensors such as smoke detection, diagnosis Condition of glass breakage and motion detection are Potential hazard identification and appropriate response Are on the agenda. For example, if the symptoms may activate smoke detectors, fire alarms be.

3. ENERGY EFFICIENCY OF THE SYSTEM BUILDING MANAGEMENT SYSTEM AND AND ENERGY MANAGEMENT PANEL(BEMS)

Management and building automation systems to automated monitoring and control systems such as lighting, plumbing, Plumbing, fire fighting equipment, traffic control and heating system Air conditioners are used. This expression system it also refers to the sensors and controls used be. All of these systems from a digital rocessor electronic control algorithms that use frames and leith communicate with other controllers have.Term BMS all control elements include hardware, sensors, communication networks and covers the central controls. To in general, a sensor control system consists of three main parts, Kntlriv a device controller and each comp- onent of the architecture Somehow network communication System in touch. Networks communication is characterized by two essential parts a. Section Physical transmits the control signals, such as Wires, fiber optic and radio be Protocol A set of rules Connection information to establish a common language for the signal. Result building management system, reducing costs through Reduce the cost of commissioning the building.

3.1. Panel building energy management (Smart Home)

System bems the central feature is a digital advanced digital circuitry provides distributed control makes. So all the lighting and building systems heating and cooling, and special outlets covered and the removal of non-essential consumers off In light of the absence of a fully acted intelligently and contributes to reduced energy consumption [5]. there systems against damaging voltage electric shock and prevent leakage of highly sensitive leak detection electricity, gas leakage of water necessary commands has issued orders through telephone lines and cut along entrance water, electricity and gas exports. furthermore, the system alarm, fire alarm and declare equipped with highly advanced earth quake ivr is such that it can sometimes If the warning siren will sound and a telephone. This all electrical equipment is connected to the system and information, and is planning to take out Transfer to or from the outdoors can all equipment remote commands needed to apply. The task protection and safety of people and equipment to bear so they are safe against electric shock equipment in against voltage, current leakage,

theft and fire protection be. also the system informed them earlier quake automatically makes and breaks the flow of water, gas and electricity. In this system, the circuit instead of the typical keyboard pressure switches are used and therefore no spark when a disconnect or connect to does not exist. other benefits of turnon or turnoff the lamp this method can be possible. Using building energy management control panel for all devices and light as possible is central to all power tools and lighting from one point to control center and also have access to a lamp sumit also allows for the building lighting and be are using this system, switch board building that old there are no changes in the control wiring and it is also possible to define peak hours for building to intelligent systems at peak hours, wasteful consumption of the circuit is off. Use bulletin bems buildings reduced tubing and wiring to be. Some form of intelligent energy management panel as follows:

- a) Telephone and remote lamps and electrical quipment to enable or disable.
- b) Having the function keys to save energy and turn off the lights the whole house or individual rooms for each case.
- c) Use leds bright white to clarify relative space in case of a power out age automatically.
- d) Ability to monitor and disconnect the ac power voltage consumer In the event of unauthorized use and power control during peak.
- e) For children, the elderly and the sick in home care audio and establishes a special move.

4. ENERGY EFFICIENCY, USING THE KEYS ELECTRIC SMART

Smart keys with remote control, an easy way to control and create a favorable environment on the other additional fees will decrease with energy. however, in the buildings there are other solutions as for example , using sensors to the presence of guidelines. using the functions of smart systems adjust the intensity of lighting, curtains and canopy control , time lighting configuration , etc. combining the natural light of the sun and light makes the addition of artificial lighting favorable to sub stantially save energy money. Connect to all buttons and controls there is an intelligent system. Intelligent switches have thermostats are. The temperature optimum user comfort is set using the control devices and cooling are activated only when necessary and thus, in addition to the desired temperature, there is always a reduction energy costs are a significant cause [6]. Using Smart keys, you can define a temperature scenarios provide like scenarios, export, evening control all heating and cooling systems also have integrated there. For this purpose, can be a smart screen or panel control can be used. Smart key information such as ambient displays [7].

5. AN EXAMPLE OF THE CREATION OF SUCH SYSTEMS IN THE OF A HOUSING UNIT

In the space of a housing unit with internal control requirements separation of spaces [1].

Upon arrival at the building entrance

- To clear the paths of light required in the path way to reach the desired location.
- Creating a favorable temperature on arrival and define the desired temperature while at home.
- Ability to adjust the interior light with light in the environment (in both day and night time).
- Ability to adapt with the times behind the curtains and lights presence (in both day and night time).
- Ability to report in terms of time and number of entry and exit specific.

Entrance to exit

- Turn off all the light paths.
- Create and define the desired temperature at the exit temperature in the absence of a good home.
- Ability to adapt with the times behind the curtains and lights Presence (in both day and night time).
- Possibility of simulate at home.
- Ability to report on the status of open, closed and windows.
- Controlling the opening and closing curtains or even a path lighting to provide light for ornamental flowers.
- Ability to report ambient temperature and weather conditions outside.

Bedrooms

- Ability to control and define the different scenarios the intensity required.
- Ability to define different scenarios (day and night) on control curtains.

Fashion Study

Turn up the sound system, creates light intensity required to study the regulation and use of natural light curtains are available in environment, establish the optimal temperature in the space. such an intelligent system in place, even for the most minor a home is well thought out measures, for example:

control requirements in the public spaces of a esidential building separation of spaces.

Stairway

- Lighting control based on presence and schedules.
- Ability to access control and coordination of emergency and the use of emergency lighting.

Parking

- Lighting control based on presence and schedules.
- Opening and closing the entry and exit of vehicles approaching residents when traveling.
- The exhaust fan control based on presence and control scheduled [1].The use of intelligent systems for residential units modern sports space are also possible:

Physical activity (swimming pool, sauna, jacuzzi, gym)

- Ability to control lighting, sports facilities arrival and later leaving the possibility to define different scenarios depending on the type of user.
- To distribute sound in a sports environment.
- You're the light from the pool area.
- Ability to control, monitor space, sports, active or non to activate check points inside the unit, such as a sauna and commissioning jacuzzi before returning to sports space [1].

According to the description given, it can be seen that these intelligent systems, even for the most part in home such as the study went back to the entrance, etc. measures are considered. Therefore, if culture can be between the people of Iran would make such buildings to saving energy is largely in use. Aside from the issue of energy consumption, with the creation of the project, in addition to the building will have a better and more beautiful appearance; cause of order and integration between different elements in building a the word comfort and safety of its residents will be building.

6. CONCLUSIONS

One of the most important points in buildings ranging from residential, commercial, hospitals, hotels, etc. are considered which is the energy optimization problem. in iran given the importance of energy savings, which in many due to recent increased use of fossil fuels , limited resources and the prices are growing more taken into consideration is the use of management systems and intelligent buildings use a significant amount of reduces energy and also in terms of comfort and safety makes more sense. Therefore, this article tries to open the door the impact of an intelligent network using wireless sensor networks home automation, energy management systems, switches electric Smart building for energy and the importance of what has so far been ignored in the with only brief references are listed [8]. If applied points raised by the designers of the building occupants residential and non-residential, easily the one hand, while reduce pollution from energy that fuels fossil is provided and serious threat to mental health physical society has created, and also reduce the additional costs , we can use new technologies and electronic Smart network design for energy efficiency ago going. The biggest issue in this case dictionary creating such public buildings and homes is the solution to this issue that the government has sufficient information about the benefits of such systems In this regard, the funds will also be used to set up these buildings do hope to make this culture among all people and nations to build and need and develop advance.

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