MaaS Provider

Enterprise Integration Project Proposal

Rui Ventura and Pedro Cerejo
81045 81338

Alameda – Group 10

Instituto Superior Técnico, Universidade de Lisboa
pedro.cerejo+rui.ventura@tecnico.ulisboa.pt

1 Business Context

Urban mobility is rapidly evolving, not only due to the increased awareness with environmental issues, but because of the huge impact digitalization has on the traditional ways people are able to use transportation systems.

The idea behind Mobility as a Service (MaaS) is analogous to that of Software as a Service (SaaS), a term popularized by Cloud technology: people use the transport network they see better fits their needs while doing so in a flexible and easy fashion, also enabling the inclusion of innovative alternatives for personal transportation like rental bike, scooters, motorcycles, and the likes.

The main challenge arises when it comes to seamlessly integrating all of these services together without the hassles that come with the need of multiple ticketing mechanisms or devices, be it through the usage of physical cards or different mobile applications, proving card/device and fare payment management arduous tasks.

With this proposal, we aim at building a MaaS platform that is capable of incorporating several transportation services with ease, enabling further operation adherence in the future, as well as providing the customer a satisfying experience by removing the need to manage all of the little intricacies of using multiple different transportation networks.

2 Entities

As part of the proposal, we aim to integrate with three different transportation operators that provide three equally different means of transportation. We chose the following operators: (1) Metro de Lisboa (ML), (2) Transtejo & Soflusa (TTSL), and (3) Taxify.

2.1 Metro de Lisboa

Metro de Lisboa is responsible, as the name hints at, for the metropolitan transportation in Lisbon, enabling users to travel through the city using the subway.

It can be used by acquiring individual tickets, at a fixed fare for occasional usage. However, for more casual usage, the user can acquire a monthly subscription.

2.2 Transtejo & Soflusa

Transtejo & Soflusa is a ferry company operating between Lisbon and regions to the south side of the river, operating various ships and conventional vessels. It also provides similar payment models to ML's and can be combined with the latter as well as with other transportation operators in Lisbon.

2.3 Taxify

Taxify is an international transportation network company. They're product is an application that allows users to request a taxi or a private driver from their smartphone. Unlike the previous services, the fare is computed based on the distance of the trip.

3 Services

The proposed platform is composed of a series of microservices tasked with different clearly distinguishable goals in order to efficiently perform a series of actions and participate and relatively elaborate processes which lead to the

3.1 Catalog Management

This service is tasked with keeping the set of products, their respective prices, and usage rules for each of the transportation operators' products, providing this information as a collection to the other services, or even the customer, when required.

3.2 Settlement Distribution

This service is responsible for registering trip events published by the user and appropriately distributing the revenue across the operators, taking into account several aspects that may influence the computation which can be service dependant, such as the trip's duration.

3.3 Account Management

This service handles customer related operations. It exposes the MaaS provider's user registration mechanism, allowing new users to enroll on the platform; it handles the Product Instantiation, providing a way for users to purchase "tickets" for their trips and managing the user's finances inside the system, issuing debit orders and blacklisting the users whose balance prevents them from using the integrated transportation services.

The aforementioned "tickets" are metaphorical, realized in the way of tokens with temporal validity the user can then supply to a transportation operator's validator when using the means of transport the user chose.

4 Functionality

In order to arrange a system that seamlessly integrates several entities involved in the MaaS ecosystem (Payment services, Transportation services, Ticketing infrastructure, etc), this system provides a set of crucial functionalities in order to provide both the users and transportation operators a good experience.

The system's main selling point, form the user's perspective, is the ability for the user to use several means of transportation available in the city with ease. To cope with this requirement, the system provides a catalog with all the available transportation services and their payment models, allowing the user to issue a ticket or request a ride on-demand or in advance, in case they won't have access to the system at the time of the trip. This process is described in Figure 3. Another issue that this system addresses is the current difficulty for users to register in several operators and manage their balance. The MaaS provider replaces the need for multiple accounts spread across the several operators. Users register once and can check the balance and history of their account. The user registration process is illustrated in Figure 1.

When it comes to transportation operators, this system facilitates the integration of new ones, allowing them to register and announce their products. Since the handling of check-in and check-out events belongs to MaaS provider, the operators don't need to implement any logic related to settlements or user identity verification. A process that entails these aspects is depicted as a BPMN model in Figure 3. The MaaS provider supports several payment models, providing compatibility with already adopted transportation services.

