



Movement Tracking of Employee using RFID

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Abstract:

In large organizations where the number of employees or staffs is in big number, it is difficult to monitor each and everyone. In some cases, it becomes mandate for the management to monitor on the work progress. Already there are different methods available for monitoring the employees such as location monitoring, e-mail monitoring, video surveillance, etc. In this paper, employee tracking using an RFID system is proposed. Here, we continuously monitor and track individual employees within the organizational premises. The system is primarily focused on monitoring the work efficiency to enhance the performance parameters contributing to the growth of the organization. The RFID reader that is fixed in the door scans the tag given to every employee within an area during every entry and exit at various checkpoints in the company. Thus, monitoring the current location of the employee becomes simple and more reliable. The system provides a robust mechanism to search for the employee's current location and by default it can be used for attendance of the employees. This system provides different ways to implement in various applications in the future.

I. INTRODUCTION

During the last decade with the rapid increase indoor wireless communications, location awareness services have received a great deal of attention for commercial public safety. The greatest challenge associated with indoor location methods is moving object data and identification. The objective of our system is to collect the data from special badges like Identity card containing RFID tags using this module we can identify the employee's location, number of hours spent in that location and also we can detect the entering and leaving the campus. RFID is one of the pervading technologies that grow rapidly in the competitive world. It is widely used in the application of tracking and monitoring of human as well as product. Recent research has proven that RFID has been implemented in various fields such as education, medical organisation, construction industry and software organisation.

II. RFID TECHNOLOGY

RFID based tracking and monitoring plays a vital role in large scale environment which offers an effective solution of managing items. It uses the radio frequency technology to track and monitor the individual's location along with their working hours. This plays an efficient role of calculating the employee attendance and salary based on the positive and negative hours. Growth in RFID technology improves memory capacities, wider reading ranges and faster processing. It can also be used in tracking of mobile equipments which includes wheel chairs, blood supplies and fusion pumps. If the organisation personnel fails to locate mobile asserts because of misplacement, the value of RFID tracking can be known. RFID empowers tracking and monitoring over the distance ranging from centimeter to hundreds of meters. It replaces the barcode technology, which are not effective in certain cases. Storage capacity is less limited than with barcode, with as much as 2kilobytes of data stored by a microchip in a RFID tag. The processing speed is increased in

RFID tags compared to barcodes. It can be scanned through the medium of human body, clothing and non metallic material due to the utilization of the radio waves for the location detection, ultra sound is used to measure the location and identification.

III. METHODOLOGY

The system is developed as an application module. Process undergoes through two modules in system software, namely

- Recording process
- Administration process.

Recording module performs the operation of detecting the tags from readers, authorizes and then stores the data. The main application is to control RFID tags, taking the specific data from the authorized tags, using RFID readers and then filters the required data for later accessing. Administration module consists of Admin and user login for accessing the data. It plays an eminent role in viewing the attendance and hence calculates the salary based on the positive and negative hours. This module helps in detecting the employee location within a fraction of seconds and in a single click the history of the respective employee is displayed. Below is the observation table for the employee monitoring system that records the specific ID, time, date, along with the location.

Table.1.1. Details to be displayed.

Tag ID	Time	Entry/Exit	Location	Date
7011	2:15pm	Entry	SF-06	13/06/19
7015	11:30am	Exit	FF-19	24/08/19
7012	9:45am	Exit	TF-24	07/11/19

IV. PROCEDURE

A Radio frequency identification system combines programmable tags with the radio detector. When the tag is

placed near to the detector, the detector read the data in the tag through the radio waves. Inventory tracking, secure building access and retail-theft control are used by the RFID equipment. This can be accomplished by using the radio waves .RFID tag is an electronic tag that exchanges data with a RFID reader through the radio waves. It consist of an antenna, which receives radio frequency waves. The other is an integrated circuit, which is used for processing and storing the data, as well as it performs modulation and demodulation of radio waves. In other terms RFID tag is known as RFID chip. In RFID technology, the tag also includes labels and cards. The model of the tag is based on the body or object to which it is attached. The operating frequency can be Ultra High Frequency (UHF), High Frequency (HF) or Low Frequency (LF). Thus, tags is frequency dependent. RFID reader is used to collect information from tag ,which helps in tracking.

