Politecnico di Milano
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TRAVLENDAR+

DD
Design Document

Sara Pidó 894744
Chiara Plizzari 893901
Giuseppe Severino 898458

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1 Introduction

1.1 Purpose

With the Design Document we would like to make the idea of Travlendar+ application more precise and more detailed. In particular the main goal of the DD is to describe the system in terms of architectural design choices. It is written in particular for developers to help them to identify the architectural styles, the design patterns, the main components and their interfaces and, last but not least, the runtime behaviour.

1.2 Scope

The system aims to provide a complete calendar to users which are also helped to find the best route to reach their meetings and their appointments. Users can insert their meetings in order to have an agenda organized in a perfect way: they can see their trips of the day, their itineraries between appointments. Users can choose between different travel options basing on distances, travel time, cost. The system provides some features to personalize the application in order to please users. In fact they can specify lunch time, they can activate or deactivate some travel means, they can also choose for instance to minimize the walking distance or the carbon footprint. With this new application, people and their smartphones can have a lot of appointments in different locations without having the concern about plan the way to reach them. Obviously if two meetings overlap or if it is not possible to reach one, the system will advice users.

1.3 Definitions, Acronyms, Abbreviations

1.4 Definitions

TODO CHECK AND CHANGE –¿ COPIED FROM RASD

- Visitor: a person that is not registered yet, but has the access to the application‚Äôs information.

- Registered user: a person that is logged in the system and can create meetings.

- Activity: an event that happens in the real world and that could be a meeting or a break.

- Meeting: an activity among the registered user and other people. It can be created, modified and deleted by the meeting‚Äôs creator.

- Break: an activity that a registered user can insert in order to manage it in a customizable way.

- Trip: it indicates the route and the travel means chosen, based on user‚Äôs preferences.

- Location: fixed place where a user stands or where he/she has to attend a meeting.

- Global preferences: they are global attributes that registered users can modify and those are valid for all trips (i.e. minimize carbon footprint).

- Creation screen: the screen of the application in which the registered user create a meeting or a break and enters its related details.

- Blocked travel means: it is a travel means that the user has selected as unwanted.

- Warning: a message directed to the user that arrives to him in form of a notification and can be shown on the application screen. It is generated by the system when there are some impediments for a trip (bad weather, strikes, traffic...) or when there are some problems (invalid data during the registration process or during the creation of an activity etc).

1.5   Acronyms

- DD: design document;

- RASD: requirements analysis and specification document;

- API: application programming interface;

1.6 Abbreviations

1.7 Reference Documents

- RASD;

- Specification Document;

- Example of DD of previous years;

1.8 Document Structure

This document is structured as follows:

Section 1: Introduction   In this section it is described the purpose and the main goals of the document giving a general description.

Section 2: Architectural Design   It gives a general view on how the architecture of Travlendar+ should be showing architectural choices, styles and patterns.

Section 3: Algorithm Design   In this part we include the most critical and relevant parts via algorithms.

Section 4: User Interface Design   This section provides an overview on how the user will see the application through the mockups and UX and BCE diagrams.

Section 5: Requirements Traceability   It explains how requirements defined in the RASD must be mapped to the design elements of the application.

Section 6: Implementation, Integration and Test Plan   This part will include the order of implementation of subcomponents and to integrate them. Moreover it will include our plan to test this integration.

Section 7: Effort spent   Here are reported the information about the hours of work spent by each member of the group by doing this project.

2 Architectural Design

2.1 Overview

This section deals with the architecture of Travlendar+. It is written to explain architectural choices made for the system. These decisions are supported by different diagrams to highlight the view of components and their interactions and to clarify architectural styles adopted in a better way.

The most suitable system architecture that will allow to satisfy all requirements is a three tier architecture. It is helpful also because allows any of the three tiers to be upgraded or replaced independently in response to changes in requirements or technology. In this pattern, we have three subsystems to decouple logic and data, logic and presentation:

- Presentation layer: it is the topmost level of the application. It provides a graphic user interface to the client and it communicates with other levels by which it puts out the results to the client displaying information related to the services and also acquires its inputs to send to other tiers.

- Application layer: it is the mid level. It controls Travlendar+'s functionalities by performing detailed computation. It coordinates the application, processes commands, makes logical decisions and evaluations and perform calculations. This layer also interacts with external systems that support our application.

- Data layer: it is the level in which information are stored and managed. It includes the data persistence mechanisms (database servers, file shares etc.) and the data access layer that encapsulates the persistence mechanism and exposes the data. It is kept independent from application logic and presentation layer.

TODO IMMAGINE TODO HIGH LEVEL COMPONENTS

2.2 Component View

In this section we will present the whole system. We will focus on all components and their interactions. This diagram will provide also an overview

on interfaces that components provide for interactions.