ABSTRACT

Internet of Things (IOT) plays a key role in connecting the surrounding wireless things to the system and made easy to access information from remote location. The researches and implementations are currently on -board in all the respective areas. The study based on efficient real time traffic congestion enable us to design a Smart Parking and Advanced Booking System(SPABS) to find the nearest parking area and gives availability of parking slots. It mainly focus on reducing the time in finding the parking lots and also it avoids the unnecessary travelling through filled parking lots in a parking area and reduces the fuel consumption.

The existing parking system which uses video sensors and cameras to collect the real-time information. But these parking system are expensive and utilizing more bandwidth. In consideration with cost and performance, our project embedded-wireless sensor based system called Smart Parking and Automatic Booking System(SPABS) is to detect the empty parking spaces and sends this data to users. In this system user will send a request to the server of their choice. The central database will send a request to embedded system, for availability of parking slot.. The user will access the confirm request provided by the server. The information also include terms and condition where in, the booking will be cancelled, if the user did not turn up within the given time slot.

The user can access the allotted parking slot through his smart card, in order to avoid illegal activities. By swiping the smart card the system or the server will match the user ID, if it is matched the user will be allowed for parking. The project is also interested in extending the generating the parking bill to the user.

INTRODUCTION

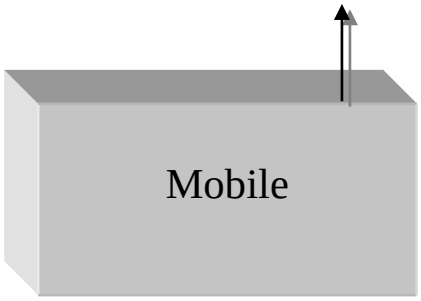
IOT technology grows in various fields of smart applications but we have not yet found boundary constraints of this technology. Some smart applications which it has implementing currently such as on smart grids, smart lighting, smart energy, smart city, smart health etc.

This is broadly classified into three categories such as sensing, processing and connectivity. Whereas sensing includes sensing the speed of vehicles and humans or any objects (accelerometer), sensing of temperature, pressure etc. And these can be processing by using some processors such as network processor, hybrid processor MCU/MPU etc. The devices are connected by using some technologies called GPS, Wi-Fi, BT/BTLE, RFID etc.

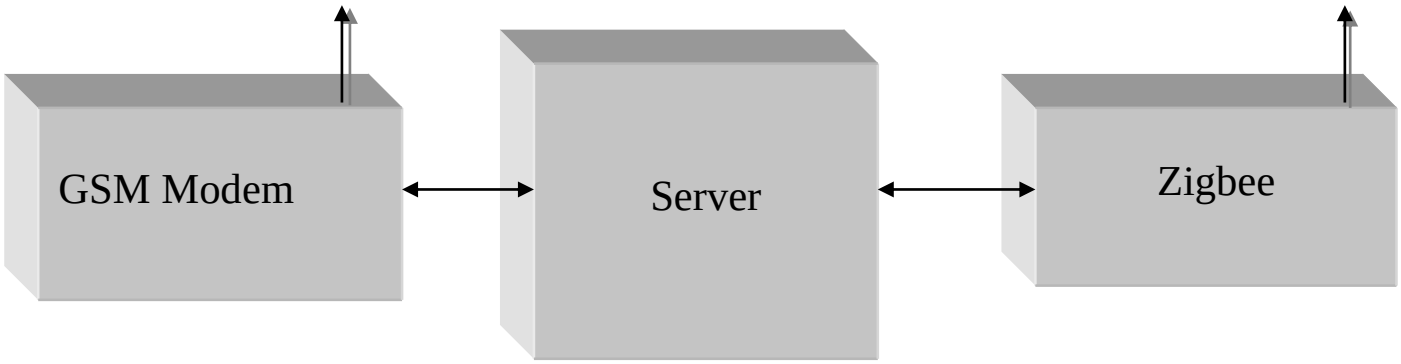
More than half of the world's people are living in the cities. So the cities have reached full of its occupancy. As people uses vehicles for transportation so there is large number of vehicles exists for people convenience. Most of the time people spend their precise time on searching parking lots to park their vehicles. Thus congestion occurs in the traffic it leads to a hectic job to find the parking space to park their vehicle. The most traffic occurs only because of vehicle congestion in the urban areas thus people are wasting time in searching the parking area abnormally to park their vehicles.

