

# Object Tracking System Using IOT Gecko

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## ABSTRACT

The GPS systems are today's most well-known location tracking systems. Well these systems are not capable of pinpointing exact locations or locations of an entity within a building or on a particular floor or room. So here we propose a smart object tracking system that allows tracking location of objects, goods, personnel within a building or any facility. Our proposed system makes use of RF technology along with IOT to achieve this system. The system has the capability to pinpoint the location of any entity to exact room it is currently located in. The system uses mini RF circuits to be used as tracking devices. We use tracking microcontroller based circuits to track those RF circuits. The tracker circuits are battery powered circuits to be mounted on objects/entities. The monitoring circuits are to be placed in individual rooms. Now as soon as any tracker objects enter any room the tracker circuits come in 2-3 meters range of the monitoring circuit for that room. The monitoring system now transmits the location of that tracker circuit to the online system. We here use IOT Gecko to handle the IOT tracking part. The transmitted data is now displayed by IOT Gecko to pinpoint which room a particular object/entity is located in.

**Keywords:** IOT, GPS, location tracking, RF, IOT Gecko.

## I. INTRODUCTION

In many organizations, the general problem faced is to find out the staff/student immediately when needed. Few methods, which are in use, are the old-fashioned traditional announcement systems. The drawback is that the privacy of the staff/student is affected & it also interrupts the regular functioning of the institution. Generally, many institutions have monitoring cameras to monitor the activity of the working status of environment, but it has certain drawbacks as the coverage area is small & in a crowded place, a camera cannot identify the exact staff/student needed, for it needs a human eye to recognize the presence of the particular staff. In such case, the accuracy and reliability fail. The monitoring unit needs a lot of monitor screen and manpower for continuous monitoring. Centrex will be available in many institutions but sometimes nobody will attend the call. Later on, we will move to location detection method. As we know, many different location detection technologies are available today, GPS one of the most well known. Now day's GPS use to locate a vehicle or an object in the outdoor environment. However, GPS is not suitable for indoor environment

because of its limitations such as reflection or attenuation caused by obstacles, occlusion, etc. Hence, we propose a new method that uses Radio Frequency identification (RFID) technology with IOT, without causing any disturbance to anyone. It is also simple & reliable, requiring no man power. The low cost and robust design of RFID Tags makes it suitable, to be attached to the people in order to track their location in a particular area. RFID is rapidly evolving, and is used with Biometrics technology for security purpose. RFID has been widely utilized for the automatic identification, inventory and tracking of animals, humans, library books, pharmaceuticals, supply chains, merchandise, and other objects. It is used to prevent the others privacy and the regular course of the institution and also the basic challenges such as delay, accuracy, reliability, non- interruption etc. However, more accurate location information of staff/student could enhance these applications, and enable a large number of other applications. Here each staff is provided with a particular RFID tag. The institutions structure is well planned and each of its location is named for easy recognition. Then these locations are installed with a tracking unit. The system is controlled using a

microcontroller and ZigBee is used to communicate. The results are accurate and absolutely reliable. The need of IOT Development increase day by day. The fact that internet of things allows you to control more than just digital objects puts forward a new dimension on the internet. Develop IOT based system that read sensor's values, operate machines, monitor things and do a lot more using IOT Gecko. IOT Gecko cloud platform opens your doors to this dimension with API support over Arduino, Raspberry Pi, Microcontrollers and other controller boards. We can implement indoor tracking system with IOT Gecko very efficiently.

## II. SYSTEM PRINCIPLE

The indoor location tracking system is based on wireless communication services between the reader unit and the tracking unit via ZigBee, and identifies the RFID tags to track the location of staffs & students. The RFID Reader emits a low power radio wave field which is used to power up the tag so as to pass on any information that is contained on the chip. RFID is one member of the family of Automatic Identification and Data Capture (AIDC) technologies and is fast and reliable means of identifying objects. The RFID technology is a means of collecting data about the item without the need of touching the data carrier, with the use of electromagnetic waves. One important feature enabling RFID for tracking objects is that it provides unique identification.

