Requirements **A**nalysis and **S**pecification **D**ocument

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Chapter 1

Introduction

1.1 Purpose

This is the Requirements Analysis and Specification Document to be used in the design of the software system called *myTaxiService*. In this document we describe the specifications and constraints that the software we are to implement must have. The intended audience of this paper is:

- The project manager
- The client which in this case is the Government of the city
- The designers and developers of the application
- The testing team
- The end user

This document has contractual value.

1.2 Scope

Here we summarize the main scope of the application.
The client is the *government of a large city*.
This city already offers a taxi service to its citizens, but the government wants to improve it using a modern and efficient information system.
So we received the request to design and implement this application, called *myTaxiService* which has basically two great objectives:

- Simplify the usage of the taxi service
- Guarantee an efficient management of the taxi queues

1.2.1 Users and interfaces of the application

The system is designed to interact with two kind of users:

- The clients (Passengers) of the Taxi service

- The taxi drivers

For each category of users we must provide an appropriate interface and the client requests for the interfaces are:

- A web application or a mobile application for the clients (Passengers)
- A mobile application for the Taxi Drivers

Moreover, it is required to implement a software interface for the developers of the system that manages to simplify the extension of the software with additional taxi services.

1.2.2 High level behavior

Here we report the exact description of the problem the government of the city supplied to us:

Passengers can request a taxi either through a web application or a mobile application. The system answers to the request by informing the passenger about the code of the incoming taxi and the waiting time.

Taxi drivers use a mobile application to inform the system about their availability and to confirm that they are going to take care of a certain request.

The system guarantees a fair management of taxi queues.
In particular the city is divided in taxi zones (approximately 2 km2 each). Each taxi zone is associated to a taxi queue.
The system automatically computes the distribution of taxi in the various taxi zones based on the GPS information it receives from each taxi. When a taxi is available, its identifier is stored in the taxi queue in the corresponding taxi zone. When a request arrives from a certain taxi zone, the system forwards it to the first taxi queuing (in the taxi queue) in that taxi zone. If the taxi confirms (the request), then the system will send a confirmation to the passenger. If not, then the system will forward the request to the second in the taxi queue and will, at the same time, move the first taxi in the last position in the taxi queue.

A passenger can reserve a taxi by specifying the origin and the destination of the ride. The reservation has to occur at least two hours before the ride. In this case, the system confirms the reservation to the passenger and allocates a taxi to the reservation 10 minutes before the meeting time with the passenger.

Beside the specific user interfaces for passengers and taxi drivers, the system offers also programmatic interfaces to enable the development of additional taxi service (e.g. taxi sharing) on top of the basic one.

1.3 Definitions

We present here the main glossary of the application domain, derived from the client specification already reported:

Term	Description
Government of the city	It is the client for which we are working. It desire an application for the improvement and simplification of the taxi service.
City	The ambient in which the taxi drivers and the passengers interact. It is divided in taxi zones.
GPS	Technology which manage to get in every moment the position of a vehicle
Mobile application	Is one of the interface that the passengers can use to interact with the system. To use it the passenger must have it installed in his smart phone.
Passenger	One of the user of the system. He can request a taxi service: he can request an immediate service or a reservation service for a future necessity
Programmatic interface	It is a software interface to be used by developers to modify and extend the actual software. It is useful for the extension of the application with additional taxi services
Queue management	It is an algorithm implemented in the system that permit to have a right distribution of the available taxi vehicles in the city territory. It must manage the organization of each taxi queues (one for taxi zone) in such way that in the entire city is served optimally
Request	It is the action carried on by the passenger when he needs to use the taxi service. It represents an immediate need of the passenger
Reservation	It is the action carried on by the passenger when he needs to use the taxi service in the future. It consists in the specification of the origin and the destination of the taxi ride, reserved for a desired time. The passenger can reserve a journey only if the specified date is at least two hours after the date of reservation.
System	It is the application we have to design. It is constituted by different interfaces: one for the Passengers, one for the Taxi Drivers and one for the future extension of the application (programmatic interface).
Taxi driver	One of the user of the system. They are the people which task is to drive the taxi. They use the application to communicate their availability or not and to be assigned to the taxi queues.
Taxi queue	It is an abstract queue of the available taxis in a taxi zone of the city. It has an order determined by the time in which each taxi driver communicate its availability to the system or by the decision of the taxi driver to take respond to a request or not
Taxi service	It is a service offered by the government of the large city which enable every person to use the offered taxis. It can be of different nature as a reservation service or a immediate service.
Taxi zone	The city is divided in taxi zones, each one having its taxi queue. The division is provided in order to distribute the taxi availability in all the city territory
Web application	Is one of the interfaces that the passengers can use to interact with the system. To use it the passenger must use a web browser.

Table 1.1: Glossary

1.4 References

- IEEE Std 830-1998: *IEEE Recommended Practice for Software Requirements Specifications*
- Assignment 1 document

1.5 Overview

In the next sessions of this document we will discuss about:

1. (Chapter 2) **Overall Description**
2. (Chapter 3) **Specific Requirements**

Chapter 2

Overall Description

2.1 Product perspective

2.2 Product functions

2.3 User characteristics

2.4 Constraints

2.5 Assumptions and dependencies

Chapter 3

Specific Requirements

3.1 External interface requirements

3.1.1 User interfaces

3.1.2 Hardware interfaces

3.1.3 Software interfaces

3.1.4 Communication interfaces

3.2 Functional requirements

3.2.1 User class 1

Functional requirement 1.1

3.2.2 User class 2

Functional requirement 2.1

3.3 Performance requirements

3.4 Design constraints

3.5 Software system attributes

3.6 Other requirements