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Software Engineering 2: "*myTaxyService*"

Design **D**ocument

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Contents

1 Introduction

1.1 Purpose

This document presents the architecture on which *myTaxiService* will be developed; it describes the decisions taken during the design process and justifies them. The whole design process is described including also the improvements and modifications to provide additional valuable informations in case of future changes of the architecture structure.

1.2 Scope

Accordingly to the definition of the architecture design this document will focus on the non functional requirements of *myTaxiService*. Since the system architecture defines constraints on the implementation this document will be used to provide fundamental guidelines in the development phase of *myTaxiService*.

The system architecture will be organized in three categories corresponding to the functionalities of the different users: passengers, drivers and administrator.

- **Passengers**
  The system allows the user to sign up, login, request or reserve a taxi with the customization of the ride.
- **Taxi drivers**
  The system allows the user to login, set the "availability" and accept or reject jobs.
- **Administrator**
  The system allows the user to login, manage the drivers' list and supervise the system itself.

1.3 Definitions, Acronyms, Abbreviations

The following acronyms are used in this document:

- JEE: Java Enterprise Edition
- RASD: Requirements Analysis and Specification Document
- ER: Entity Relationship
- EIS: Enterprise Information System

The following definitions are used in this document:

1.4 Reference Documents

- Specification document: myTaxiService project
- Template for the Design Document
- IEEE Std 1016-2009 - IEEE Standard on Design Descriptions
- Requirements Analysis and Specification Document for *myTaxiService*

1.5 Document Structure

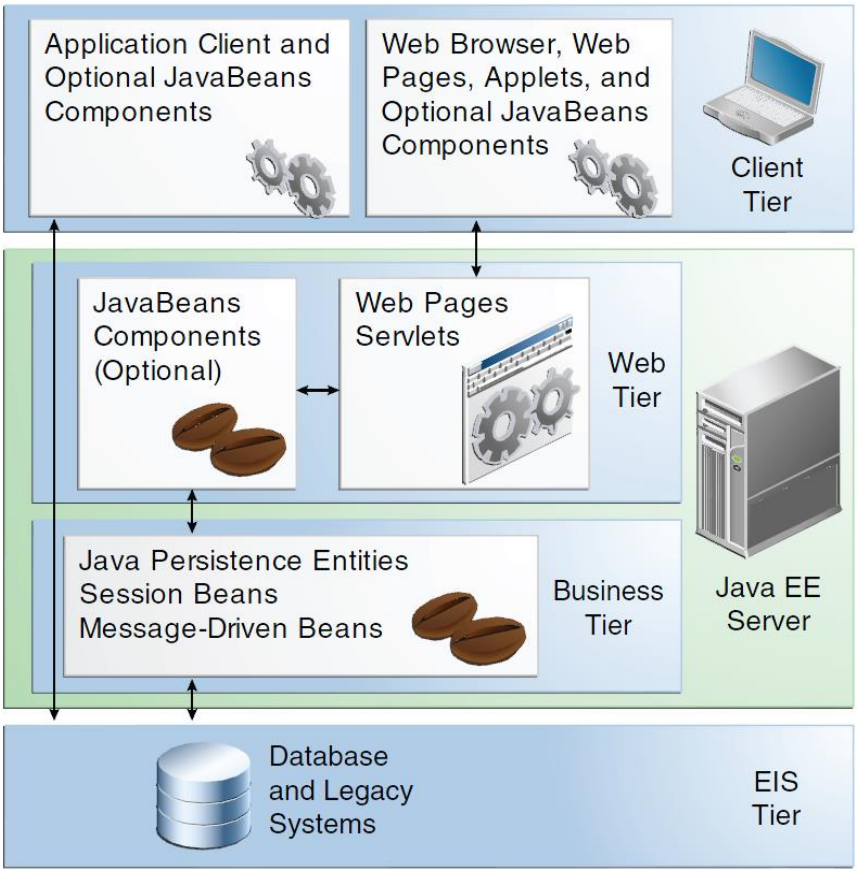
This document specifies the architecture of the system using different levels of detail. It also describes the architectural decisions and justifies them. The design was developed in a top-down way, then the document reflects this approach. The document is organized in the following sections:

1. Introduction
   Provides a synopsis of the architectural descriptions.
2. Architectural design
3. Algorithm design
4. User interface design
5. Requirements traceability
6. References

2 Architectural Design

2.1 Overview

This section of the design document provides a general description of the design of the system and its processes; it includes the general design context, the general approach and describes the overall design.
JEE has a four-tiered architecture divided as shown in the picture below:



1. **Client Tier**: contains Application Clients and Web Browsers and it is the layer designed to interact directly with the actors. This project is a web and mobile application, then the client will use a web browser or a smartphone to access pages.

2. **Web Tier**: contains the Servlets and Dynamic Web Pages that needs to be elaborated. This tier receives the requests from the client tier and forwards the pieces of data collected to the business tier waiting for processed data to be sent to the client tier, eventually formatted.

3. **Business Tier**: contains the Java Beans, which contain the business logic of the application, and Java Persistence Entities.

4. **EIS Tier**: contains the data source. In our case, it is the database allowed to store all the relevant data and to retrieve them.

We can also consider the second and third tier together, in this case the architecture becomes a three-tier one with *client tier*, *business logic tier* and *persistence tier*.
To design the system a top-down approach is used. After the identification of the main three layers, the system is decomposed in components that capture subsets of related functionalities. For each component is specified the role in the architecture and its interactions with the rest of the system.

2.2 High level components and their interaction

2.2.1 Identifying sub-systems

We separate the functionalities of our system into these functional areas:

- myTaxiService

  This component describes the system we were asked to implement.

- Users

  This component represents in general the users that will use the service.

- Notification service

  This component represents the notification mechanism our system will use (text-messages, emails and push notifications).

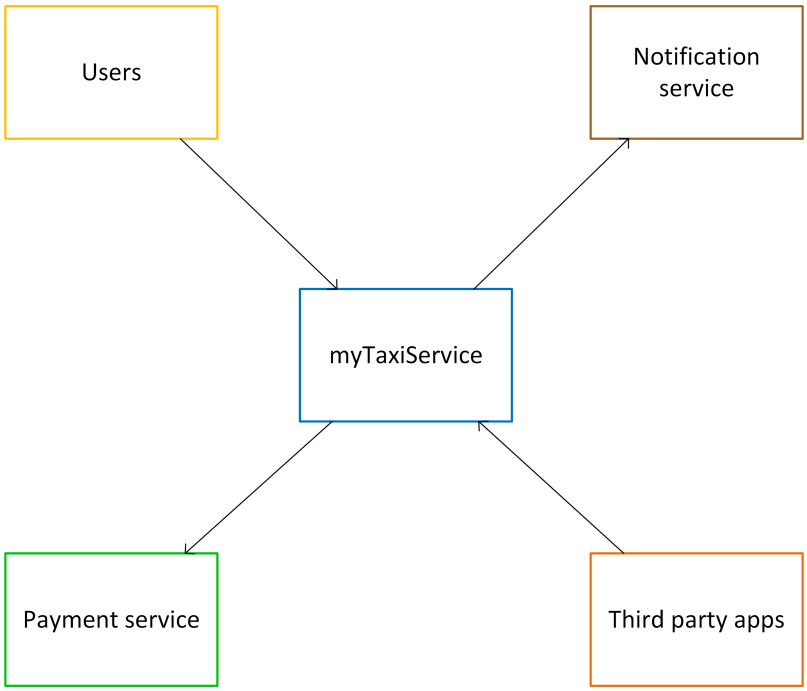
- Payment service

  This component represents the external service in charge of managing the payments.