## III. SYSTEM OVERVIEW Most RFID

Systems consist of tags and readers. Tags are attached to an individual to be identified. Each tag has its own "read-only" internal memory depending on the type and application. This memory is to store personal information, of an individual such as unique Identification features. Each Lecture Hall is assigned with the Reader in order to read the contents of the tag specified in the ID cards provided, it generates magnetic fields that enable the RFID system to locate the individual(via the tags) that are within its range. If the data in the tag is matched with the data in program memory, then the result is displayed as "FOUND" along with his/her name, designation, IN Time and OUT Time in the LCD display provided. If data is not matched, then it displays as "NOT FOUND". The high-frequency electromagnetic energy and the corresponding signal generated by the reader triggers the tags.

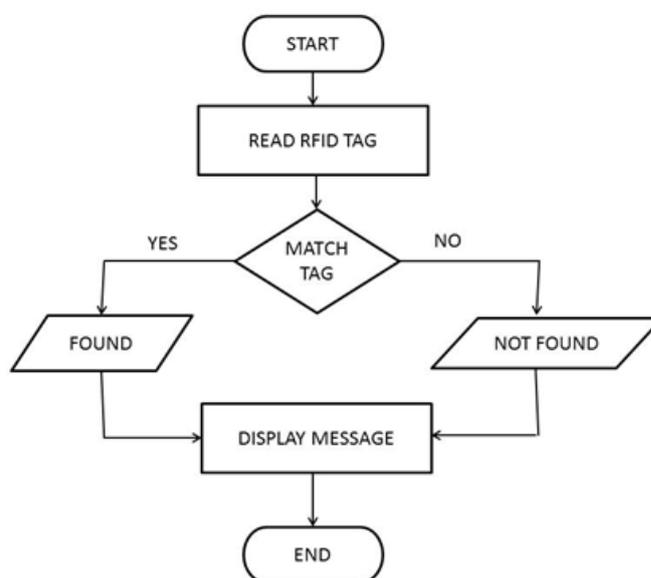
### A. Objective

Point the location of object in the room/floor. Using IOT system development platform using Gecko. Without wasting time and man power, overcoming all the traditional methods that are in use.

### B. System Setup

The Reader unit is placed in front of rooms. It consists of PIC microcontroller, power supply unit, MAX232, RFID reader and tag and ZigBee ,IOT Gecko.

### C. Flowchart



### D. IOT Gecko:

IOT Gecko is a free IOT systems development platform for students, researchers and developers. Opening doors to physical devices controlled over the internet, IOT Gecko provides you the tools and support to design your IOT based systems with ease. Get sensor/device data and use it over the internet. The scope on IOT Development grows day by day. The fact that internet of things allows you to control more than just digital objects puts forward a new dimension on the internet. Develop your own IOT based system to read sensor values, operate motorized machines, monitor stuff and do a lot more using IOT Gecko. IOT Gecko cloud platform opens your doors to this dimension with API support over Arduino, Raspberry Pi, Microcontrollers and other controller boards. Bring your internet of things programming skills to life with IOT Gecko GUI builder

and customized application creator system. Make desired IOT systems using this open source internet of things development platform. Setup your devices and run them on our IOT Cloud today, its free.

#### IV. Summary

So with the Radio frequency identification (RFID) technology that is growing has the potential to make great impacts on economic of many industries. There are more recent advancements in chip manufacturing technology that makes RFID practical for new applications and settings. At its most basic, RFID systems consist of small tags, attached to staff/student. When wirelessly interrogated by RFID transceivers, tags, readers, respond with some identifying information that may be associated with arbitrary data records. RFID system is one type of automatic identification system. And hence using this simple & efficient method, we can track the location of staff/student by just staying in a particular place and without wasting human power & time. With the help of IOT gecko we can add extra automation in it

#### V. CONCLUSION

RFID technology evolution with respect to RFID applications. RFID applications could reduce the number of errors by tagging an individual and by tracking the location in a timely manner. RFID based timely information about the location of a person would increase the efficiency and effectiveness of the tracking system. RFID technology will open new doors to organizations & companies to make them more secure, reliable, and accurate. The system should enable the integration and optimization of resources while improving accuracy and minimizing time leading to improvements in tracking the location. In future this idea, which is beneficial to both the student and the staff, can be done in large scale, depending upon its effective implementation as it shows in the seeds to develop various real projects.

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