Requirements Analysis and Specifications Document

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1. Introduction

1.1. Purpose

This document represents the R.A.S.D. (Requirement Analysis and Specific Document). Our goal is to give a detailed and complete description of the system in terms of requirements (both functional and non-functional) and an analysis of the customer's needs to model the system, detail the constraints and the limit of the software, and show a rundown of the typical use cases that will occur after the release.
This document is directed to the developers who are going to implement the requirements and will also work as a contractual basis.

1.2. Scope

1.2.1. Description of the given Problem

We are going to design and implement a web application named "TravLander+".
The System will allow the users to

- Find the shortest available itinerary given the location of departure and destination, with possibility of modification in case of unforeseen circumstances
- Further customize said itinerary by stating their preferences of transport and desired pauses or breaks, customizing them by specifying how much the break should last and the given timeslot
- Buy and/or book tickets for public transports

The users will have to register (by inserting a username and a password) to be able to use the system. Every user has a set of travel preferences, which can be customized in general as well as for each itinerary, if necessary.
The main purpose will be to offer a quick, efficient, and reliable application to schedule the quickest routes complying to all the user's events within the limits of feasibility.

1.2.2. Actual System

The users will be logging in with their username (or, alternatively, their e-mail address or phone number) and password. The set of preferences will be the basis for all travels, and the users will only need to give as inputs the locations of departure and the destination, the time at which they should arrive to the destination, and the type of event.
After that, they will also be able to customize the preferences for the specific trip (such as some means of transport to avoid) and they will receive the shortest itinerary given these inputs.
The user will also have the further option to arrange the trip by buying/booking tickets for public transport if needed, once the itinerary has been set.

1.2.3. Goals of the System

- [G1] Allows a visitor to register an account
- [G2] Allows the user to set a new password in case he forgot the old one
- [G3] Allows the user to set preferences
- [G4] Allows the user to edit said set of preferences
- [G5] Allows the user to request for an optimized trip
- [G6] Allows the user to edit and arrange trips or completely cancel them
- [G7] Allows the user to set breaks by giving their timeframes and durations
- [G8] Allows to book/buy tickets for their trips

1.3. Definition, Acronyms, Abbreviations

1.3.1. Definitions

- Event: Locations the user has to go to within a certain deadline for a given timeframe
- Trip: The description of route, including the transports, the user takes on to get from the starting location to the event
- Step: A single part of a trip, corresponds to one mean of transport
- Break: An optional pause to consider from all trips and events, it has to be within a chosen timeframe and last for at least a chosen amount of time

1.3.2. Acronyms

DB: DataBase
DBMS: DataBase Management System
RASD: Requirement Analysis and Specification Document

1.3.3. Abbreviations

[Gn] - nth goal
[Dn] - nth goal
[Rn] - nth functional requirements

1.3.4. Reference Documents

- Specification Document: “Assignments AA 2017-2018.pdf”
- GPS Performances: “http://www.gps.gov/systems/gps/performance/accuracy/”
- Alloy Dynamic Model examples

2. Overall Description

2.1. Product Perspective

We will develop the system from scratch, with the support of external systems for GPS tracking, mapping ,and paying (in case of rental transport or buying tickets), in order to guarantee a simplification of the overall implementation by decoupling mapping and payment management from our system, and to guarantee the security of both our client's transaction and the reliability of the provided information.

2.2. User Characteristics

2.2.1. Actors

- *Visitors*: A person using the application without being registered. They can only register (or log in)
- *Users/Registered Users*: A person who has registered and thus, once they log in, they are able to employ all of TravLander's functionalities

2.3. Assumptions, Dependencies And Constraints

2.3.1. Text Assumptions

Credentials that a visitor has to provide to become a registered user are: name, surname, username, email address, and password. Once the registration is completed, a link is sent to the email address to confirm the procedure.
The system, once given the location of departure of the events, calculates the trip which takes the shortest possible time given the user's preferences.
The total duration of a trip is the sum of the durations of the steps taken to reach the location of the event, and the duration of the event itself.
Trips, events, and breaks can't overlap with each other.

2.3.2. Constraints

2.3.2.1. Regulatory Policies

Travlendar+ will be developed in HMTL5 and CSS3 according to W3C org. standards.
It complies with the EU law on cookie policies (D. Lgs. 69/2012 - 70/2012).