V. HARDWARE ARCHITECTURE

For efficient functioning, the electronic product code (EPC) passive RFID tag and Ultra high frequency reader will be used. The wireless link is established using access points, between the tag and the monitoring setup. Once the reader reads the tag it opens the door and closes automatically after few seconds. This section enhances their connection to the database server. Antenna acts as a transmitter and receiver of RFID system that is resides in both the tag and the reader part. RFID antenna can be classified into two classes: tag antenna and the reader antenna.

The two important register in LCD are command register and data register. Command register perform the commands like clear display, cursor at home etc. Data register transfers data which is displayed on LCD. Arduino is used as a Microcontroller which interfaces with RFID reader. It is a single board controller that can control and sense the module. Arduino is equipped with set of input and output pins that may provide an expansion to other circuits.

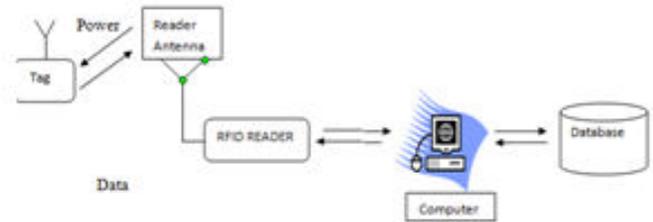
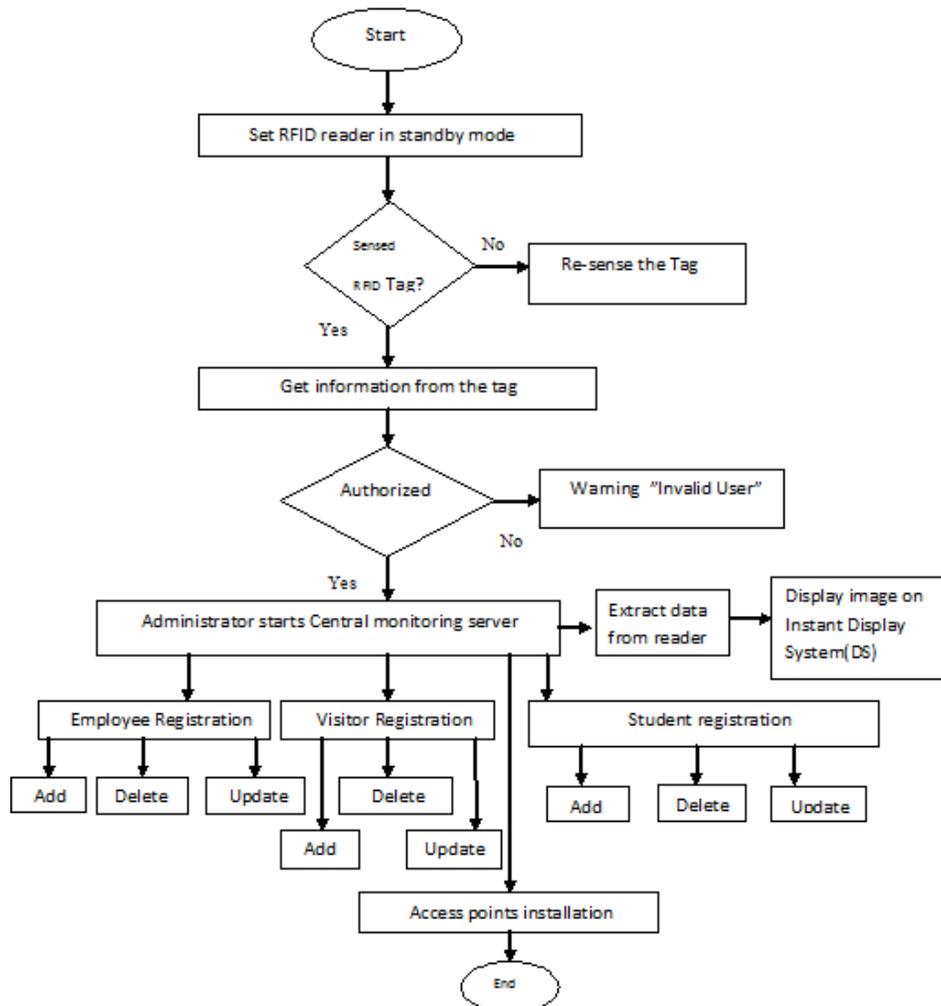