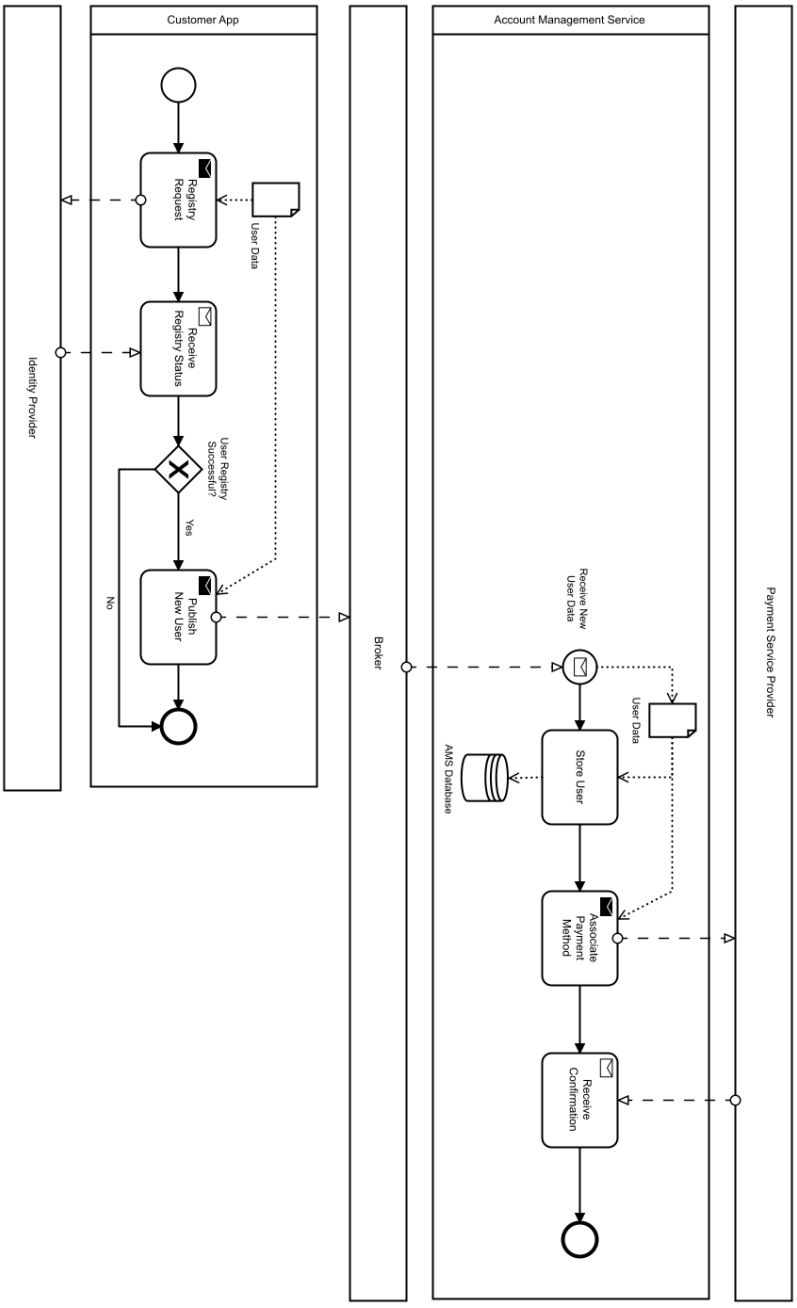

Fig. 1: User registration process

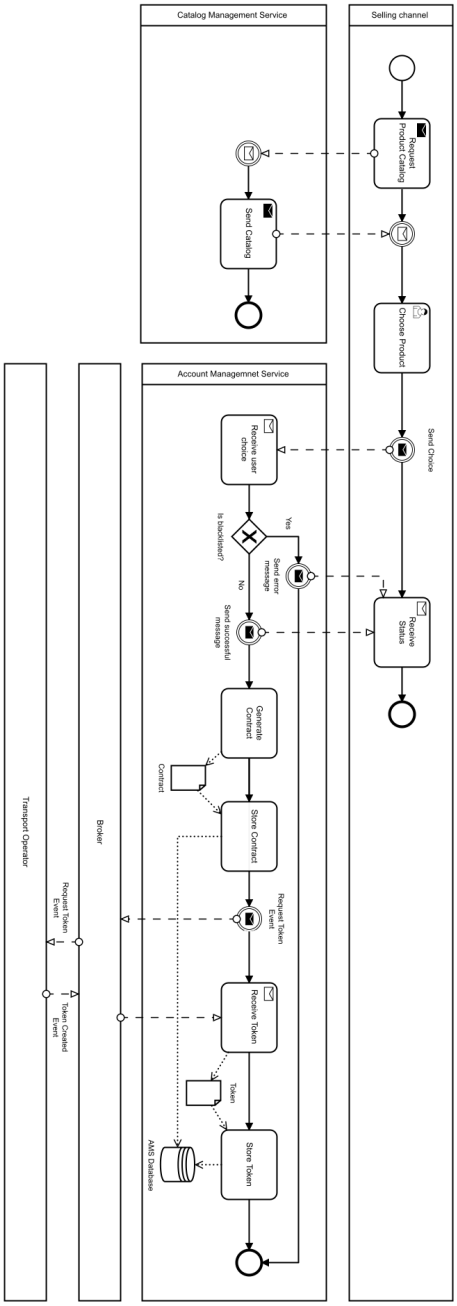

