Course: Software Engineering I

Dr.Mohammed EL-Ramly

T.A: Manar Elkady

Project Name: Automated Garage System

Software Requirements Specifications

Initial Phase 1-(SRS)

Leader Name: Abdel-Aziz Sayed Abdel-Aziz

Leader Contacts:

E-mail: roab4stars@gmail.com

Mobile: 01121314551

CS251: Phase 1 – Garage Automated System

Software Requirements Specifications

Contents

CS251: Phase 1 – Garage Automated System

Software Requirements Specifications

Team

ID	Name	Email	Mobile
20120235	Abdel-Aziz Sayed Abdel-Aziz	roab4stars@gmail.com	01121314551
20120234	Abdelrahman Mostafa Elattar	abdelrahman.ols@hotmail.com	01004756251
20120240	Essam Mohammed Omar	essamomar94@hotmail.com	01288806646

Document Purpose and Audience

- **The purpose of this SRS software requirements specification (SRS) is to determine the scope of this project and clarify any definitions, acronyms or abbreviations. It also establishes the major requirements necessary to develop an automated garage system.**
- **This document is intended to be reviewed by client, developers, designers and project manager.**

Introduction

Software Purpose

- **The purpose of this project is to track and manage occupancy of a parking garage automatically using software systems and devices that allow customers to find and reserve available parking places.**

Software Scope

This software is composed of the following components:

- **Garage Access Control: Detects and controls vehicles that drives up on to the lift and those that leaves the garage.**
- **Occupancy Monitoring: Monitors the parking spots availability in the different parking decks.**
- **The registration software: Manage customers' registration and reservations.**
- **Administration: allows manager to view monthly reports and information.**

Software Requirements Specifications

Definitions, acronyms, and abbreviations

Term	Definition
License-plate readers	uses digital cameras and a license-plate recognition system to identify license-plates.
Passenger vehicles	are those who can be parked in this parking garage. That is, large trucks, busses, etc., cannot enter this parking garage.
A Lift Platform/ Vehicle elevator	is used to lift passenger vehicles between decks levels.
Parking spot	is a place where a vehicle can be parked.
Sensor	is a smart device that is capable sense the occupancy of the spot by a vehicle.
Registered/Non-Registered Customers	Registered customers have access to the upper decks whereas the non-registers have access to the ground level only.
Guaranteed reservations	allow customers to make a (monthly) contract with the parking garage for a parking spot. Such customers are desirable because they can provide predictable and steady income.
Cancelled Reservation	Is a reservation that's cancelled by the customer at least 1 hour prior to his reservation.
Penalty charges	Is an amount of money paid by a customer when he cancels a reservation within the unacceptable time (less than 1 hour to the reservation time).
Back up	Is to save a copy of daily reports at least once a day, to prepare for any natural or human-induced disasters that may occur.

CS251: Phase 1 – Garage Automated System

Software Requirements Specifications

Requirements

Functional Requirements

- **1. Garage Access Control**
  - **1.1. The license-plate reader reads the plate-number of a car and gets its reservation number when a car drives up on to the lift/or when the car leaves the garage through the exit pathway [complexity 3].**

- **2. Occupancy Monitoring**
  - **2.1. The sensor senses the occupancy of a parking spot by a car. [complexity 2]**
  - **2.2. The system indicates that all parking spots are occupied or there are some available parking spots[complexity 2]**

- **3. The registration software**
  - **3.1. Custom registers at the company website by entering his information, valid email, credit card and license plate numbers (the latter not required for users who don't own cars).[complexity 2]**
  - **3.2. The customer can make a reservation contract and has a guaranteed parking spot [complexity 3]**
  - **3.4. A registered customer cancels a reservation the system must verify that cancelation is done in more than one hour before the reservation time and prints 'the reservation has been cancelled' and prints 'the cancelation can't be done' otherwise. [complexity 2]**
  - **3.5. A registered customer chooses to edit his reservation and the system must verify that modification is done in more than one hour before the reservation time [complexity 2]**

- **4. Administration system**
  - **4.1. A manager logs in the system by entering his name and password. [complexity 2]**
  - **4.2. A manager view monthly reports/payroll information and the system shows these information to him.[complexity 3]**
  - **4.3. A manager change prices to change prices of parking spots. [complexity 2]**

Software Requirements Specifications

Non Functional Requirements

This section specifies the non-functional requirements required for the Automated Parking Garage System.

