Institutional Information Management and Automation System

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Abstract
World is moving towards digitization at a rapid pace, so the enterprises have developed information systems for management of their business. Empowering educational institutes with information systems are become very important and vital. Doing everything manually is very difficult for students, teachers and staff. Information system can enhance their efficiency and save a lot of time; this research proposed system will solve this issue by providing services like class room reservation, e-library facility, online submission etc. in a secured environment. Up till now limited attention has been paid to utilize robots and drones for automation inside educational institutes. Our proposed system incorporates robots and drones to fill this gap in automation being used in institutes. Through this research, the aim is to improve the efficiency of learning and services in educational institutions or universities.

Keywords:
information system, digitization, services, automation, drone, robotics

I. Introduction

From the last two decades, Information technology has started to flourish and impacted our daily life and has a huge effect on the quality of life. Information technology has revolutionized every industry and provided ease in different processes. Mostly task in institutions are performed manually which is time consuming. In current educational institute or university information systems student can submit their work online, teacher can view them and give them feedback online. With e-library facility student teacher and staff can reserve books online, search available books etc. But still many things are being performed manually and need to be automated.

Well known teleconferencing tools like Skype and Adobe Connect are good for teleconferencing but they have some limitations like they are not mobile and the person using them, and they can't change view by themselves. People attending conferences remotely can feel disengaged and loses interest as they can't effectively interact. Thus better teleconferencing tools are needed and a teleconference robot can prove to be better solution for it [1]. Institutes should educate people about security and importance of their login credentials. It will contribute to make their secured systems more secure.

After going through different research papers related to system automation, we found that researchers have paid minor attention to using robots and drones for automation. In modern days robots and drones are immensely important for automation. The trend of robotics is increasing day by day and sooner or later we will be seeing robots performing various tasks around us. Robots can be used for different task like Tele presence, serving meals in cafe. Every institute has a medical or first aid facility and in larger institute, it is not possible to immediately provide first aid to any participant if any unfortunate incident has occurred. So for this purpose first aid drones can be utilized. For security surveillance drones can be used, which can provide coverage of different locations of the university. In case a guard is not present at a location or if any institute has limited no. of guards then a surveillance drone can be used for surveillance. Entire system will be interconnected and will be managed through a central server.

II. Related Work

Discuss that E-learning can generally be categorized in four types:

- Learning Management System (LMS)
- Learning Content Management System (LCMS)
- Learning Design System (LDS)
- Learning Support System (LSS)

[1, 4]The fore most emphasis of researcher is on Learning Management System (LMS) which is being used in most of the universities over the globe. It is also named as virtual learning. With the passage of time, LMS usage and improvements are increasing immensely every year. It gives the opportunity to both students and teachers, to learn and teach respectively, by providing an appropriate environment without any time or distance limitation. It is a web-based technology,

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which is a software designed atmosphere, to achieve user learning process and also provides learning content to the end users [1]. It is a system which also tracks user's learning process and also communicated via emails, for instance as a reminders if someone is getting late in his learning process. So in this way not only this acts as a learning environment but also as a tool for evaluating your skills in a specific field though quizzes and online labs test. Content could be a stored material or be a one-to-one real time class room [2]. Main benefits of E-Learning are as follows:

A. Money Saving

There is no need to build a physical classrooms or offices for training centers. You can easily start a training center online which will not only save the money but the resources as well.

B. Affectivity

In an online class you can use multiple things such as a notepad, multiple tabs, video illustration etc. which makes it more effective for learning process. It overall increases the efficiency of learning.

C. Accessibility

Unlike physical class, you can access online course content at any time without any restriction of time. So one can easily manage his schedule and resume the class any time he/she wants. This flexibility is one of the major factors of popularity of E-learning process.

Apart from that, it also provides an environment where students and teachers can interact with each other in real time and discuss their views/problems same as a traditional classroom provides [3].

The portal by Crucial Research, "The Role of People in Cyber Security: A Consumer Perception," 2014. The department of Electrical and Information Engineering at Pakut University in Nigeria work in the project management process. The process begins with the appointment of the chief superintendents to the pupils with the pupil's consent after the course has been refused. This library is used by clients to access older people. Using the repository, students can see the appropriate investigators in their program, and the audience can assign the students to them. You can talk to students between your supervisor and the board of trustees. Using the repository, students can upload the first business report to their guide and add the final project report to the repository. The students will take the final year project clearance after year through the portal [5].

