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The purpose of this document is the detailed description of the design of the lining up mechanism described in the RASD for that system. This document comprehends the definition of high-level architectures used for the system and the models that compose the system. The document describes interfaces and the traceability of the requirements using the traceability matrix to track how requirements are fulfilled by the DD. Then there is the integration, implementation and test plan which specifies how these phases of the development are executed.

This document is mainly addressed to development and design stakeholders.

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The project is developed using both a web application and mobile application for customers, store managers and checkpoint controllers. The presence of both web application and mobile application is intended to reach the highest number of customer due to user preferences. The web application shall be responsive, then it will be usable both on computers and mobile devices.

The application shall be unique and there should not exist different application for different users. The application uses RBAC to verify which functionalities included in the RASD offer to the logged user.

The system is going to be developed with the usage of a DBMS to store information provided by the users and every information needed to implement accordingly with the requirements of the application. Both mobile application and web application front-end interact with the same business components (i.e. there exists only one DBMS and only one Database) and so a user may choose by its own to use the mobile application or the web application.

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Definitions:

1. TODO

Acronyms:

1. **DBMS**: database management system;
2. **DD**: design document;
3. **RASD**: requirement analysis and specification document;
4. **RBAC**: role based access control;

5. **UML**: unified modelling language.

Abbreviations:

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Main version	Subversion	Additions and modifications	
0	1	Purpose, scope of the document and document structure added to the document. Some acronyms have been inserted. An overview of the high-level components and their interaction has been inserted in chapter 2.	

Here is a list of used and referenced documents:

1. IEEE 1016-2009: https://standards.ieee.org/standard/1016-2009.html;

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1.1

Chapter 1: this chapter contains the introductory information to the document. It contains the needed information in order to understand and read the whole document. This chapter includes a list of the revisions done to the document and a list of the documents cited and used as reference to design the system.

Chapter 2: this chapter includes software architectures used to design the system. The chapter uses extensively the UML to define architectural components and architectural views. The chapter once it has defined the entities and the components of the system then defines how components interacts with each other. At the end of the chapter there are specified the selected design patterns and other design decisions which are not described using UML.

Chapter 3: this chapter extensively describes how the interface should be realized in the two types of applications which are the mobile application and the web application. This part specifies what is contained in the users' views using images and describes what is possible to do on the views.

Chapter 4: this chapter is strongly connected with the RASD because it specifies how the requirements for the application are fulfilled by the design document. There is an analysis of the system using the traceability matrix.

Chapter 5: this chapter contains three different detailed plans on how the software components are going to be implemented, integrated and tested.

Chapter 6: this part contains other information about references not contained in the chapter 1.

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The main component is the central application server. Such high level component is in charge of receiving requests from both Customers, Store Managers and Checkpoint Controllers and decides whether to accept or reject them. Its responsibilities include:

- **Queue real time management:** monitors the state of a queue, adds customers to the requested queue, removes them when necessary and calls a new number whenever it is needed.
- **Bookings management:** keeps track of booked visits for each store that subscribed to the service. It handles requests for visits and their deletion.
- **Account management:** allows for registration by Customers. It also provides data verification functionalities whenever it receives a login request.

Another important component is the central Database. Information concerning the accounts of every user, the monitored stores, and records of every visit is stored in such database. This component is normally accessed only via transactions performed by the central application server. However, the DBMS can be directly accessed whenever a sys-admin needs to create accounts for store managers or checkpoint controllers, apart from maintenance and configuration needs.

Users can communicate with the central server by either using a mobile app or an appropriate web application. They will be able to send the intended requests to the main server and receive responses. The main server also exchanges messages with ticket machines, which notify when a customer has printed a paper ticket for instance.

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