Anti-Theft Technology of Museum Cultural Relics Based on Internet of Things

Mr.S. Vijayakumar[1], Sriharithra.T[2], Sumitha.S[3], Swetha.R[4]
[1] Associate Professor, Dept of Electronics and Communication Engineering
[2, 3, 4]Dept of Electronics and Communication Engineering
[1, 2, 3, 4] Paavai Engineering College, Namakkal,Tamilnadu,India.

Abstract- *This project is designed to control the theft in museum. With the event of peoples cultural life, art galleries and museums round the world became the primary choice for people to travel. The National museum held quite 20,000 exhibitions, nearly 1 billion people walked into the museum became how of life. This make the cultural relics within the museum even be a neighborhood of the illegal elements. In Museum tomake sure the security,, the museum will develop various protection measures for cultural relics to make sure the security . The museum has exhibited more cultural relics, the quantity of tourists has also increased, and more criminals have stolen cultural relics. This project proposes museum anti-theft scheme supported the web of Things (IoT) technology, which identifies through the passive RFID reader/writers, whether the cultural relics are within the safe range. Once stolen, the cultural relics will leave the effective RFID identification range, which lands up in immediately alarming, then the system starts the anti-theft plan. the tactic is free from traditional infrared anti-theft, door magnetic detection, and thus the likes of , the proposed anti-theft method monitoring has the immediacy and thus the factor of safety is higher and IR sensor based energy saving system during a museum. Finally, during this paper, hardware circuit and software development and tests are administered to understand the required results.*

Keywords- Key Words: IOT, RFID, Cultural relics, Fire sensor, Vibration sensor.

I. INTRODUCTION

A Museum is an establishment that cares for a set of artifacts and other objects of artistic, cultural, historical, or scientific importance. Many public museums make this stuff available for public viewing through exhibits which can be permanent or temporary. The working of our project is predicated IOT Technology. The working of project is to trace Museum objects using RFID based tracking System. the most objective of this project is to trace or monitor individual Museum object using RFID Reader and it'll monitor by RFID Tag. The web of things that are embedded with sensors, software, and other technologies for the aim of connecting and exchanging data with other devices and system over the webwhich describes the network of physical objects. The means of museum was locked at the earliest time.Now we will see within the forbidden city many unopened exhibition areas are hung with an enormous lock. However, duo to the continual development of society, the foremost conventional locking method has many limitations, and thieves can easily open the lock. Later, the hightech system of the museum anti- theft system is sound waves. With the continual development of the industry, people can detect various types and frequencies of sound waves through electronic devices, therefore the sound- proof anti- theft devices inheritbeing.

II. LITERATURE SURVEY

Existing system

A. *A Location-aware system using RFID and Mobile devices for Art Museum.*

Emerging location-aware mobile technologies are being applied successfully in cultural environments. Different technologies, such as RFID, WiFi, and so on, are being applied to allow mobile devices interact with the environment. This paper describes a system based on both active and passive RFID which support the automatic positioning of mobile devices in art museums. In this paper we are discussing the user interaction according to different level so attention required for the user to operate the system. We have defined 3 levels of attention are Lower level, Medium level and Higher level. This proposal results especially useful to provide location-aware information avoiding the need for users to manually select the desired information they want to see. This proposal has been successfully proved for the location and positioning of PDAs.

B. *Suggestion of RFID technology for Tracking Museum objects in Turkey*

This paper investigates the use of data in Radio-Frequency Identification (RFID) technology for museum applications in Turkey. Turkish museums hold approximately

three million cultural and natural artifacts. In addition to protecting movable cultural and natural artifacts, which is important for both natural and cultural heritage, documentation, inventories, and presentation to the public through museum exhibitions are necessary. This paper analyzes the use of RFID technology applications in museums and technological adaptation experiences across the world to address suggestions for Turkish museums in order to overcome some of the problems with inventories and security tracking, as well as to provide dynamism in presentation. In conclusion, we argue that RFID technology can be applied in Turkey for inventories of artifacts, monitoring and tracking collections, and interactive museum displays. RFID technology requires adaptation to museum characteristics including needs, infrastructure plans, and types of artifacts both on display and in storage facilities.