This technology is used as a device to increase effectiveness of institution and productivity. It permits users to connect with subsystems of the institute to get associated material. In advanced countries most of universities are purchasing portal facilities to achieve their requirements [1].

This system is used in the areas used to organize activities such as supporting communication and communication. Relationships are defined as actions or behaviors [5].

One of the key points of the conversation is that sharing information is only information exchange, but technology. Secondary schools expect daily access systems [5].

Internet threats are a major problem for any type of computer or designing systems. By the last few year's research, it has come to be known that security and privacy breaches such as the photos of some celebrities leaked from iCloud. So by this activity it has again proved that security is not a concern for security specialists only. Everyone wants to learn how to protect themselves from this menace. People believe that new technology, in the field of security, is much enough for the privacy of their information; but this is a wrong perception. Even large organizations invest a lot to dedicate more attention to security regulations during the implementation of a security system [6].

For the public information system at academic campus, there should be a main concern on security of the information provided by the people at educational institute. In 2014, the annual Splash word list was released with the word "123456" at the top of the list of cases. Security systems should use password protection and secure and secure them in a private or confidential manner. However, people are using some deception to protect their security system. According to the survey, people can keep their passwords in the mailbox at the bar or share it with friends to do things quickly. Institutions do not meet the expectations of security personnel. People will continue to watch the door to break down security. This type of behavior is common, for example lack of knowledge and understanding, reluctant culture, lack of training for staff, lack of training for officials, lack of technical staff and competence, as well as differences in culture and culture. There are many reasons [6].

Security of information system of an educational institute depends upon the size of the systems. If the size of the system is smaller than other organizations, then it will have more chances to get hacked by the black-hat hackers. These hackers usually attack small organizations whose purpose is money or pranks.

Many hackers commit serious crimes and use sophisticated technology to compromise the security of the system, and only to preserve the personal information of the organization [6].

An information system for the management of graduates and graduates has been developed. The system is web-based and is intended to cover all types of subjects in postgraduate subjects [11].

Cyber Patriot is a national online youth education program. The Cyber Patriot program, the National Cyber Youth Contest, the Cyber Education Initiative for Primary Schools and AFA's Cyber Camps line offer three main programs. The Air Force Association (AFA) has developed Cyber Patriot to engage students in new areas of information security and mathematics (STEM) that are critical to the future of our nations. [6] Knowledge is the most important part of any organization's growth, including: As we see, the Internet and the World Wide Web (WWW) are the most important tools for receiving all kinds of information from professionals and non-professionals
. There is a wealth of information on the Internet and search engines make it easy to search.

An evolution has observed in the ways people practice computers to get their essential information but all the information on the internet is not protected due to certain vulnerabilities. Web portals/services are used to interchange all these kinds of information. Many CMS solutions are used to sustain these web pages [7].

Joomla is one of the further most prevalent open-source Content Management System, which is extensively used to construct Web sites and dominant online applications. Due to its popularity and the widespread use, it is a common objective for attackers. ISO/IEC standards are established on Joomla, which are used for safety and verification of websites.

ISO/IEC 27002 is an internationally-recognized standard, used for implementing and managing information security. In ISO/IEC 27002 Access control models are used for web security. There are vulnerabilities in both open and closed source software. Open source software can be secured by using these following authentications:

- Network access and connections should be limited.
- Users should be conscious of their accountabilities towards maintaining operative access controls e.g. implementing strong passwords policies and keep passwords confidential.
- Information access should be safe in accordance with the access control policy e.g. through restricted/secure log-on etc [7].

Closed-source software is not much better as compared to open-source software. According to Lawton analysis, it was observed that many large companies maintain their security and dependability while using open-source software [8]. However to check the security of web pages, based on Joomla, testing is conducted by using some testing tools e.g. snort, snare, tripwire etc. Open source software is good for implementation if they are secured by using ISO 27000 standards. If the guidelines of these standards are followed, joomla can be used for sensitive websites.

