CHAPTER ONE

INTRODUCTION

1.1 Preface

The automated parking management system has existed for a long time, but is only now finding mass demand for the efficient and effective parking solution. The demand for parking is constantly increasing while the space for large parking lots is decreasing. As a result, automated parking management systems have filled the void by parking more cars in less space and improving profitability, safety, environment considerations and all related expenses. With this in mind, knowing the background of the parking garage can be an interesting topic. Throughout these years, developments and design changes were made to continually improve the automated car park [1].

The traffic generated by cars searching for parking spaces takes up to 40% of the total traffic. The systems are not smart enough, because they cannot successfully help drivers find a desired parking space in crowded areas, and sometimes make the situation worse. For example, if available spaces in a congested area are less than the spaces in demand, more drivers trying to park will head for the limited available spaces, causing severer congestion. In this case, detailed information associated with parking availability would allow drivers to make better decisions on use of parking lots and road-side parking [2].

One of the biggest problems people face today when we visit various public places like Shopping malls, 5-star and 7-star hotels, multiplex

cinema halls, etc. The difficulty we encounter at these places is finding the availability of parking space.

The Rotary Automated Car Parking System (RACPS) belongs to the class of rotary smart car parking systems. This model is specifically designed to accommodate multiple cars in the horizontal space of two. This kind of equipment is useful to solve the issue of limited parking space available in busy cities. So the task was to design mechanical equipment that can store number of cars in one normal garage. It is called a rotary parking shaft. The idea is to park and move cars with no disturbance to the already parked cars in RACPS[4].

Their proposed system presents an Autonomous car parking that regulates the number of cars that can be parked in a given space at any given time based on the parking space availability.

1.2 Problem Statement

As it is known, the land is becoming less but the population of human is growing day by day. This scenario is very obvious in modern developed cities. Therefore, land is very limited and spaces need to be saved in every aspect of life.

Other than that, once the vehicles are in the car park, they will slow down to search for an empty parking space. This slow moving traffic will cause the queue of cars to be longer. Eventually, traffic jam will occur when the car park is crowded.

While the development of the country and nation is growing in a quick pace, crime rates are also increasing daily. Therefore, security has become one of the main concerns in everyday life of the society. Car park is also one of the places where individuals are attacked frequently.

1.3 Aim and Objectives

The main aim of this project is to design and implement an automated parking system. The main objectives of this project are:

1. To reduce parking and retrieval time. Saves time spend in searching for empty parking slots and time spend in searching the parked car.
2. To improved security, safety for the cars. Cars parked are free from theft and damages that can caused while parking and retrieving.
3. To minimize the area, a small area can contain large number of cars.
4. To prevent people from overcrowd.

1.4 Proposed Solution

All Automated Parking Systems (APSs) take advantage of a common concept to decrease the area of parking spaces - removing the driver and passengers from the car before it is parked. With APS, the car is driven up to an entry point to the APS and the driver and passengers exit the car. The car is then moved automatically to its parking space.

1.5 State Of The Art

Automated parking management systems have solved the problem by parking more cars in less space and improving profitability, safety environment consideration and all related expenses. The car is moved through and stored automatically in an open parked space. This done by utilizing computer controlled system. Later the car will be returned to the client using a signaling device outside the building.

CIMPLICITY system will generate maintenance and diagnostics reports to increase troubleshooting, efficiency and to enable a quick response when system problems occur.

The proposed Smart Parking is an intelligent parking system. Drivers can view and reserve a parking spot on the fly. The parking process can be a straightforward and non-stop process.

The state of the parking slot is detected by sensor node and is reported periodically to the embedded web-server via the deployed wireless sensor network. And this information is sent to central web-server using WIFI networks in real-time, and the vehicle driver can also find vacant parking lots using a mobile phone or a tablet.

Also connecting the automatic parking system to the internet and maps etc. The integration of things into Internet-services is often referred to with the term Internet of Things (IoT).

1.6 Methodology

In the Development of automated Parking System, we have chosen the simplest rendition of this system. It is called the “waterfall model”. The waterfall model is a sequential software development model (a process for the creation of software) in which development is seen as flowing steadily downwards (like a waterfall) through the phases of requirements analysis, design, implementation, testing (validation), integration, and maintenance. Below is the unmodified "waterfall model". Progress flows from the top to the bottom, like a waterfall.

In phase one**,** System Requirements Analysis All possible requirements of the Development of Smart Parking System to be developed are captured in this phase.

Second phase about System & Software Design in this phase, the software development process, the software's overall structure and its nuances are defined. In terms of the client/server technology, the number of

tiers needed for the package architecture, the database design, the data structure design is all defined in this phase.

In third phase, the design must be translated into a machine-readable form. The code generation step performs this task. If the design is performed in a detailed manner, code generation can be accomplished without much complication. Different high level programming languages like VB.NET and Microsoft SQL Server are used for coding. With respect to the type of application, the right programming language is chosen.
Finally, Verification has a fully working system, which demonstrates the objective of our project. This will be done in phases and each phase would be able to be tested independent of the other phases.

1.7 Thesis Layout

Chapter two explains the theoretical background in addition to the related works (as a casual observation). Chapter three illustrate the components and contents (hardware & software) in details. Chapter four discuss some points and present the results of simulation. Chapter five contains the final conclusion and future work (recommendation).