ACCEPT Institute

Horizon 2020 ETC 636126

Functional Specifications Interoperable Traveller Interface

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Deliverable 9.1

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1 Introduction

1.1 Introduction & Summary

This document describes Deliverable 9.1 and is part of work package 9 '*Interoperable Traveller Interface*'.

Objectives

The objectives of work package 9 are:

- to develop technological standards and connectivity for Travellers Clubs to seamlessly and cost-effectively integrate the online booking, payment, ticketing services and travel alerts of clubs from other regions and countries for their member travellers, which they continue to serve in their own language and according to their own preferences. See deliverable 9.3.

- to develop a demonstration back end and reference App that depicts the user experience for a Traveller travelling cross-border and solely abroad. See deliverable 9.2.

Summary

This document describes the functional specifications of the Interoperable Traveller Interface, or smartphone app. This smartphone app connects to the ACCEPT EcoSpace Core via an API: the Mobile API (see deliverable 9.3).

We used relevant input from our project partners to define these functional specifications, as they are responsible for the implementation of the different smartphone apps, used in the ETC project. The result is an overview of the functional specifications, which can be used for implementation of such an app.

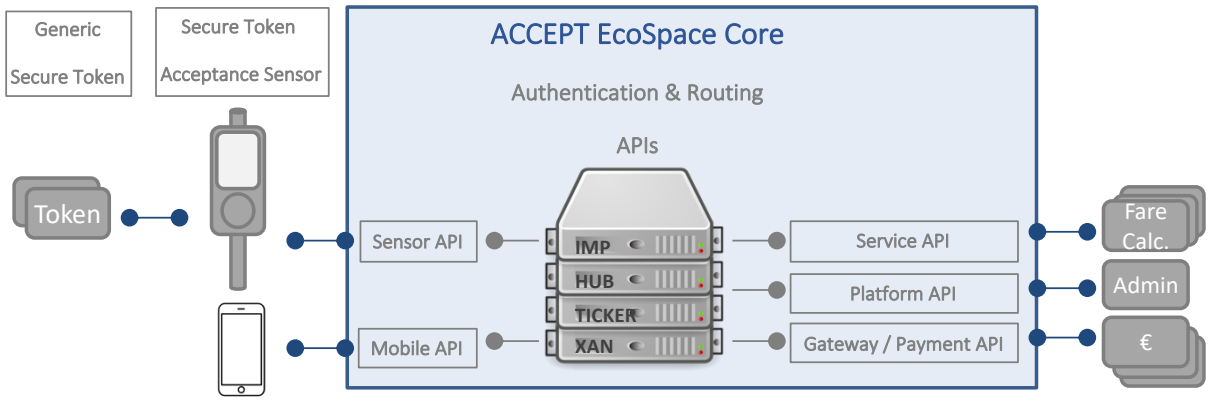
2 Content

3 Interoperable Traveller Interface and Eco Space

This chapter describes the relation between the Interoperable Traveller Interface and the overall Eco Space Core Software, the heart of the European Travellers Club system.

3.1 ECO Space Core Software

Below a high-level description of the ACCEPT EcoSpace Core Software is presented. It starts with an overview of the logical components, followed by the overview of the APIs and the micro-services.



3.2 Logical Components

The EcoSpace Core Software consists of the following **logical components**:

- IMP:
  Identity Management Platform for Private, flexible and intuitive Account Creation with facilities for binding tokens, services, payment methods to a person's avatar.

- HUB:
  High speed transaction authentication and validation, routing and processing hub that masks identity and supports complex processing for multi-legged transactions.

- TICKER:
  Real time transaction overview showing individual consumption of services with Tokens/IDs in the field, a running record of everything tapped.

- XAN:

Transaction Acceptance Network, with methods for onboarding tokens, devices, people, services, and payment methods and monitoring their performance and service levels in real time during operation.