Figure.1.2. Functioning of the module.

VI. SOFTWARE ARCHITECTURE

Software architecture deals with entire communication part related to the server side, an Application Programming Interface analyses and handles the data. The database saves all the information from the clients. It is designed for an multi node environment. The data transfer between server and reader is more reliable.



Major monitoring activities include,

- Automation in staff attendance
- In searching of an employee in a larger organisation,
- Salary calculation based on the positive and negative hours,
- Monitoring the presence without surveillance camera,
- Important evidence in case of investigation.

Above are some of the applications of the module, which may extend in all aspects regarding with our future needs.

VII.OUTPUT

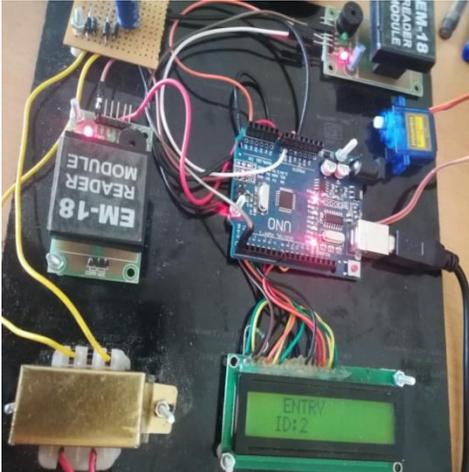


Figure.2.1 Employee Check In

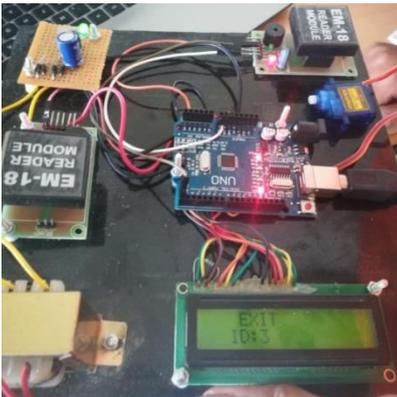


Figure.2.2 Employee Check Out

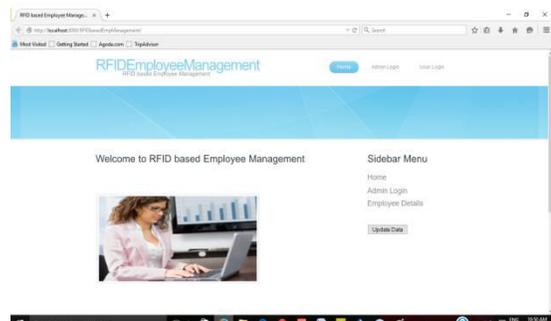


Figure.3.1 Web Application Output

VIII.CONCLUSION

This RFID based employee monitoring system affords an effective solution, which reduces the workload of an

organisation. This module can generate a log of specific details, of each individual employee. In such process, RFID helps in detection of individual's activities with their ID tag. The history of the employee stored in the database, can be accessed for performing the above activities. In addition to that performance analysis of each employee can be monitored as much as faster. By calculating the positive and negative hours, the salary allotment for each individual will be optimum and faultless. This enhances the security of employee's, by tracking their presence and absence in their respective places. The Implementation process might be highly complicated, but after a year it seems to be more effectual and useful.

IX. REFERENCES

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