BLOCK DIAGRAM

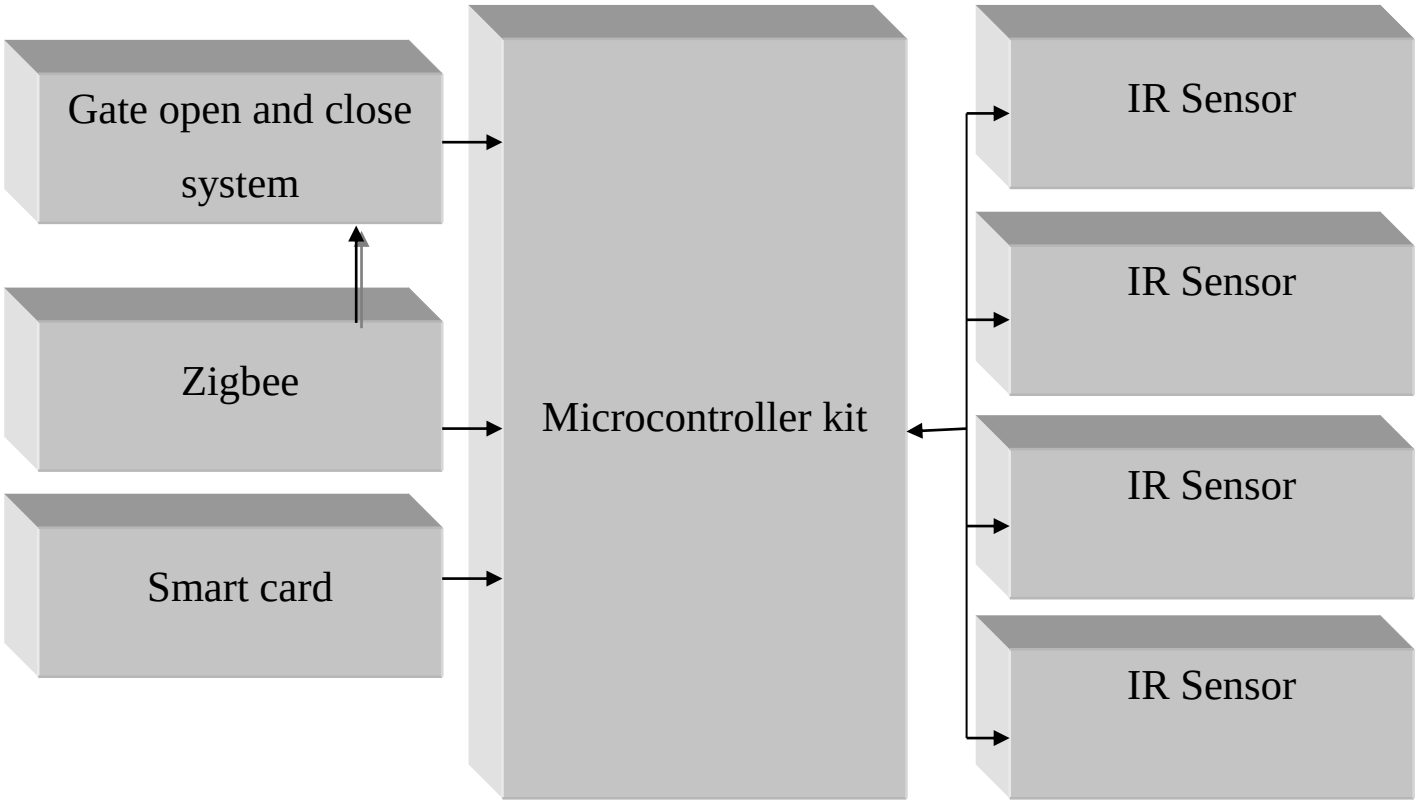
1. **User Part:-**



2. **Server Part:-**



3. Embedded part in parking slots:-



METHODOLOGY

In SPABS advanced parking system we have three layers. First layer is location controlled embedded system it consist of ARM based microcontroller to perform ground level operation. To identify the slot availability by using IR sensor and the security purpose the RFID based gate control system is enabled.

