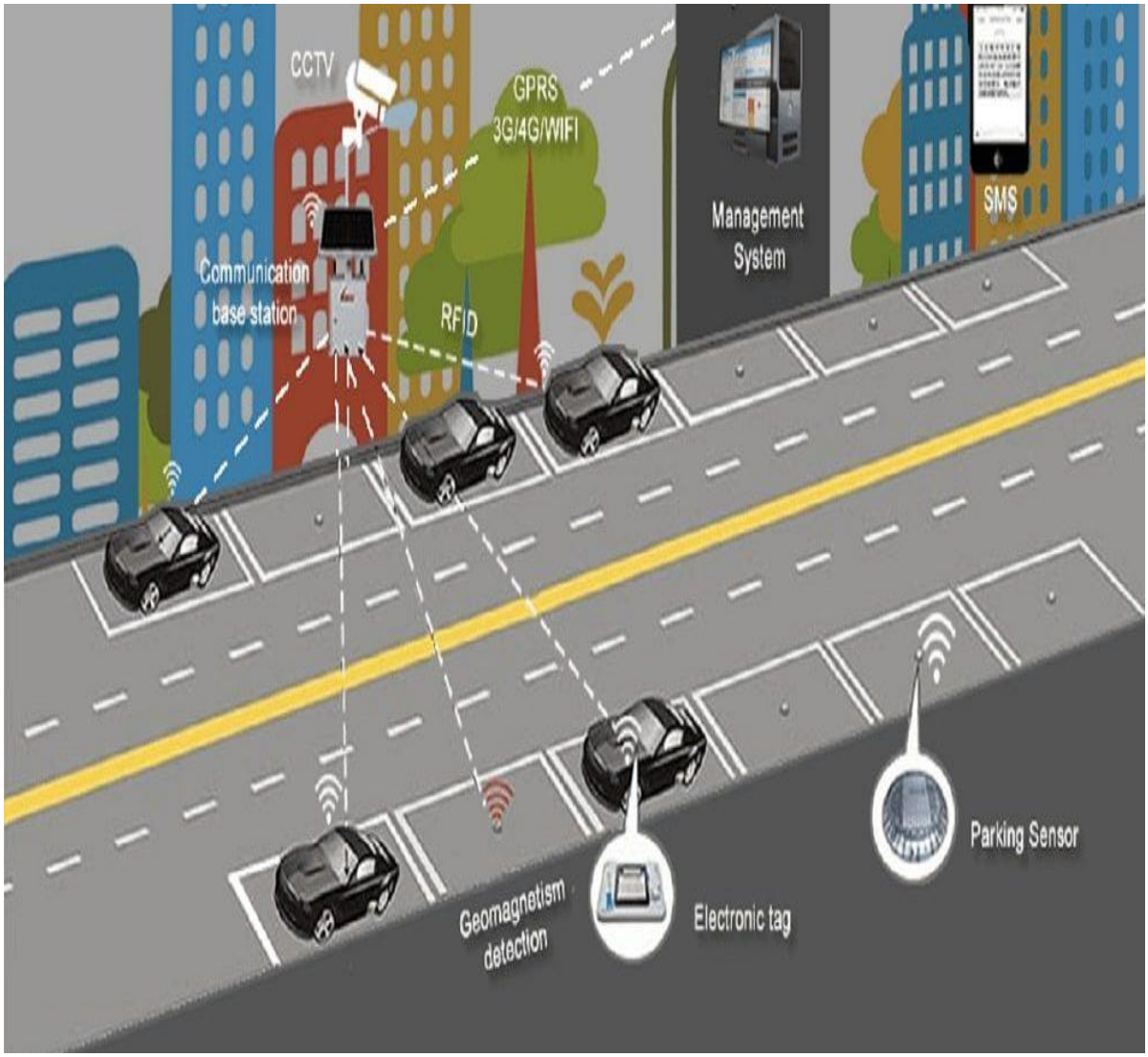
IoT Based Smart Parking Systems



ABSTRACT: Nowadays congestion of traffic level increases with the increasing development of population rapidly. With respect to the amount of population, the utilization of personal vehicles also increased. Due to more use of cars the traffic congestion occurred on the road. Most of the people chooses personal vehicles than public transportation. It is very difficult and time consuming to find parking space in most metropolitan areas, commercial areas, especially during the rush hours. It is often costly in almost every big city in all over the world to find proper and secure parking space. The proposed project is a smart parking system that delivers information to people finding a parking space online. It overcomes unnecessary time consuming for finding the problem of parking space in parking areas. Hence, the website is provided by this project based system where users can view various parking areas and choose the space from available slots.

INTRODUCTION : The recent growth in economy and due to the availability of low price cars in the market, an every average middle-class individual can afford a car, which is good thing, however the consequences of heavy traffic jams, pollution, less availability of roads and spot to drive the motor car. One of the important concerns, which is to be taken in accounting, is that problem of parking those vehicles .Though, if there is space for parking the vehicle but so much time is squandered in finding that exact parking slot resulting in more fuel intake and not also environment friendly. It will be great deal if in some way we find out that the parking itself can provide the precise vacant position of parking slot then it'll be helpful not limited to the drivers also for the environment.

MOTIVATION OF THIS PROJECT: The main motivation of this project is to reduce the traffic jam that occurs in the urban areas which are caused by vehicles searching for parking. In the newspapers, we saw many articles regarding the parking problem all over Dhaka City. In Bangladesh we are still using the manual vehicle parking system that why we are facing problems like wastage of time and energy finding free space across the parking surface when we need to park our car which requires a good amount of fuel. We proposed an automated system where the parking ground will only open if it has free slots for parking. The user can also check it before arriving there by a website. It will save the time as well as reduce the gathering in front of parking area.