3.3 APIs

Furthermore, the EcoSpace Core Software consists of the following **set of APIs** for development and integration of external solutions:

- MOBILE API:
  Account Creation, APP creation, Ticker Views.

- SENSOR API:
  For device makers to attach their devices (*secure token acceptance sensor*[1]) to the XAN.

- SERVICE API:
  For services like Fare Calculation, Park&Ride, ticketing systems and other often travel related multifunctional services such as rentals and in-station lockers.

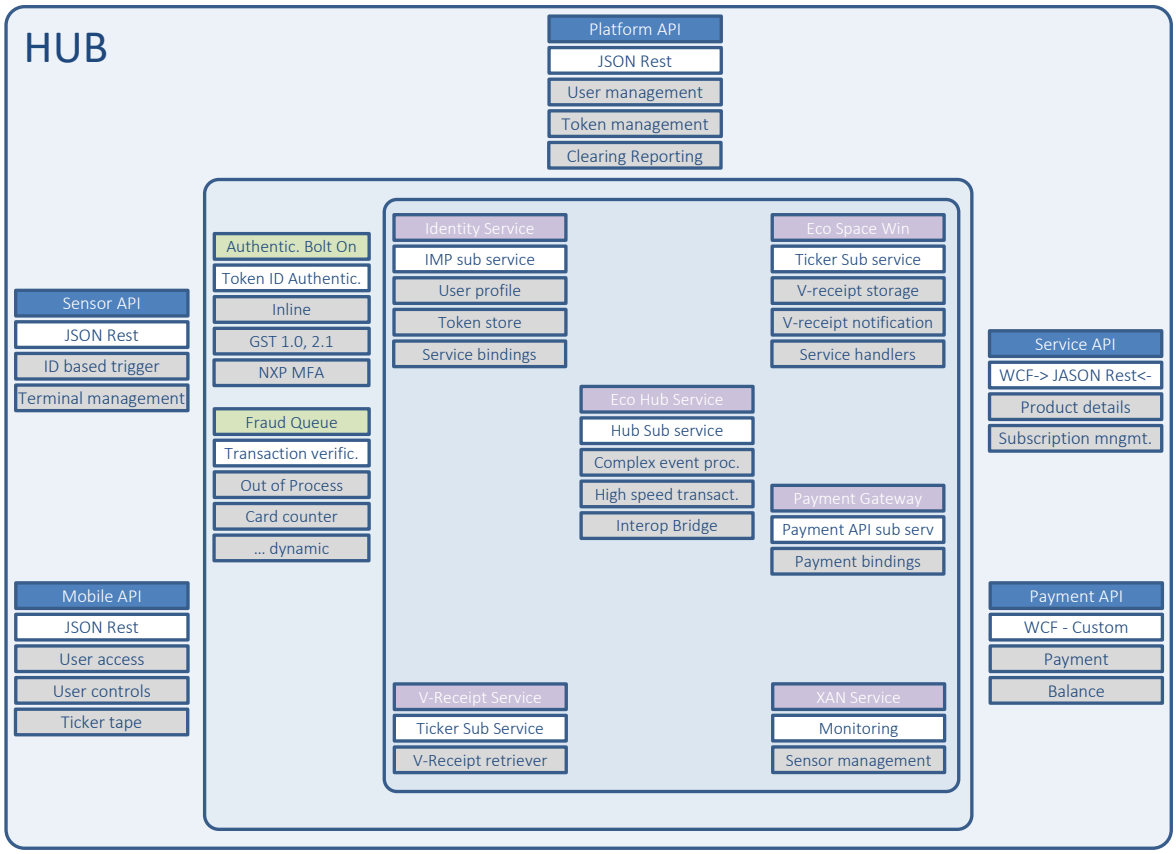
- GATEWAY / PAYMENT API:
  High speed secure router for normalizing custom developed bank connections to a universally consumable payment method.

- PLATFORM API:
  To afford users of the Platform API (owners of a particular Hub) access to administrative functions related to Account Creation, Token Registration, and Transaction Reporting.