C. *Design and Implementation of RFID-based Anti-Theft System*

RFID (Radio Frequency Identification) is a technology that employed the storing and retrieving data remotely and provides identity codes to the monitored object. It comprises of RFID reader and RFID tag. The RFID tag is attached to the monitored object. The identity codes in the form of unique identification number is stored in the RFID tag, contains all information about the monitored object. In common application, the RFID reader queries the tag to transmit identification data when in the interrogation zone. The process of capturing, processing and transmission of data are executed in real-time. The function of RFID is further enhanced by integrating the sensor to the tag.In common scenario the owner will only realize the asset missing when it was already out of sight. A clear trend indicates that users are looking for the anti-theft systems that not only capable to protect asset but also to prevent loss. The prevention can only be realized if the subscriber is alerted in real-time and the details of occurrence are recorded in the monitoring system for tracking.

D. *RFID-based Anti-theft Auto Security System with an Immobilizer*

This paper presents a novel radio frequency identification (RFID) based vehicle immobilizer system, which features low hacking probability while preserving the safety of the passengers of the hijacked vehicle. The immobilizer uses the active RFID technology where the tag is generated with comparatively large character sets. The receiving unit is intelligently integrated into three control circuits in the vehicle, namely, ignition circuit, power control unit, and automatic gear changing system, enabling it to bring the vehicle speed down to zero in a safe step by step manner. The data transmission and acquisition system basically consists of frequency modulated (FM) low-power radio communication units, where TRXQ1 and RXQ1 are the transmitting and receiving modules used for the wireless communications link between the vehicle and the owner. The anti-theft auto security system proposed here was tested under different weather conditions and possible signal distortion situations to verify its reliability.

E. *Theft Alert System and Auto Arresting System for Museums or Jewellary Shop*

The thesis title itself indicates that whenever someone wants to theft the jewel which is present in the shopping mall then the theft will be automatically arrested with the help of some human detecting sensors and vibration sensor and make the doors to close automatically. That means the thief is arrested. This project consists of two sections. The transmitter section consists of a PIR sensor, a motor a micro controller, a GSM module. It is a museums security device that offers excellent protection to your museums. A museum with Electronic control unit security system helps the user to lock and unlock doors at the press of a button.

F. *An IOT and Control Platform for Museum Content Conservation*

Museums are not only places where the treasures of the past are conserved and viewed for entertainment, but also important educational tools for art and history. To stop or at least low down the degradation rate of artifacts and extend their life, museum collections must exist in a proper microclimate of temperature. As a result, monitoring and controlling the museum ambient condition is most important task to prolong the museum's lifetime. In this paper, we design a IOT layered architecture that categorizes the requirements and functions of the system to three layers. In this paper, we develop an integrated IOT system for museum ambience monitoring and control with the support of anti-theft capabilities. More specifically, our proposed system consists of only three layers: Physical interface layer, network management layer, and data processing layer. The three functional layers of the proposed IOT system, and how they are implemented on the different system components. In what follows, we briefly explain the role of each layer of the proposed architecture, then we present the implementation details of each layer.

G. *IOT based smart museum using Bluetooth Low Energy*

In this paper, an indoor location aware architecture for smart museum was composed. The proposed framework depends on a wearable device outfitted with image recognition and confinement capacities to automatically furnish users with cultural contents with the observed arts.Cultural have always expected a basic part in individual lives. Especially a gallery inmuseumisanestablishmentthataccumulationofancientraritiesa nddifferentobjectsofmasterful,andsomeopenhistoricalcentersm akethemaccessibleforopensurveythroughdisplaysthatmightbela sting. More in purpose, the course of action showed in thispaper engages wearable device, with an IOT. The museum administrator has login credentials and can upload the arts of every rooms based on the Bluetooth low energy type. We can assign new BLE Id in a particular art works. For each art works the video, audio and the textual information content will be uploaded in a cloud. No size breaking point is settled for uploading video, sound, content documents. Every room is infrastructure with Bluetooth 4.0 and each has identity number. Based on this number, the wearable gadget will recognize the user's position in a museumhall.

III. PROPOSEDSYSTEM

The working of project is to track Museum objects using RFID based tracking System based on IOT technology. The main objective of this project is to track or monitor individual Museum object using RFID Reader and it will monitor by RFID Tag. Initially the IR sensor is used to detect the human movement in Museum. Alarm is used to find the illegal movement in indoor of the Museum by the unknown person the abnormal angle detected and also we are monitored and which object is founded abnormal or object is cut by the unknown person. Anyone of thesesensor is going abnormal the emergency alarm is activated the police take respective action. The Internet of Things describes the network of physical objects things that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and system over the Internet. A Fire Sensor is designed to detect and respond to the presence of a fire, allowing fire detection. Response to a detected flame depend on the installation, but can include sounding alarm, deactivating a fuel line and activating a fire suppression system. In Vibration sensor, a piezoelectric sensor is a device that uses the piezoelectric effect to measure pressure, acceleration, strain or force by converting them to an electrical signal.

