MyWay

EUROPEAN SMART MOBILITY RESOURCE MANAGER

MyWay: European Smart Mobility Resource Manager

D3.1.2 MyWay Platform Detailed Technical Design 2

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EXECUTIVE SUMMARY

This document shows the technical design of the MyWay platform built on the outcomes of WP2 in particular, starting from the conceptual architecture defined in D2.3 [MyWay D.2.3]. It considers also the requirements of D2.1 [MyWay D.2.1] and takes in account technologies and standards summarized in D2.2 [MyWay D.2.2] to define all the software components composing the MyWay platform and their interactions. Moreover, each component has been described in details from a functional and technical point of view.

Due to the research nature of the MyWay project and in order to build a system that fully satisfy user requirements (collected at the begin of the project but also evolving during the project itself), MyWay platform has been planned to be an incremental platform to be released in two phases:

- 1st Phase, a first approach to MyWay, described in previous version of this document Deliverable D.3.1.1 *MyWay Platform Technical Design I* [MyWay D.3.1.1].

- 2nd Phase, the complete MyWay platform, which extends the 1st prototype developed in the previous phase, described in this document.

This document describes the technical design of the final prototype, including many elements of the first prototype and representing the final design of the whole MyWay platform.

This is organized as described in the following:

- Overview of the whole system including the description of its architecture, the list of requirements and use cases addressed, and the MyWay platform main features and functionalities.

- Description of MyWay general strategies to address security, privacy and scalability issues.

- The MyWay "user centric" features as the Trip personalization and Feedbacks.

- The available external sources and an introduction of Metaplanner concept

- General development guidelines followed to transform the MyWay architecture into the MyWay platform implementation.

- Detailed description of MyWay software components in terms of diagrams, algorithms, peculiarities, etc.

- Conclusions.

The design has been performed as collaborative task of all WP partners involved. The detailed description of the components, their algorithms and their detailed interfaces for

communications has been designed co-ordinately by all the partners involved in the implementation phase.

Respect to the first version of this document the following list summarizes the main changes:

- Technical Design Overview (Section 2): new aspects of the system have been analysed and designed as the trip personalization (Section 2.8) and the way in which the user feedback is collected and exploited inside the system (Section 2.9). The section 2.12, reporting the external data and services exploited by the MyWay platform, has been extended to include new data sources and 3rd party services. All other sections have been updated and slightly modified due to minor modifications applied to the initial design of the platform.

- MyWay Components (Section 3):

  o Trip Organizer and Follower:
    - Trip Planning and Planning Graph Maintainer. This component is in charge of the trip composing and maintenance of the core Metagraph. In Phase 2, the main improvements have been done in the internal functionality and refinement on the trips and the optimization of the structure and creation of the Metagraph. The data demanded to create and update it has also been optimized and it is currently lower than it was originally planned in the MyWay platform. This affects also the frequency of metaplanning graph updates, which is significantly lower than in common trip planning approaches. The Trip Planner component also produces notifications for a user based on available context information.

    - Mobility Resources Manager. In the implementation two, the Mobility Resources Manager will aim to manage booking and service availability capabilities for Mobility Services presented in the Cities. More specifically, it will manage the booking functionality for the electrical scooters of Motit as well as booking services for taxi.

    - Trip Follower. This component is in charge of tracking the user's position during a trip. The main improvement for phase 2 is that the user position is matched to the trip itinerary in order to detect situations where the user deviates from the planned route and an update of the trip plan is required. Moreover, the Trip Follower now detects near POIs for touristic users.

  o User Profiler and User Manager which is composed by:
    - UserManager. This component manages sensitive data from the user. It manages users profiles and preferences, including storage and authentication system. For the 2nd phase, this component has been enriched to manage the users' statistical profiles.

- UserStatistics. This one is a new component introduced in phase 2, to produce statistics on the MyWay platform, for all users and per individual. From the trip history, this component produces, on one hand, a statistical profile for each user, and on the other hand, data analytics (how many travelled km, burned calories) for all users and per user.

- PreferencesEngine. Due to the heterogeneity of the planners, the PreferencesEngine has been designed to adapt the user request parameters to low level parameters that can be understood by all planners. To achieve this, it uses the user's data (profile, preferences, statistical profile) and contextual data, to first personalize planners parameters, and next, it assigns a score to the response trips based on their affinity with to the user preferences.

o MyWay Front-End Mobile Apps: This new version will be more ambitious regarding the number and complexity of the functionalities and will have new capabilities for booking, integrate new flexible mobility services and provide real-time information for mobility services will be included. Some existing characteristics in implementation one will have their functionality extended or improved.

o Data Provider, this component is in charge of data provision to the whole Backend, and in Phase 2, one of the main goals has been the inclusion of Real Time provision and the Dashboard to manage data loading and import processes in MyWay. It also includes the Feedback Manager as one of the new components for this Phase. And, from the previous Phase it is the responsible of providing also Geocode Services.

o Interfaces, this component is in charge of communication with every external service used in MyWay. Its main improvements for this Phase have been the enrichment of the options to request from trips to the Sub-planners and also the communication with external providers of context data and Real Time services for transport and for infrastructures.

o Service E2E Orchestrator: due to the increased number of available functionalities the design of the Orchestrator has been modified to better organize the operations provided and improve its reusability through different technologies.

o Open-Api: the operations offered by the Open API have been enriched and re-organized due to the availability of new methods offered by the Orchestrator and by sub-components.