1. **Performance:**
   - **The parking system should be updated quickly by all the automatic transactions made.**

2. **Reliability**
   - **A registered customer may edit or cancel his reservation an hour before their reservation time to avoid any penalty charges.**
   - **The system save and backup reservations information once a day on a persistent storage and on an online server to make sure it couldn't be lost.**

3. **Security**
   - **The parking system must prevent other customers or unauthorized users to access or be able to edit a customer's account details or reservations.**

4. **Usability**
   - **The parking system user interface should be very simple to allow its users and administrators to interact with it easily**

5. **Accuracy**
   - **The license-plate reader must use digital camera and license-plate recognition system that are qualified enough to get 100% accurate numbers.**

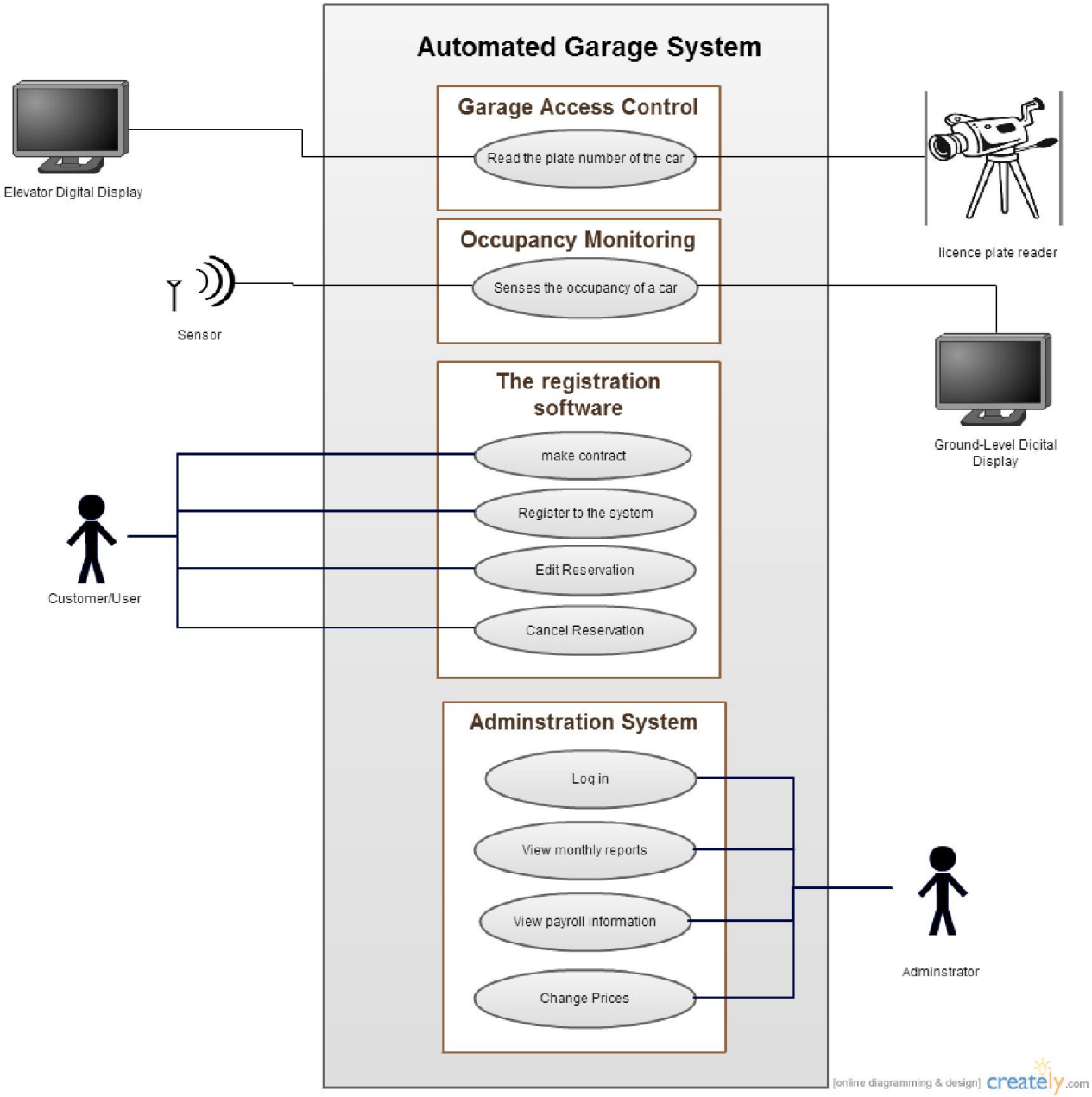
6. **Maintainability**
   - **The Parking system mustn't need more than 3 hours of weekly maintenance.**