The second layer is server, it virtualizes the slot site and creates a data base of filed slots booked slot and free slots and keep track of timing for arrival and canceling of booking.

The server is main base of user end application is the third layer it request server to access the virtual site map and allows to book the slot as per user need.

HARDWARE DISCRIPTION

1. MOBILE:- This is the user's interface.

Wherein, an application is installed or used by the user to access and book the parking slot at a preferred location. A message will be triggered to the server for booking request and by using the GSM modem which is pre-installed in the mobile.

2. GSM MODEM:-GSM stands for

Global **S**ystem for **M**obile Communications. GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. Here, GSM modem is used in 2 places to trigger message:

   a) Mobile.
   b) Server.

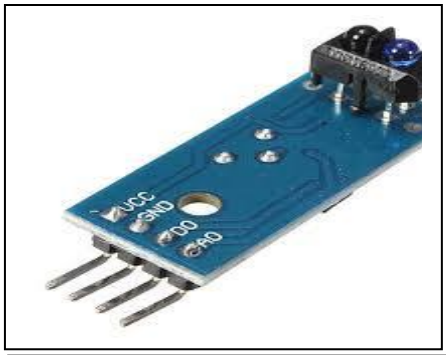
3. GATE OPEN AND CLOSE SYSTEM:- It is a gateway provided for the user. The gate opens only when the user swipes the smart card and is verified with the server booking id details .

4. SERVER :- A server is a computer program

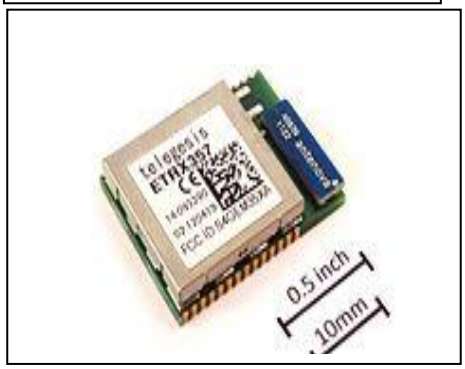
or a machine that waits for requests from other machines or software (user's) and responds to them. A server typically processes data . The purpose of a server here is it to accept the request from the user and to give response to the user. The response to the user is given by making a communication with the embedded system and accessing the data of it.

5. SMART CARD:-A smart card is a device that includes an embedded integrated circuit chip (ICC) that can be either a secure microcontroller or equivalent intelligence with internal memory or a memory chip alone. Here it is used by the user to accesses the gate at the parking slot for security purpose and identity verification.

6. IR SENSOR:-An infrared camera or thermal imaging camera is a device that forms an image using infrared ration, similar to a common camera that forms an image using visible light



7. ZIGBEE:-ZigBee is an IEEE 802.15.4-based specification for a suite of high-level communication protocols used to create personal area networks with small, low-power digital radios. Applications include wireless light



switches, electrical meters with in-home-displays, traffic management systems. Here it is connected to both server and the micro controller.

ADVANTAGES

1) It saves time for the user, where user was searching for the parking slot and parking the vehicle .
2) This is more secured system where we use smart card for accessing the parking slot .
3) As the system provides Gate open and closed security module , and booking charges are carried out on online banking, it saves lot of manual labor work required.

DISADVANTAGES

1) As everything is online they required for internet in the phone for the user to access the application.
2) The server should be maintained well and near are above the user traffic otherwise server breakdown occurs mobile applications will be blocked.
3) The user should come to parking slot within the given time otherwise his/her booking request will be cancelled by the server.

CONCLUSION

This designed automatic smart parking system which is simple, economic and provides effective solution to reduce carbon footprints in the atmosphere. It is well managed to access and map the status of parking slots from any remote location through web browser. Thus it reduces the risk of finding the parking slots in any parking area and also it eliminates unnecessary travelling of vehicles across the filled parking slots in a city. So it reduces time and it is cost effective also.

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