Fig. 2: Product purchase

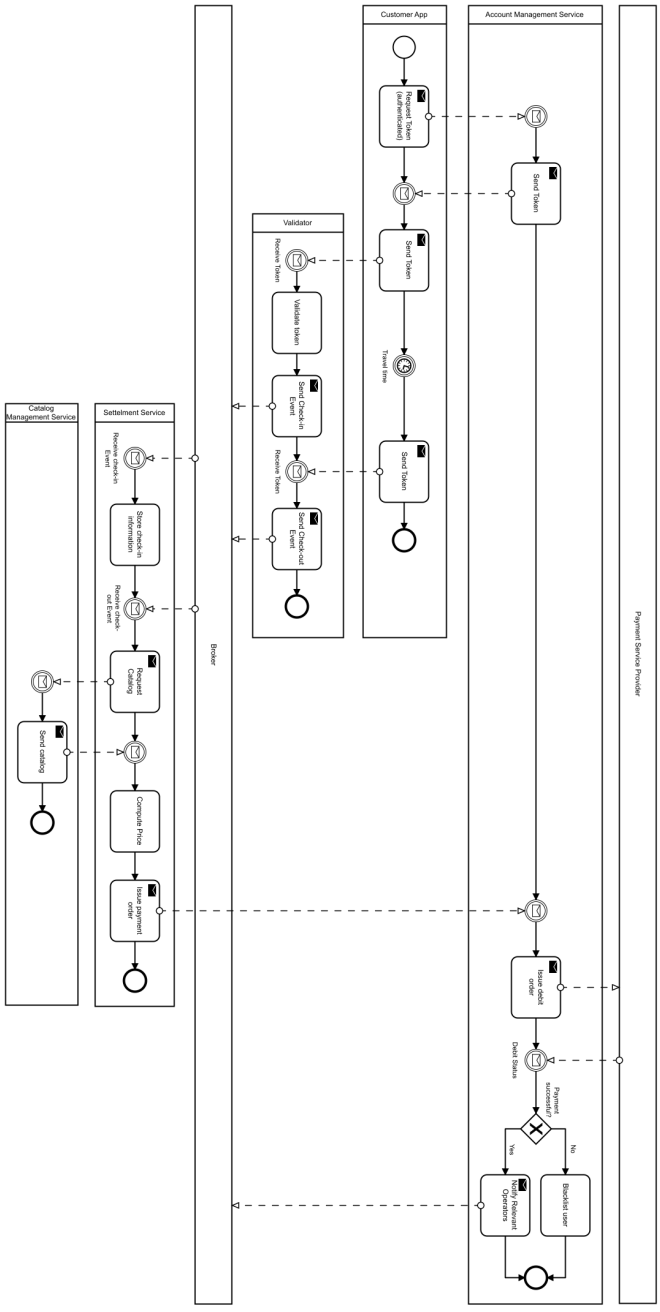

Fig. 3: Check-in / Check-out trip process)