

SMART LAB

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Abstract

The vision of "IoT" is to enhance the capabilities of objects and forms a smart environment so that people will benefit from the IoT revolution. As the population grows the global resources on earth are depleted quickly. In order to have a balanced earth, governments around the world put a lot of efforts to advocate the depletion of carbon production as well as to emphasize the benefits of reducing the consumption of energy. The theory has been encouraged on campus of educational institutions as well. Smart campus is a trendy application in the model of the IoT.

This research has the concept of the "Internet of Things" to construct a green campus environment which will notice the idea of energy saving. The architecture of green campus is established and three application systems have been developed as well. The efforts of this work allow the campus to manage the computer labs more efficiently. The sensor network will save more energy since data are reported regularly and the analysis will be carried out in time to locate the problems.

Keyword: - Internet of Things (IOT), Green campus, Remote monitoring, and Cloud-based monitoring system.

I. INTRODUCTION

More than 85% of systems are not connected and do not share data with each other or the cloud. One such technology that ease the interconnection is the INTERNET OF THINGS. The Internet of things is a communication that refers to the idea of connecting the objects of everyday life to the internet. These objects are assembled with microcontrollers to enable communication, and configured with protocol stacks that will realize the interaction of the objects with one another to reach to common goals without human intervention. This paradigm obtained its strength from interacting with a wide variety of devices such as robots, drones, heating and air-conditioning systems, security alarms, household appliances, power generation systems, office equipments and so on, which generate a huge amount of data to provide new services to people and both public and private sectors.

As campus grows every year, new management problems issues appear. Smart devices of IoT can be used to replace some traditional devices so that sub-system devices will connect to each other for better access to construct an IoT network. Human efforts are reduced when things get automated. In traditional system all the works used to be done manually and its wastage of time. Monitoring all the student's performance is very cumbersome. With the help of our proposed system the admin can monitor student's activities inside the lab automatically.

II. OBJECTIVE

The main objective of the project is to provide a smart computerized laboratory system in college campus which helps the admin to monitor the activities of the respective students. In the proposed system we create a web application for smart laboratory system in a college campus. The college admin is responsible for adding all the student details in the database. All the students are given a RFID tag with the help of which they can have an access to the lab. When a student wants to enter a lab, he/she needs to scan his/ her RFID tag and then the information of the student is being sent to the server.

All the data's gets stored in the database. RFID detector is used to detect the tag number and the USN number of the respective student. If the details get matched then the student will have an access in the laboratory. In the lab all the systems are connected to each other. If the system is ON and someone is using the same then it will show green light, if the system is OFF then it will show red. First it will search for an idle system and if found then it allocates the system to the student or else if not found then it will search for the system which is OFF. When the system starts it will automatically ask for user id and password, if matches then it will allow the user to have an access over the system. Admin can check each and every activity, he can check what all the folders are being accessed by the student, what all the background applications are running, can monitor the browser, detect pen-drive connection along with that it will automatically close the respective application/browser.

III. PROPOSED SYSTEM

As the number of students increasing day by day as the technologies are improving day by day. So, there should be a system where we can monitor the activities of the students in the lab. And an automatic alert system is needed in case of any forgery.

In order to construct a green campus with the usage of the Internet of Things, this research reviews the cores of IoT, cloud computing and wireless sensors network. This paper also shows our work towards establishing a green campus. The ultimate goal of this work is to implement a cloudbased monitoring system built upon wireless sensor network architecture so that data are gathered and stored on cloud database and the analysis can be carried out at times. To reduce the task completion time running on low end machine, we will offload the task to the available high-end machine so that the system on time can be reduced to save power. Admin can check the status of the running machine remotely and can control the machine from remote place.

IV. ARCHITECTURE DESIGN

The structural setup methodology is worried with working up a fundamental, essential framework for a system. It incorporates perceiving the genuine parts of the structure and exchanges between these fragments. The starting design technique of these subsystems and working with structure for control and correspondence is called development demonstrating plot and the yield of this framework method is a study of the item basic arranging.

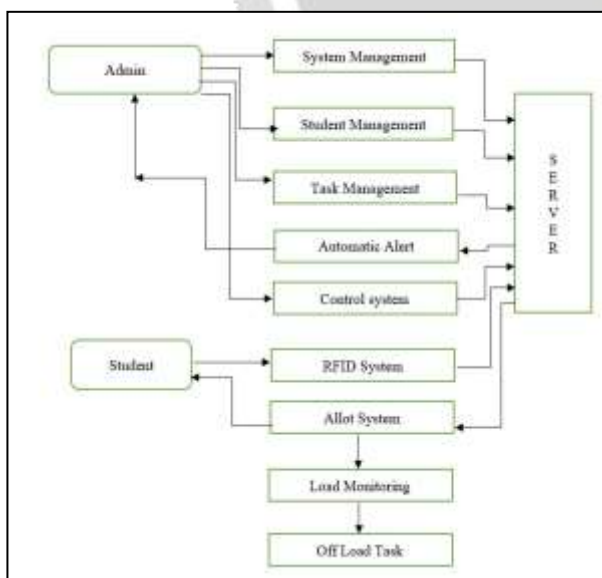


Fig 1: Architecture of Smart Lab

The proposed design for this framework is shown above. It demonstrates the way this framework is outlined and brief working of the framework.

Lab Details: Admin adds the system details of all the computer labs in the college. System details contains system name, lab name, system IP. System ID is generated automatically. Admin can check the list of ON systems in a respective lab using a ping mechanism.

Students Details: Admin registers the student's details and assigns RFID tag. Students can use this RFID tag to use a system in the lab. Admin can manage and delete students. **Assign System:** When a student enters a lab, he/she swipes the RFID tag and the detector sends the tag number to the server. Server checks the available system and sends the details and activates the login screen on that system. Student then logs in to the system and the status becomes available. The system puts in sleep mode as soon as the student logs off to save energy.

System load: Admin can check the total load on a CPU and gets automatic alert if the CPU load exceeds the threshold value. If any low-end machine has more load, then at the same time if any high-end machine is available, then the task will be offloaded to the high-end machine so that the task can be executed faster.

Remote monitoring: Admin can check the system status from his Android based App. He can control the systems from the App.

V. CONCLUSION

This research appeals to the responsibilities that universities should bear in the issues of environmental protection. The performance of the technologies that may contribute to the renewable of universities is emphasized in the paper. This research also proposes the steps and the architecture of how to construct a green campus by utilizing the advanced technologies smartly. Furthermore, this research assumes the concept of the "Internet of Things" to construct the green campus which will realize the idea of energy saving.

RFIDs are used to build up the wireless sensor network

VI. REFERENCES

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