2.3.2.2. Hardware Limitation

Travlendar+ will support only web browsers newer than 2010. The responsive view will be suitable for devices with screen sizes starting from 4.2'.

2.3.2.3. Interfaces to other applications

Travlendar+ is strongly dependent on MySQL as the main DBMS.

2.3.2.4. Criticality of the application

The application doesn't have a critical role: any of the actions done by Travlendar+ can be accomplished from a phone.

2.3.2.5. Safety and security considerations

Since the payments are processed externally and the data is handled by an external DBMS, there are no specific security issues there.
The users' personal data is protected, as required by law (D.Lgs 196/2003).

2.3.3. Domain Properties

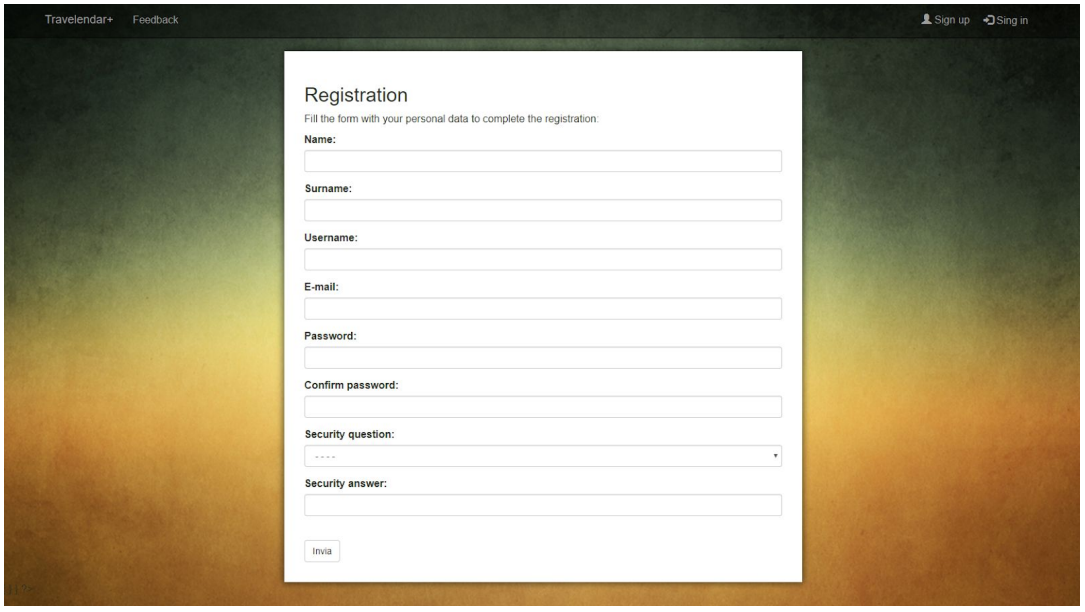
- [D1] - The username and e-mail must be unique for each registered user
- [D2] - The user can't fully employ the functionality of the application until he makes access from the email confirmation link
- [D3] - In case of forgotten password, the new password will be surely sent only to the one user who requested it
- [D4] - User and locations are found by the GPS
- [D5] - The user will be always available to be tracked
- [D6] - The information given by the third party servers (traffic, mapping GPS tracking etc.) are always true
- [D7] - The inputs given by the user are always right
- [D8] - The timeframes have always a limited amount of time
- [D9] - The breaks have to last for at least more than 1 minute
- [D10] - The events have to last for at least more than 1 minute
- [D11] - There can't be a negative numbers of trip per day
- [D12] - The trip will be automatically cancelled once the deadline is past
- [D13] -The system will always give the shortest trip for an event (within the set preferences)
- [D14] - Trips are organized daily (it's not possible to issue a more than 24 hours long trip)