WORKING PRINCIPLE: Arduino is the brain for the whole system. It controls and watches over all the components. The ultrasonic sensors will be placed in the parking slots that will encounter the presence of the cars inside the parking slots. One sensor will be placed beside the main entrance of the parking lot. As soon as the sensors get the presence of a car in front of the entrance, it will send signal to the Arduino chip to check if there is an empty slot inside the parking lot. When Arduino chip acknowledges that there is an empty slot or more then it will send signal to the dc servo motor which will open the main entrance. On the other hand if Arduino chip encounter no empty slots at the time of a car trying to make entrance, the gate will just not open. In addition, there will be a website linked with the Arduino board to show the number of parking slots remaining empty. The Ethernet shield can be placed on the Arduino circuit board. A 9v dc battery will provide power to the circuit. The connection between an ultrasonic sensor & Arduino board will be provided through 3 wire and the dc servo motor can be operated through 2 connections. Pin configuration of the Arduino circuit board will be done through the simple programming language which will be written and implemented through the Arduino IDE.

Problem Statement: In recent research in metropolitan cities the parking management problem can beviewed from various angles such as high vehicle density on roads. This results inannoying issues for the drivers to park their vehicles as it is very difficult to find aparking slot.The drivers usually waste time and effort in finding parking space and end up parkingtheir vehicles finding a space on the street which further leads to space congestion. Inworst case, people fail to find any parking space especially during peak hours andfestive season.

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Smart Parking Solution: One of the most talked-about innovations that have come up in the parking space is Smart Parking Solutions. These are IoT run devices that give out a signal on the availability of parking slots. These devices are fixed on each parking slot from where the signals are directly sent to the nearby receiver which in turn gives continuous updates on the availability of all the slots. The data then gets sent to the parking guidance system and apps available on the mobile platform. Not only that, but the users of these apps also get to know the size of the parking space and also nearby available public transportation.

