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Digi-Class

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Abstract— *This project consists of automated lighting system of the class. The lights of room and corridors are connected to the Internet. They work on both manually and on internet using (IOT technology). A camera is installed which monitors the automated light system of the class or corridors. On giving the specific command on website, the user can get a current image of that place via email. This system is for saving of electricity and having ease digital access to it.*

The project also consists of a student profile management wherein the profile of each and every student is developed. It also consists of an RFID based attendance system that allows for automatic attendance marking by using RFID tags. The student profile software is made on using VBA programming (visual basic – excel).

Key words:*IOT Technology, RFID, Attendance, Automated Light System.*

I.INTRODUCTION

The attendance system in the present situation is extremely tedious and inclined towards manual submission and susceptible to human error. It additionally tends to be problematic and time consuming for the employees to perpetually enter information from the sheet, to the register then finally to an excel sheet for the monthly average. This method has several drawbacks and also the marking of attendance itself is unnecessarily tedious. Attendance is a very important factor in a student's academic years since it decides whether or not the student is eligible to take a seat for the final papers. We are able to consider several technologies like biometric, RFID, NFC, Barcode etc. which may be accustomed eliminate the drawbacks of all 3 systems. [1]

II.WHAT IS RFID?

RFID stands for "Radio Frequency Identification" and refers to technologies that use radio waves to identify objects or people automatically. Typically, a serial number or other product/object-related information ("identifier") is stored on a microchip. This chip is attached to an antenna that enables the chip to transfer the information needed for identification to a reading device. The combination of antenna and chip is called an "RFID tag" or "RFID transponder."
RFID readers create an energy field which activates the tags. Most common RFID tags are passive, which makes them largely maintenance-free. Depending on the type of RFID tag, a wealth of different product-related information can be stored on a single tag. [2] RFID systems can be classified by the type of tag and reader.

A **Passive Reader Active Tag** (**PRAT**) system has a passive reader which only receives radio signals from active tags (battery operated, transmit only). The reception range of a PRAT system reader can be adjusted from 1–2,000 feet (0–600 m) allowing flexibility in applications such as asset protection and supervision. An **Active Reader Passive Tag** (**ARPT**) system has an active reader, which transmits interrogator signals and also receives authentication replies from passive tags. An **Active Reader Active Tag** (**ARAT**) system uses active tags awoken with an interrogator signal from the active reader. A variation of this system could also use a Battery-Assisted Passive (BAP) tag which acts like a passive tag but has a small battery to power the tag's return reporting signal. Fixed readers are set up to create a specific interrogation zone which can be tightly controlled. This allows a highly defined reading area for when tags go in and out of the interrogation zone. Mobile readers may be hand-held or mounted on carts or vehicles.

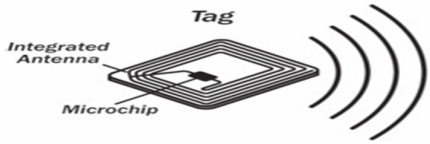

Figure: 1 RFID Concept

III.WHAT IS IOT?

The Internet of Things (IOT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. Typically, IOT is expected to offer advanced connectivity of devices, systems, and services that goes beyond machine-to-machine (M2M) communications and covers a variety of protocols, domains, and applications.[3] The interconnection of these embedded devices (including smart objects), is expected to usher in automation in nearly all fields, while also enabling advanced applications like a smart grid, and expanding to the areas such as smart cities.[4]

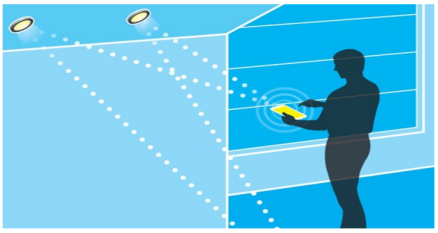

Figure: 2 Internet Of Things Concept

IV.WORKING

Basically, there are two parts in our project, one is the lighting system and the other is the profile management. Automated light system has a website and visual basic software. The commands on the website are refreshed and taken into the VB software. The software then sends command to Arduino (micro-controller) via COM-PORT. On giving the command on the website, the camera which is connected to the visual basic software, saves the image of that particular time and then sends it on to the user's email id using Gmail.

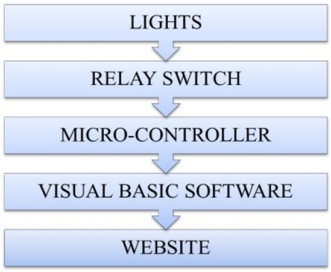

Figure: 3 Working of IOT concept

The student profile software is made on using VBA programming (VB–excel). ID card will be tapped twice a day for the entry and exit timings. According to the taps the timings of the student are recorded and thus it adds a new feature to our project. Not only this but also marks of students of weekly test as well as the other curriculum activity are getting recorded in the software. So not only the attendance of the student is calculated but also his activities in the college are recorded which further be used for the development of the student.

Figure: 3 Working of Attendance System

ACTIVITIES OF VBA PROGRAMMING

- Attendance in college
- Exit timing
- Duplicate id card
- Duplicate issue
- Proxy detector
- Late entry
- Warning for late attendance
- Counselling for attendance
- Counselling update
- Parent notification
- Student notification

IV.ADVANTAGES OF SYSTEM

The main advantage of this system is that you can control all the specific lights remotely. This helps in proper utilization of electricity. We can get the live image of the particular system by just sending the command on the website. This system is fast enough to take all the data of an individual. It's fully automated, reliable and accurate. It also helps in reducing paper based work and time. This system ensures authentic attendance and no proxy attendance.