3. SPECIFIC REQUIREMENTS

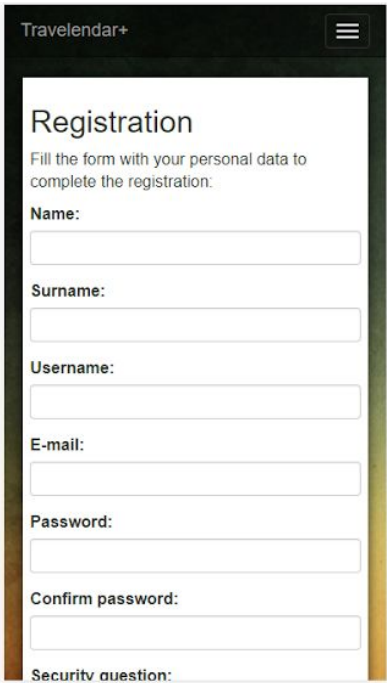
3.1 External Interfaces Requirements

3.1.1 User Interfaces

3.1.1.1 Account creation

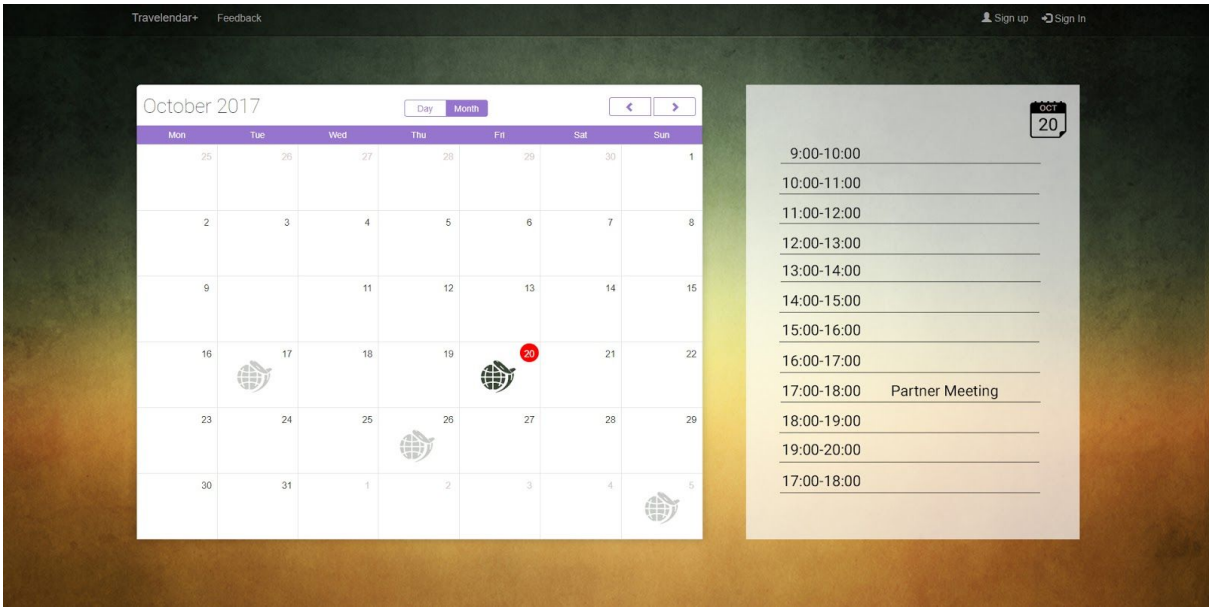


Web



Mobile

3.1.1.2. All Trips



