CHAPTER 1

INTRODUCTION

Due to the increasing number of vehicles caused by rapid population growth in urban areas, the demand on parking infrastructure for the general public has increased significantly Polycarpou et al.[1], points out, finding a free parking space in urban cities especially during peak hours is more or less impossible, in many cases.

Looking for a vacant parking lot in a busy city like Bangalore, at a peak hour is a nightmare to drivers. They have to drive around looking for a free parking spot, something that is believed to increase traffic congestion by Chinrungrueng et al.[2]. In Srikan Geng et al.[3] the cycling around not only frustrates drivers but also increases the average consumption of gas and hence the air pollution that effect the environment. It is also believed that, as drivers' attention is partly on looking for a free spot in a busy city, the likelihood of causing an accident is higher. Another challenge is associated with paying for the parking, most of the time, the machines from which to get the payment ticket are located some distance from the car. The ticket machines too, present some complications since they are not the same, some machines take only coins, or coins plus credit/debit cards or only credit/debit cards. The situations looks like drivers have to prepare for the possibility of any of the above type of ticket machines.

1.1 PROBLEM STATEMENT

- With increase in the population, number of vehicles increase and due to unmanaged parking it leads to many problems.
- In center cities, people faces difficulties as increasing number of vehicles creates congestion, wastage of space vandalism and many other difficulties.

1.2 OBJECTIVES

The objectives of our proposed project work is

- To study how challenging it is to find parking space in area in comparison to what research works have pointed out for other urban cities
- To provide solution to manage parking problems in the city (Parking management system)
- To provide the parking facility occupancy information to drivers and other systems.
- To minimize fuel consumption

CHAPTER 2

LITERATURE REVIEW

Anthony Mwabaze [4] represents intelligent parking system based on wireless sensor network technology using (CCTVs) which will be used as a sensing node to identify vacant parking space. The captured image will be processed through the AVR Microcontroller and the processed data will be transmitted via ZigBee to a central computer to store and update the occupancy states of available parking space vacancies in the database. Describes Rotary Automated Car Parking System. Cars are first placed onto motorized mono-directional or Bi-directional platforms and then transferred to the nearest available parking space. All operation are PLC-Controller.

Shietan B.Dhoti [5] proposed the concept of micro controller based car parking system in which micro controller senses the moment of cars and open the gate in vacancy available and security is provided by using RFID module through RFID card and displays the information to LCD.IR sensor identify entry and exit of car.

Ramnett kaur and Balwinder Singh [6] purposed FPGA based parking system .when a vehicle enters in the parking lot, LCD display if the space is available then the door opens for vehicle entrance .RF module is used to transmit and received slot availability information .Host computer acts as control unit. Once host computer program the FPGA, Identification and slot checking modules activate.

Zishan Razz et al.[7], proposed web app system, named " Park Easy" which is based on the usage of smart phones, sensors monitoring techniques with a camera which is used as a sensor to take photos to show the occupancy of cars parks.

CHAPTER 3

METHODOLOGY

The smart parking system to be developed has four actors whose needs the system must satisfy. The primary actors of the system include car drivers, system administrators, parking enforcement officers, and the city planning authority. Figure 1 shows the use case diagram of the system highlighting the actors and their actions

The secondary actors include the payment processing system and the parking permit issuing system. The Driver has to Register. during that process the vehicle's details are asked and some credit has to be load to the created account. The Payment Processor the external system is used to process the payment. The driver checks for available empty parking spaces in the part of the city before driving there. The check free(empty) parking space depends on the Occupancy Prediction engine which includes the execution of Car positioning algorithms. When a driver finds a parking space, the driver wants to Pay parking fee which action requires the system to Check Credit balance to cover the parking fee due. The driver furthermore wants to Get Electronic parking permit, this action invokes the Permit Issuer an external system that manages the issuance of parking permit.

The Admin, just like the driver, both have to Login/Logout and the system must verify that they are who they claim to be using User Authentication engine. The system admin also wants to Manage User Accounts in case of a problem or during routine maintenance of the system. The Enforcement officer wants to get information about parked Cars which tells if a car has a parking permit or if it has the parking even turning at the end of which the parking fee would be paid. The City Authority want to Get Parking Analytics to predict the parking behaviors of the drivers in the city to aid their city planning. This action involving the Pattern recognition engine that looks for patterns and correlations between different data set of parking events and occupancy.