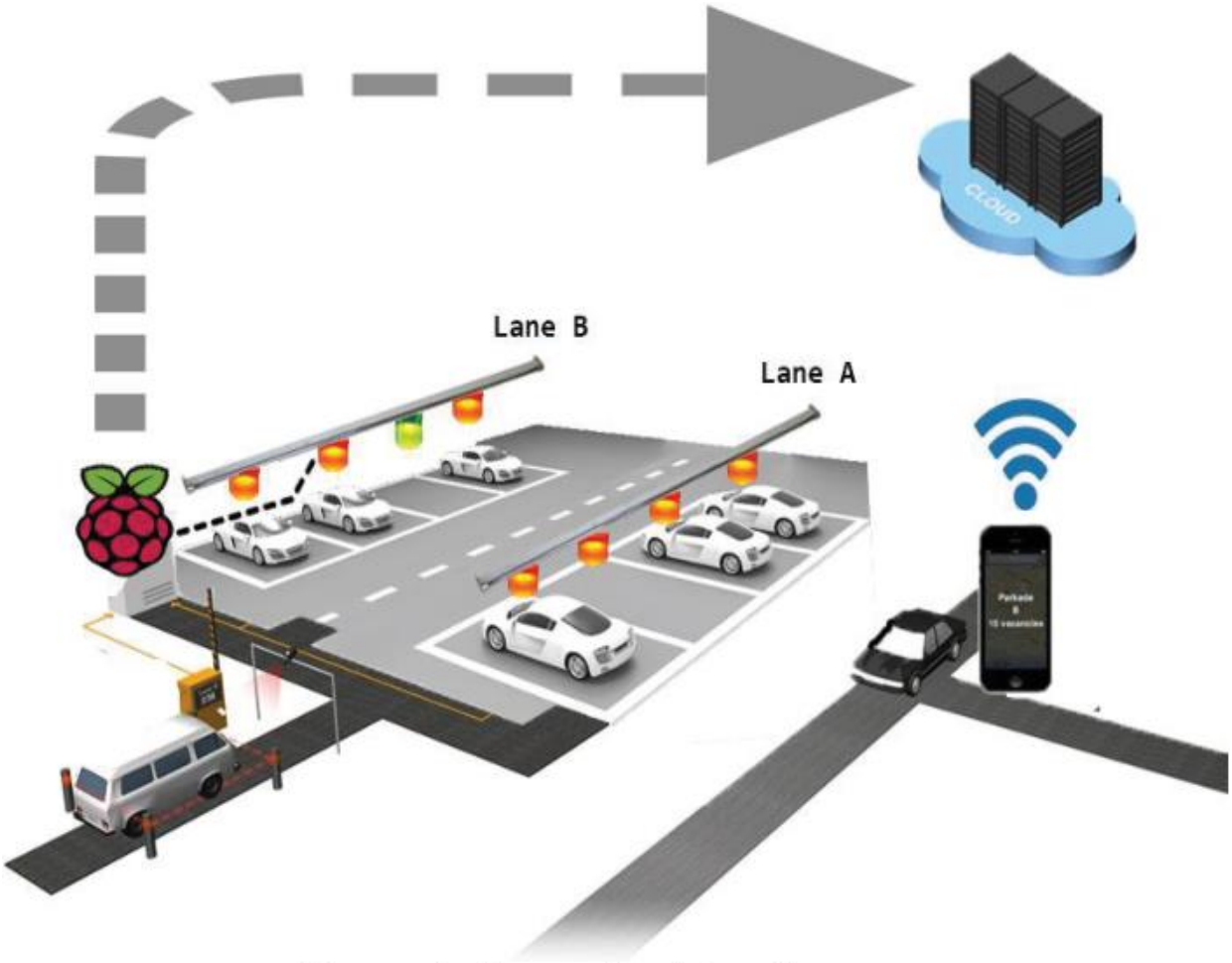

Figure 1: Smart Parking System

CONCLUSION: After doing study on smart parking project it is found that this system can be introduced in our country and it will be beneficiary in the context of our country. The main benefits are time and fuel saving. It can also provide sustainable parking management in an eco-friendly manner. There is less maintenance cost for this system so it is helps the property developer in cost saving. It provides security to the parking ground. It reduces the hassle in parking grounds and traffic jam. It will also encourage Automation Engineering in our country which will make advancement in increasing usage of technology. Therefore, we should implement this project and help to develop our city.