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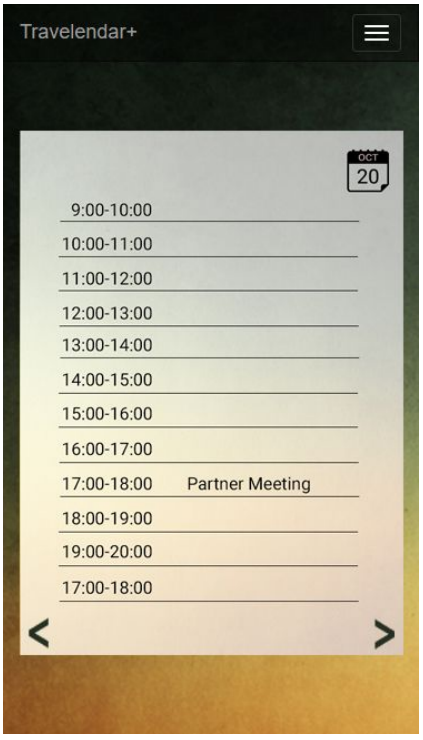
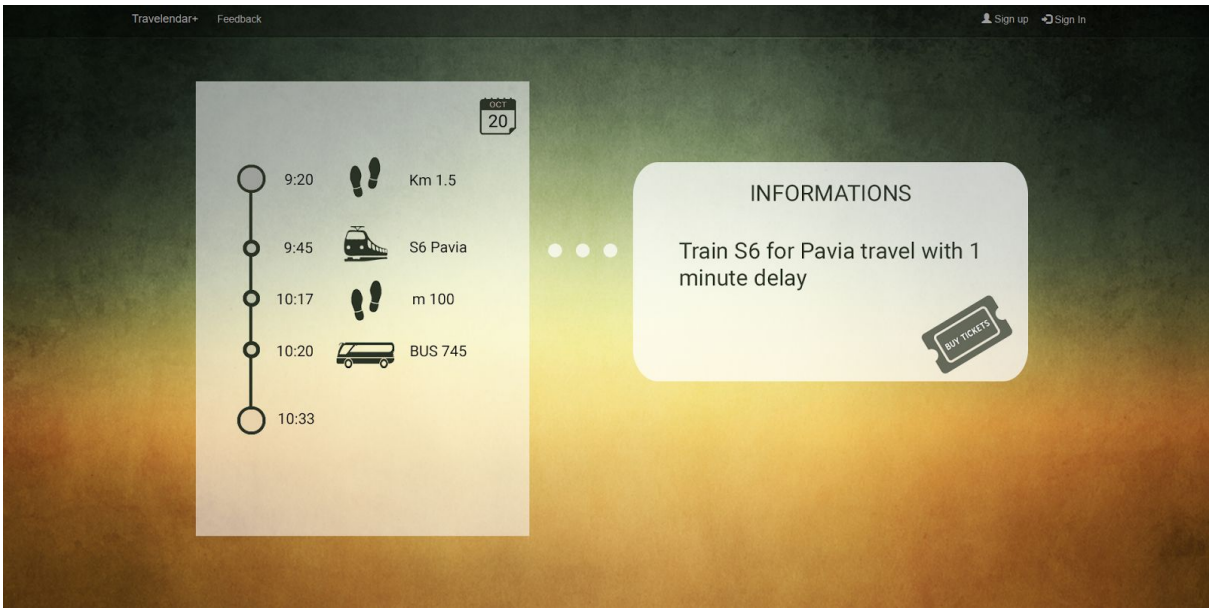


Mobile

3.1.1.3. Specific Trip



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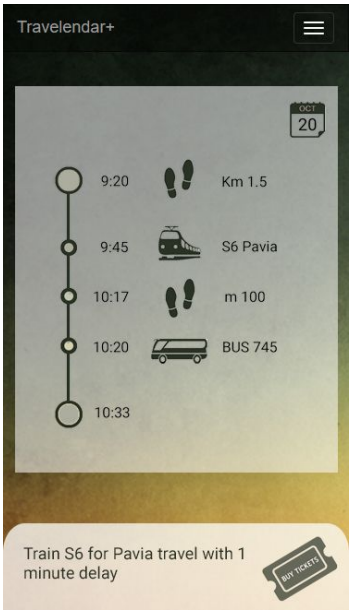
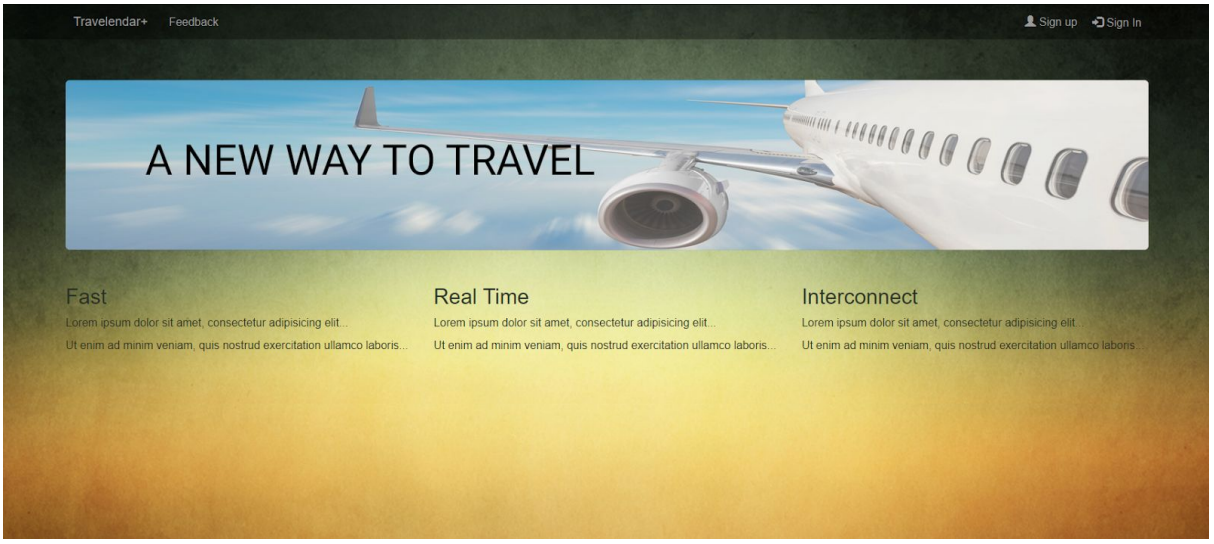