The problems this project is addressing needs an aggregation of data and information from different sources, but these sources must be connected to the internet to make that data accessible. The sharing and utilization of data between interconnected data sources, through the internet, shares similar characteristics to the concept known as The Internet of Things (IoT). This chapter presents some contributions towards the IoT, with anticipations that inspirations towards this project could be gained from what is already done for IoT.

Some of the IoT architectures, standards, radio technologies and web technologies that are considered relevant to the execution of this project are briefly introduced.

The Internet of Things is a paradigm referring to the interconnection of physical objects (Things), people, virtual data and environment that allows them to interact at will (Framling et al., 2014; Al-Fagih et al.,2013). The physical objects are equipped with hardware and software that permits them to collect and exchange data and/or execute control commands to drive actuators.

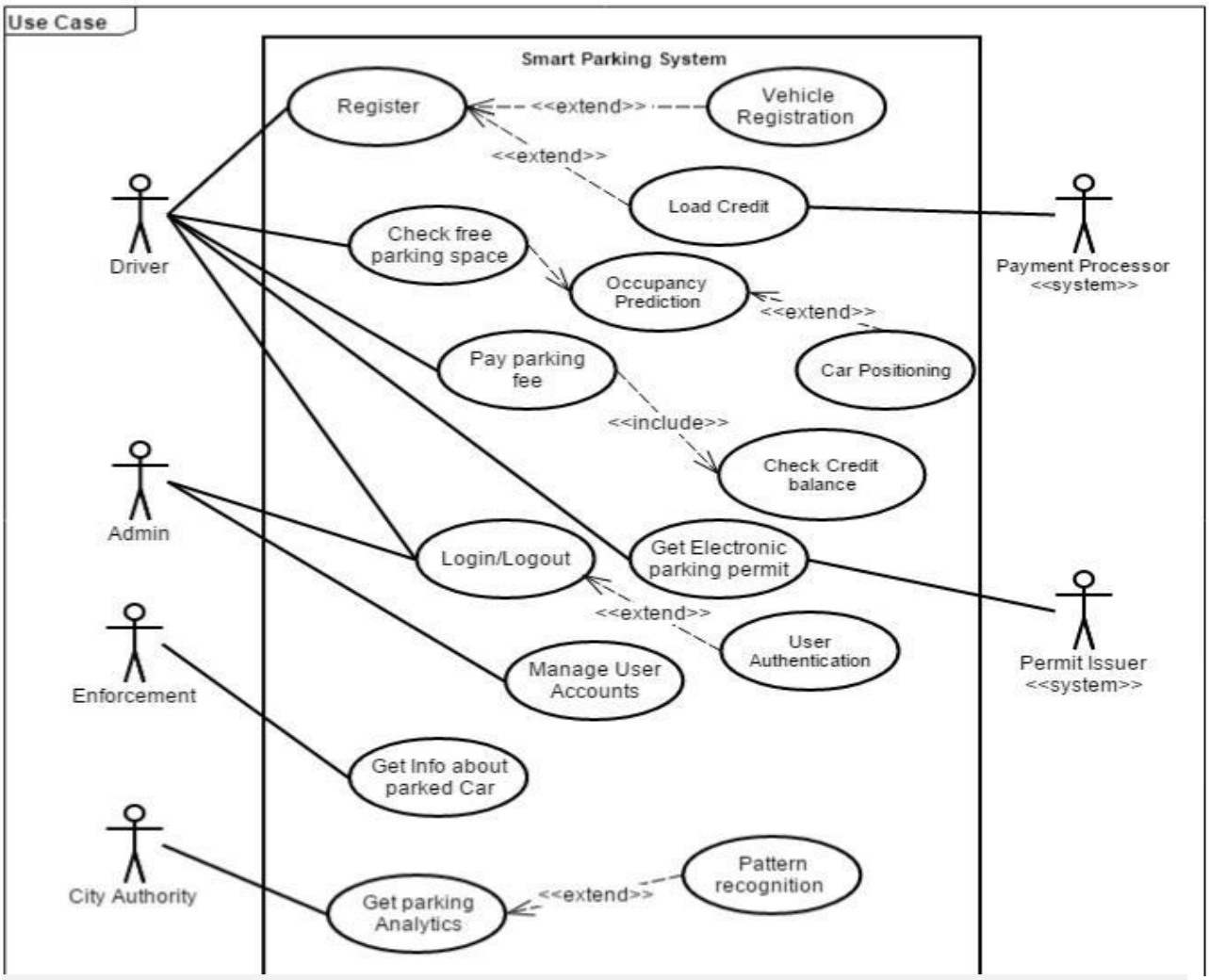

Figure 1: The use case diagram for the smart parking system