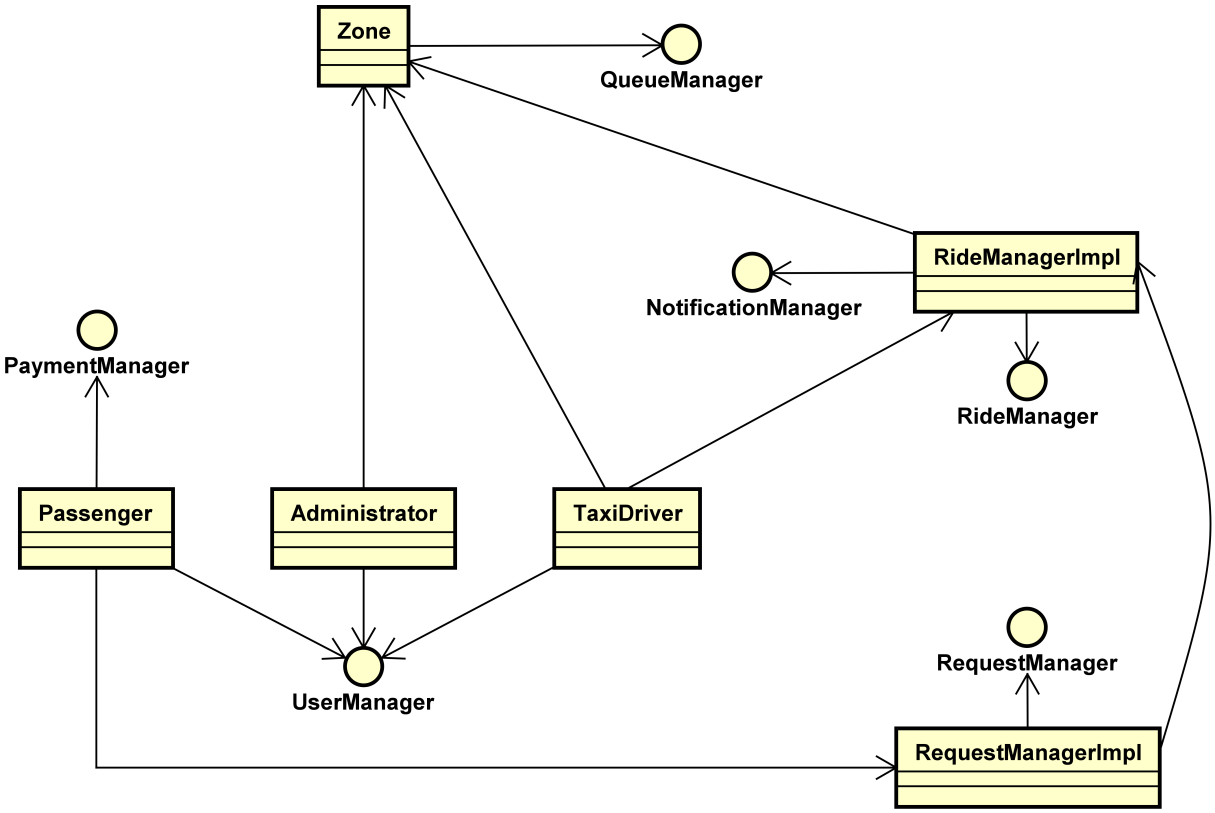
- Third party apps

  This component represents in general the external apps that can possibly connect to the system via our public web APIs.

The following schema shows the above-mentioned components and their interaction.



2.3 Component view



- TeXstudio 2.10.4 (http://www.texstudio.org/) to redact and format this document.
- Astah Professional 7.0 (http://astah.net/editions/professional): to create Use Cases Diagrams, Sequence Diagrams, Class Diagrams and State Machine Diagrams.
- Microsoft Office Visio Professional 2016

7.2 Hours of work

The time spent to redact this document:

- Baldassari Alessandro: 35 hours.
- Bendin Alberto: 35 hours.
- Giarola Francesco: 35 hours.