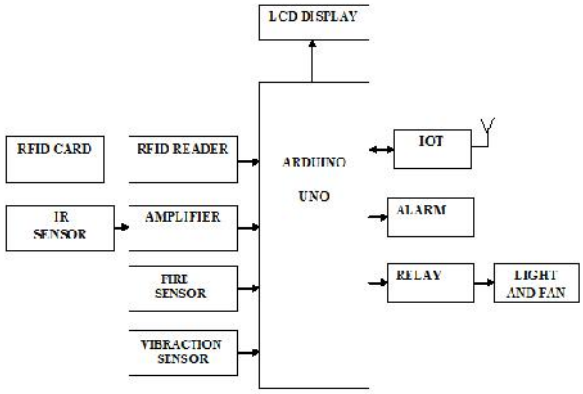

Fig.1 Proposed Block Diagram

Hardware Requirements

This system Circuit consists of Arduino Uno, Radio Frequency Identification (RFID), IR Sensor, Firer Sensor, Vibration sensor, LCD Display, Relay, Inverting Amplifier, Antenna, Regulated Power Supply, IOT, APR9600 sound recorder.

Arduino Uno

Arduino/Genuino Uno is a microcontroller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the microcontroller

RFID

The Transponder or tag is fixed on to the baggage to be tracked in the museum. When this tag comes within the range of the reader or integrator, the tag is energized. In RFID Passive tag, it is composed of a integrated electronic chip and a antenna coil that includes basic modulation circuitry and non-volatile memory.

IR Sensor

In common optic camera it cannot record image at night without light source, an infrared sensor is added to the camera. Because of the temperature of the human body is higher than the other object, the detecting device can find the thief who enters the monitoring area at light and it performs signal processing after receiving the signal, and an alarm occurs.

Fire Sensor

A Fire sensor is meant to detect and answer the presence of a flame or fire. Disclosed herein may be a fire alarm for connecting a plurality of fireside sensors to sensor lines, and giving an alarm in response to fireside information output from the fire sensor in a line unit.

Vibration Sensor

A Vibration sensor may be a device that measures the quantity and frequency of vibration during a cultural relics. A Piezoelectric sensor device uses the piezoelectricity to live pressure, acceleration, strain or force by converting them to an electrical signal.

LCD

LCD module under the relative condition of 40°C and 50% relative humidity. Lower temperature can cause retardation of the blinking speed of t display, while higher temperature makes the general display discolor. When the temperature gets to be within the traditional limits, the display a going to be normal. Polarization degradation, bubble generation or polarizer peel- off may occur with heat and humidity.

Relay

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The coil current can be on or off so relays have two switch positions and they are double throw (changeover) switches. Relays allow one circuit to switch a second circuit which can be completely separate from the first. For example a low voltage battery circuit can use a relay to switch a 230V AC mains c1.36ircuit. There is no electrical connection inside the relay between the two circuits; the link is magnetic and mechanical.

IV. RESULT

The designed scheme of the system meets the expected requirements, and the museum anti-theft system based on the IOT technology is achieved. In the experiment, we also carry out some software function testes. The software and hardware connections are normal, all functions can be realized. The interface is friendly and the expected results are achieved. At the same time, the reading or writing distance of the card reader is simply tested. The rate of the tag decreases as the distance increases. There is no big change, which is the reliable range of application. In actual usage, the reliability can be increased by increasing the power. In addition, the effect of different offset angles on the tag read rate was also tested. The result show that the reading rate decreases with the increase of the offset angle. And also the warning sound or alarm is send to police if any things inside is beentheft.According to the number of peoples count inside the power saving mode willworks.In case of fire it suddenly spray some water and also send message to firestation.Audio setup is there to help people those who can't able to read and understand the art or statue specifications.

V. CONCLUSION

Through the electronic tag anti-collision technology, the recognition rate of RFID in this system has been greatly improved. In the system, museum staffs can view the state of the museum anytime or anywhere, and it is more effective in regulating cultural relics. The effective use of RFID identification range is more valuable than the RFID system set at the import and export location, and the anti-theft response is faster and safer. Of course, the museum with anti-theft system based on the IOT can be widely used in other fields, and it has a wide range of market applications and social needs.

The system has achieved the expected goals with the continuous improvement and development of RFID technology. The warning sound or alarm is send to police if any things inside is been thefted. According to the number of peoples count inside the power saving mode will works. In case of fire it suddenly spray some water and also send message to fire station. Audio set up is there to help people those who can't able to read and understand the art or statue specifications

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