Mobile

3.1.1.4. Master Page



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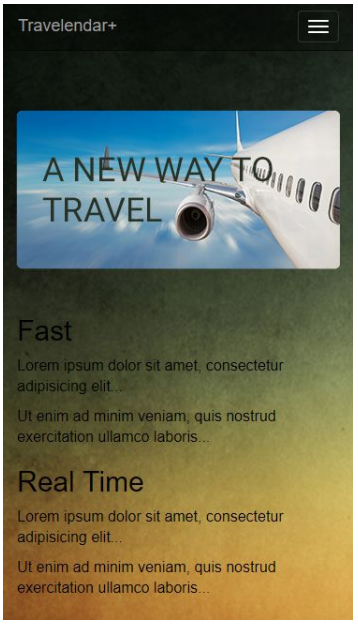
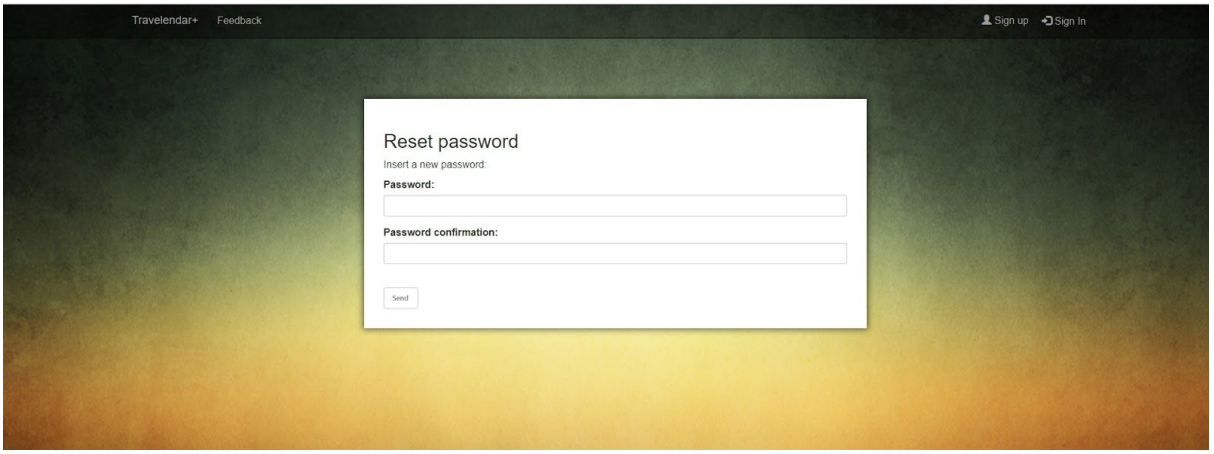


Mobile

3.1.1.5. Password Reset Page



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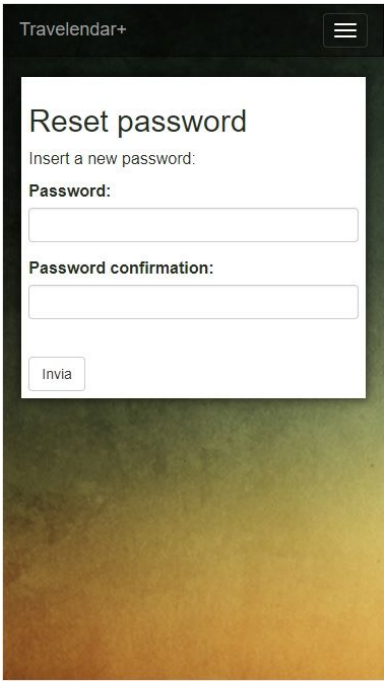

Mobile

3.1.2. Hardware Interfaces

No hardware interface is provided.

3.1.3. Software Interfaces

Our application is suited for most available browsers.

3.1.4. Communication Interfaces

No communication interface is needed.