7. **Environmental**
   - **The Parking system mustn't cause physical harm to users and non-users for example: the system shouldn't tell a user to park in an already occupied spot or park in somewhere in the main garage's pathway.**

Software Requirements Specifications

System Models

Use Case Model



Software Requirements Specifications

Use Case Tables

Use Case ID:	1	
Use Case Name:	Reading the plate number of the car [Garage Access control]	
Actors:	The license-plate reader (Camera) , Elevator digital-display	
Pre-conditions:	The user drives up the lift or leaves through the exit pathway and the user should be registered to the system	
Post-conditions:	The system gets and record the reservation number of the car	
Flow of events:	**User Action**	**System Action**
	1- If the registered user drives up the lift.	
		2- System Verify the license number and gets its reservation number and print the reservation info to the user through the elevator digital display
	3- if the non-registered user drives up the lift.	
		4- The system prints “denied access to upper decks” through the elevator digital display
	5- if the registered user drives down through the exit pathway	
		6- the system removes the reservation of the departing car

Software Requirements Specifications

Use Case ID:	2	
Use Case Name:	Sensing the occupancy of a car	
Actors:	Sensors, ground floor digital display	
Pre-conditions:	The system may have/don't have available parking spots. The user can be a non-registered walk-in.	
Post-conditions:	The ground level parking area has available parking spots/or full	
Flow of events:	**User Action**	**System Action**
	1- If a user parks in a parking spot	
		2- System indicates that the number of the available parking spots has increased through the ground floor digital display
	3- If a user leaves a parking spot	
		4-System indicates that the number of the available parking spots has decreased or the floor is full through the ground floor digital display

Use Case ID:	3	
Use Case Name:	The registration software.	
Actors:	Registered customer	
Pre-conditions:	The user must open the website to register or to edit a reservation	
Post-conditions:	The customer is registered and can edit, cancel reservations and make contracts	
Flow of events:	**User Action**	**System Action**
	1- Open the website and register with	

	his information.	
		2- System Verify registered user data
	3- The user choose to edit his reservation and re-enter some data	
		4- System verify the new data and change the old ones
	5- The user could cancel a reservation.	
		6- System cancels the reservation and delete the reservation data.
	7- The user choose to make a contract	
		8- the system considers the contract and stores its information
Exceptions:		
Includes:	-	
Notes and Issues:	-	

Software Requirements Specifications

Use Case ID:	4	
Use Case Name:	Administration System	
Actors:	Administrator	
Pre-conditions:	The administrator is connected to the system and logged in.	
Post-conditions:	Administrator gets some info about the system's data	
Flow of events:	**User Action**	**System Action**
	1- Administrator chooses to view daily reports	
		2- System views daily reports.
	3- Administrator chooses to view payroll information	
		4- System views payroll information
	5- Manager chooses to change prices	
		6- System change prices of parking spots.
Exceptions:		
Includes:		
Notes and Issues:		

CS251: Phase 1 – Garage Automated System

Software Requirements Specifications

Ownership Report

Item	Owners
Introduction, purpose, Glossery, Scope	*All members*
Functional requirements : Garage Access Control and its use case tables	*Essam Mohammed, with slight modifications of Abdel-Aziz Sayed*
Functional requiremetns : Monitoring Occupancy and its use case tables	*Abdel-Aziz Sayed*
Functional requiremetns : Registration System and its use case tables	*Abdelrahman el Attar*
Functional requiremetns : Administration System and its use case tables	*Essam Mohammed*
Non-Functional requirements	*Mainly By Abdelrahman el Attar with some slight modifications of the others*
Use case diagram	*Mainly by Abdel-Aziz Sayed with the help of the others*