The unique qualities of humans can affect the use of their network. Similarly, the different age groups assigned to the network to exploit it. In addition to the statistical components, there are various reasons why under-qualified people use the Internet to search for information. Lower level researchers use the network to gather more information to understand addresses and mission ideas. This is similar when it comes to studying at university because it also has a basic understanding of computer-based learning and hunting techniques and the ultimate goal of earning rewards when using the network for information. This study shows that the network can be wonderful and destructive for students because they can use it for their estimates, but they can unfortunately also be used by various websites. The Learning Management System (LMS) is one of those frameworks used by various universities around the world. There are essentially four different eLearning frameworks: the Learning Management System (LMS), the Learning Content Management System (LCMS), the Learning Planning System (LDS) and the Learning Management System (LMS). Learning Support System (LSS). In the end goal of this work, we focus on the Learning Management System (LMS), an online learning system used by various universities around the world. This is a product situation that aims to monitor the teaching of customer learning and to transfer teaching materials and teaching materials to under-study. The learning management system may also refer to an application used to monitor, monitor and maintain the system, and is specifically used within the learning area. Normal learning at school or at the third cycle. In addition, the learning management system is one of the precautions that students and educators enjoy for e-learning. LMS are devices for correspondence and communication between students and speakers. LMS offers smart components for undergraduate studies. The Ramayan concert revealed that many universities are using the Learning Management System (LMS) for eLearning courses and missions. However, many teachers limit

themselves to transferring the course material to the course page and never use intuitive elements such as mixed results surveys. In addition, the benefits of the learning management system have given rise to the prospect of making better use of it than the ease of use of learners [10].

Tele presence is a type of remote control that allows a person to wait in the network, or at a distance. We will explain the technology and briefly, the results of the research will reveal the robots. We prioritize the benefits of low-income students' Tele-printers and include user ratings and demonstration benefits of Tele-processors. Although the research presented here is not limited to the needs of the affected users. The Tele presence Robotics program has been re-acquired by other entities and growing Tele robotics sites such as Double and KUBI. More and more people are using robotic Tele presence software to interact with others and exchange information visits, exchanges, e-mails, messages. Requests for information on the use of LMS were based on partial with them in future educational and other systems [9].

III. PROPOSED SYSTEM

In case of any data lose, database server can fetch backed up data from cloud. In this system respected participants will login to information system website of respective institute, with their ID and passwords. After login participants can request different services from the list of available services. Information system will run on main central server, it will receive different requests from participant and transfer those request to relevant people, and then they can take action accordingly. In this way all departme