V.HARDWARE SPECIFICATION

- RFID tags
- RF READER
- Intel processor IV and above
- 1 GB RAM
- 160 GB hard disk

VI.SOFTWARE REQUIREMENTS

- Visual Basic 2008
- Microsoft Excel

VII. IDENTIFICATION OF THE PROJECT FROM THE STUDY

A. Feasibility Study

The very first phase in any system developing life cycle is preliminary investigation. The feasibility study is a main part of this phase. A measure of how beneficial or practical the development of any information system would be to the organization is the feasibility study.

B. Operational Feasibility

The site will reduce the time consumed to maintain manual records and is not burdensome and time intense for maintaining the records. Hence operational feasibility is assured.

C. Technical Feasibility

Pentium Processor or Intel compatible processor. – At least 16 MB RAM. – 14.4 kbps or higher modem. – A video graphics card. – A mouse or other pointing device. – At least 3 MB free hard disk space. – Microsoft Internet Explorer 4.0 or higher.

D. Economic Feasibility

Once the hardware and software requirements get fulfilled, there is no need for the user of our system to spend for any added overhead. For the user, the web site will be economically feasible in the following aspects:

– The web site will reduce a lot of paper work. Hence the cost will be concentrated.

– Our web site will reduce the time that is wasted in manual processes.

–The storage and handling problems of the registers will be solved

VIII. EXISTING RELATED TECHNOLOGIES

ONIDA Company has made smart Air conditioner which works on Internet which has a cost of RS. 40,000-60,000. SYSKA bulbs are of Rs 4,000-6,000 and APPLE Lights (IOT) of 10,000-30,000. Amazon and Logitech company has made smart home which using the same IOT concept to control and monitor all the lights and electronic items as luxurious home.

A Biometric device is a security identification and authentication device. Such devices use automated methods of verifying or recognising the identity of a living person based on a physiological or behavioral characteristic. These characteristics include fingerprints, facial images, Iris prints and voice recognition.[5] Biometrics are being used to establish better and accessible records of the hours employee's work. With the increase in "Buddy Punching"[6] (a case where employees clocked out coworkers and fraudulently inflated their work hours) employers have looked towards new technology like fingerprint recognition to reduce such fraud. Additionally, employers are also faced with the task of proper collection of data such as entry and exit times. Biometric devices make for largely foul proof and reliable ways of enabling to collect data as employees have to be present to enter biometric details which are unique to them.

IX. IMPROVEMENTS IN CURRENT TECHNOLOGIES

Basically our project is not only for the attendance but also for the overall development of students. As the teachers can check the total profile of the student and help them by motivating and encouraging them to work harder and focus on their activities.

The improvements to the IOT system can be done by adding different type of sensors, motors and more user-friendly GUI(Graphical User Interface) has helped the user to use the technology easily. Sensors are used in everyday objects such as touch-sensitive elevator buttons (tactile sensor) and lamps which dim or brighten by touching the base, besides innumerable applications of which most people are never aware. With advances in micro machinery and easy-to-use micro controller platforms, the uses of sensors have expanded beyond the most traditional fields of temperature, pressure or flow measurement,[7] for example into MARG sensors. Moreover, analog sensors such as potentiometers and force-sensing resistors are still widely used. Applications include manufacturing and machinery, airplanes and aerospace, cars, medicine, robotics and many other aspects of our day-to-day life. POE technology can be used to extend the wire of the RF reader, for the better transmission of data for long distances.

X. POWER OVER ETHERNET

Power over Ethernet (POE) is a technology for wired Ethernet LANs (local area networks) that allows the electrical current necessary for the operation of each device to be carried by the data cables rather than by power cords. Doing so minimizes the number of wires that must be strung in order to install the network. The result is lower cost, less downtime, easier maintenance, and greater installation flexibility than with traditional wiring. For POE to work, the electrical current must go into the data cable at the power-supply end, and come out at the device end, in such a way that the current is kept separate from the data signal so that neither interferes with the other. The current enters the cable by means of a component called an injector. If the device at the other end of the cable is POE compatible, then that device will function properly without modification. If the device is not POE compatible, then a component called a picker or tap must be installed to remove the current from the cable. This "picked-off" current is routed to the power jack.

To minimize the possibility of damage to equipment in the event of a malfunction, the more sophisticated POE systems employ fault protection. This feature shuts off the power supply if excessive current or a short circuit is detected

XI. CONCLUSION

Thus this project will help in conserving electricity by avoiding unnecessary lights to be kept on and monitoring them using internet. The idea behind student profile management is to overcome the everyday time and paper consumption for attendance system and also to digitalize the attendance system. Student profile management software helps in development in quality and behaviour of the student.

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[7] Bennett, S. (1993). A History of Control Engineering 1930–1955. London: Peter Peregrinus Ltd. on behalf of the Institution of Electrical Engineers. ISBN 0-86341-280-7<The source states "controls" rather than "sensors", so its applicability is assumed. Many units are derived from the basic measurements to which it refers, such as a liquid's level measured by a differential pressure sensor.>