

Politecnico di Milano

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Software Engineering 2 Project

“myTaxiService”

**Requirements Analysis and Specifications Document**

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1. **Introduction**

**1.1 Purpose**

This document represent the Requirement Analysis and Specification Document (RASD). The main goal of this document is to completely describe the system in terms of functional and non-functional requirements, analyze the need of the customer to modelling the system, show the constraints and the limit of the software and simulate the typical use cases that will occur after the development. This document is intended to all developer and programmer who have to implement the requirements, to system analyst who want to integrate other system with this one, and could be used as a contractual basis between the customer and the developer.

**1.2 Actual System**

I suppose that there is no actual system and, hence, the entire system requested is to be created without using or modifying a previous system.

**1.3 Scope**

The aim of the project is to create a system which will optimize the taxi service of a big city. The main goals of the application are to simplify the access of passenger to the service and to guarantee a fair management of taxi queues.

The system should be able to register new users with their personal information: name, surname and email. The system should be also able to keep track of every taxi driver in the city, dividing the city in “taxi zones” (of approximately 2 km²) and computing the position of every taxi in each zone thanks to the GPS position acquired from a web application provided to each taxi driver. Each zone is associated to a queue of taxi codes (one code is associated to one and only one taxi) in order to handle users requests. The system should also allow each taxi driver to confirm or decline a request from a user.

A user should be able to request a taxi and the system should notify the user if a taxi has confirmed the request and, in this case, the system should send to the user taxi code and waiting time.

The system should also manage taxi queues so that when a taxi request is received from a zone, the system forwards it at the first taxi in the queue associated to that zone; at this point, if the taxi confirms the request, a confirmation to the user is sent, otherwise – if the taxi decline – the system should forward the request to the taxi in the second position of the queue and move the taxi which declined in the last position of the queue.

The system should also provide some programmatic interfaces to allow the development of additional services on top of the basic system.

**1.4 Goals**

The system will have to provide the following features:

The user should be able to:

* [G1] Sign up into the system;
* [G2] Log-in into the system;
* [G3] Request a taxi;
* [G4] Be notified by the system about if the request has been confirmed or declined and – in case of request confirmation – be notified about taxi code and waiting time;

The Taxi driver should be able to:

* [G5] Log-in to the application through their web application;
* [G6] Inform the system about his availability;
* [G7] Receive user requests from the system;
* [G8] Confirm or decline users requests;

Moreover, the system should:

* [G9] Guarantee a fair management of taxi queues.

**1.5 Definitions, acronyms, and abbreviations**

In order to make the document more clear, in this paragraph some terms used in all the document are specified better.

* **Guest:** A person who hasn’t sign up to the application yet and, therefore, could only register to the application;
* **User:** A person who has successfully logged to the application and, hence, can use all the features of the application offered to users;
* **Taxi driver:** Driver of one of the taxis handled by the system;
* **Taxi management company (if not ambiguous, indicated as “company”):** Company which handles the taxi service of the city;
* **Taxi request (if not ambiguous, indicated as “request” or “user request”):** Indicates a taxi request performed by the user through the application;
* **Status (referred to taxi driver):** Indicates if the taxi driver is “Available” or “Unavailable”, as specified in the next point;
* **Availability: “available”/”unavailable” (referred to taxi driver):** Indicates if a taxi driver is “at work” and so could be considered a valid taxi to which the system can forward a user request;

A taxi driver can change his status to “Unavailable” when he can’t do his work for some reason (work breaks, damages, issues…)

* **Taxi answer (if not ambiguous, indicated as “answer”):** Is the answer of a taxi driver to a request, it can be “confirmed” or “declined” as specified in the next point;
* **Request confirmed (answer of a taxi driver to a user request forwarded by the system):** Indicates that the taxi driver is free from other tasks and can satisfy the user request;
* **Request declined (answer of a taxi driver to a user request forwarded by the system):** Indicates that the taxi driver is busy in another request and cannot take the user request in charge;
* **City zone (if not ambiguous, indicated as “zone”):** Slices in which the system divides the city in order to manage taxis as said in the scope paragraph. Every zone measures about 2 km²;
* **Zone queue (if not ambiguous, indicated as “queue”):** The queue in which taxis are placed. The zone queue is automatically created by the system in order to manage taxis, as said in the scope paragraph. The system creates one queue for any city zone;

**1.6 Identifying Actors**

* **Guest:** could only register to the application through a registration form or log-in to the application submitting his email address and password.
* **User**: A “Guest” turns into a registered user after a successful login to the application; since then he can request a taxi from his position using the application.
* **Taxi driver**: Drivers who drive taxis handled by the system.

**2 Overall description**

**2.1 Identifying Stakeholders**

My stakeholder is the professor who assigned me the project, asking me to focus on the entire development process of a complex enterprise application, which includes requirement analysis, design, testing and project reporting phases. The professor also said that the implementation phase doesn’t have to be performed and so I didn’t analyze it. I assume that the main objective of the project is to demonstrate the ability to follow all the phases of the whole software development process.

I can imagine that some hypothetical stakeholders for the system could be the members of a company which handles the taxi service of the city, people living in the city and taxi drivers who work in the city.

I can also suppose that discussions with stakeholders have been done and surveys have been submitted to the stakeholders have been submitted.

**2.2 Domain properties and assumptions**

Domain properties and assumption that I suppose hold in the domain:

* + A user gives correct information about his position when doing a request;
    - At the arriving of the taxi which will serve a user request, the user must take the ride;
      * When a taxi driver confirms a request he must go serve the request;
      * When a taxi driver confirms a request he begin to move immediately to serve the request, there is no time lapse between the confirmation and the departure of the taxi driver;
      * From the moment a taxi driver receives a request, he reaches the user location at most in 15 minutes;
        + All taxi drivers and corresponding taxi codes are registered into a database - or, more in general, in some data collection – from which the application can read, and the credentials are sent to every taxi driver by e-mail and post mail.

I also suppose that the list of taxi drivers and taxi codes is always correct and up to date, for example because some employees of the taxi management company take care about filling the database with taxi drivers and correspondent taxi codes and constantly update the database as new taxi drivers begin their work career;

* + - * + Position data about taxis sent by the GPS are always correct and available at any time to the system
        + Each taxi driver can run the mobile application (for example through a mobile support he owns) of the system, in order to send his position to the system and receive, confirm or deny user requests;
        + Each taxi driver, when is in the “available” status, can read the request, independently from the time requests arrive;