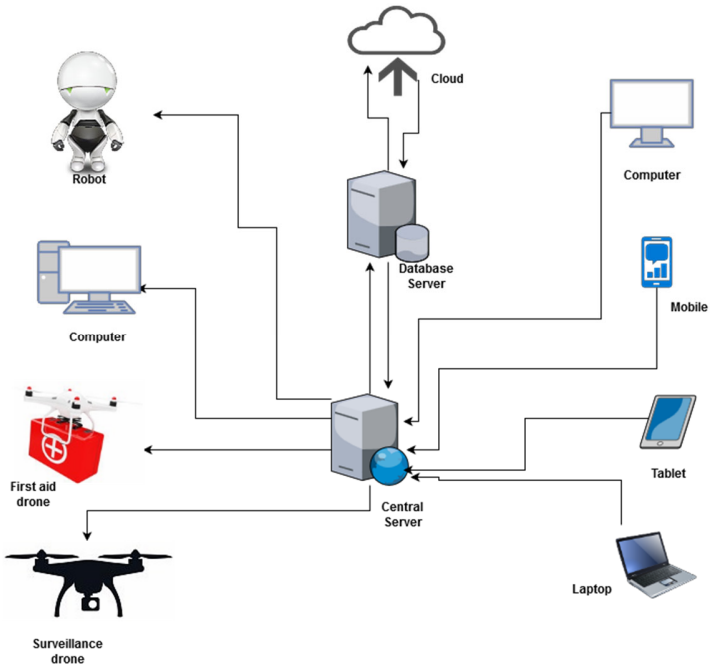

Figure 1: *System Architecture*

Robots and drones will also be connected with the central server. Drones will be controlled by humans from a security control room. We will have two types of drones. 1- Surveillance drone, 2-First aid drone (figure 2). Camera is good for security, but in case you want to keep a better eye on specific location or you need a bird eye view of the campus, then drones can do it much better than a camera. First aid drones are being used by different emergency rescue services in different countries. In case of emergency first aid drone can reach location of emergency faster and earlier as compared to first aid team. If road or path leading to a location where emergency has occurred is 2 Km then first aid team will have to cover 2Km to reach that location, there will be turns in the path and traffic which will slow down the speed of first aid team. While on the other hand drone will go through air in a straight path and it will not be slowed down because of traffic. Drone doesn't have to follow road or path; it can cover displacement easily and faster. As drone will cover displacement in a straight path so, drone will need to travel less than 2Km to reach location of emergency. This will make the distance shorter for the drone. It will help to save time and lives in case of danger for example if operator of a surveillance

robot identifies a situation where first aid is immediately needed then he can tell the first aid drone operator to immediately send the first aid drone which will reach the location before medical staff.

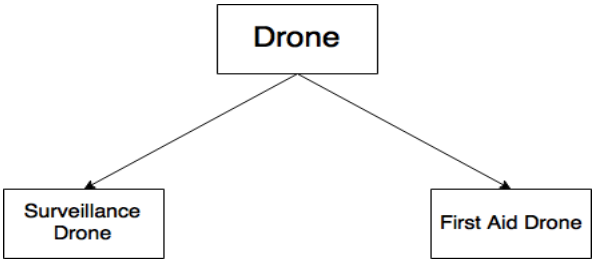

Figure 2: *Type of drones*

Robots will be of two different types 1- Tele presence robots, 2- Waiter cafe robots (figure 3). Tele presence robots will be available and if someone wants to use them then they can make a request through the system. Tele presence robots can be booked or reserved for a specific time. Each robot connected with the system will have a separate ID which will help to uniquely identify the robot. Tele presence robots can be utilized in class rooms, when teachers can't reach in class or institute due to any reason e.g. weather, illness etc. People who want attend a conferences or meeting but can't manage to reach their institute due to any reason. The limitations of teleconference can be addressed with Tele presence robots which will provide desired mobility to their users. Deans and Rectors can easily check the ongoing situation of classes and their institute. Waiter robots can be used in institute's cafe where they can provide meals to different tables of the cafe. Waiter robots will also be able to take orders from customers of cafe.

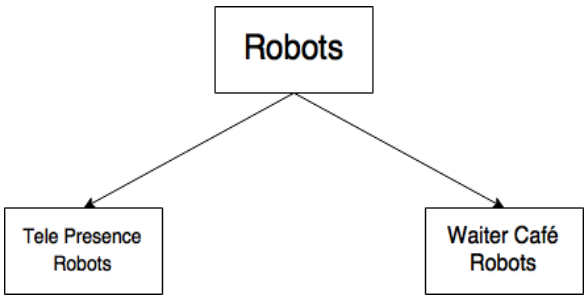

Figure 3: *Type of robots*

For security purpose different actors will be assigned different roles relevant to their task. After login every actor can perform activities according to their role. Different dashboard or panel will be shown to different actors like teachers, students and different staff members. Data of accounts and other critical information can be secured using encryption.
Further our proposed system also includes these things like room availability can be checked online and can be booked for extra classes, makeup class, conferences, meetings etc. Student can also provide subject's feedback. Participants will be able to check cafe menu and can place order online. Students can check their results, fee online. Students will be able to apply for clearance and FT online. Further in addition to these things electronic whiteboards will be used in classes to enhance learning of students and aid teachers in teaching efficiently. Peer review facility of our system will be extremely helpful for research community of the institute.

IV. CONCLUSION

In this research paper, an Information system's framework is proposed for an Educational institute. This information system will provide facilities like digital library, E-Learning along with other robotic services. Digital library will provide the facility for both teachers and students to access the library from remote areas. By using E-Learning facility teachers can book for makeup class, conferences, Tele presence Robots etc. Other on-campus services like Surveillance robots, First Aid drones and Waiter robots can also be availed via this system. This Information system will be a secured system which will authenticate the user by their login-credentials and it can be accessed through PC or different hand-held devices. Proposed model will help to improve the efficiency of learning and other on-campus services in any educational institute.

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