3.4 Micro Services

Logical components such as IMP, HUB, Ticker and XAN, are comprised of underlying **micro services**.

[1] The specification of the necessary software in the Secure Token Acceptance Sensor (STAS) is described in the document: "Secure Token Acceptance Sensor *Behavior and Interface Specification*). This document provides the interface specification between the STAS and the ACCEPT EcoSpace Core and the interface between the STAS and the Generic Secure Token (GST) ID.



3.5 Interoperable Traveller Interface

The Interoperable Traveller Interface, or smartphone app, connects through the Mobile API (see deliverable 9.3) to the Eco Space Core. Deliverable 9.2 shows examples of implementations of smartphone apps in the ETC project. This document further describes the functional specifications for the Interoperable Traveller Interface.

4 Functional Specifications

The functional specifications can be divided into the following categories:

- Account creation
- Card binding
- Payment binding
- Transaction ticker
- Interoperable journey planning
- Interoperable account-based ticketing
- Interoperable real time travel information

4.1 Account creation

- It must be possible for users to create an account. This must be possible for a pre-defined list of users, or for single, new users.
- Users must be able to create accounts with their own e-mail address and password.

4.2 Card Binding

- It must be possible to bind an (existing) travel card (with the ETC token, Generic Secure Token) to the Traveller Interface (smartphone App), this can be done via:
    - engraved ID;
    - card number;

4.3 Payment Binding

- It must be possible to bind a payment means to the Traveller Interface (smartphone App)

4.4 Transaction Ticker

- The Traveller Interface should have a ticker that shows V-Receipts for all transactions made, examples are:
    - tickets purchase;
    - ticket validation;
    - ticket redemption;
    - pay-as-you-go receipts (check-in and/or check-out transactions);
    - loyalty coupons;

4.5 Interoperable Journey Planning

- The Traveller Interface should provide the possibility to plan a trip. Plan a trip form A to B anywhere throughout Europe. ETC Member should be able to compare options and select the most desirable route.

4.6 Interoperable Account-Based Ticketing

- The Traveller Interface should provide the possibility to purchase tickets for a trip.
- It should be possible to select and purchase best ticket (or combination of tickets) for the trip desired, insight into best price, Estimated Time of Arrival (ETA) and route options.
- It should be possible to use the ETC member's payment method of choice to fulfil the purchase.

4.7 Interoperable Real Time Travel Information

- The Traveller Interface should provide the possibility to track a trip made.
- Step by step directions in your own language that guide you all the way to your destination, including walking segments, transit transfers and waypoint identifiers.
- Travel Alerts and Route Alternates. Receive real-time alerts regarding issues on route and suggest route alternates.

4.8 List of Features of the Traveller Interface

High Level Features	Description	Details
Splash Screen	The first screen that shows up when a user launches the application	A splash screen with a logo [of a ETC member] will be shown. This splash screen may be subtle animated, and should represent clearly what the functionality of the app is.
Push Notifications	Messages sent to users in-app	Push Notifications must be included in the app specifications. A free service like Google Firebase would be preferred.
Analytics	Metrics that run the gamut from downloads to usage information	Full analytics of the data must be present to understand user behaviour and usage.
Payments	Ability to facilitate transactions	A PSP must be implemented to handle all different kinds of European payment transactions.
Localization	Adapting app to specific geographic areas (language, content, etc.)	The app should be available in a minimum of [3] languages: German, French, English, based on the language set of the mobile phone with a selector to change the language.
Email Login	Users login via email	Single Sign On (SSO) solution should be implemented.

Social Login	User login via social profile	Social Login *could* be connected to the SSO solution (Facebook, google, Microsoft, Twitter).
Placeholder Images	Displayed when images from the services fail to load	Images that cannot be loaded should show the logo of [a ETC member].
Error Messages	Prompts for in-app errors	Limit the amount of user-visible errors. Error logging should be available in the Backoffice. Show visible feedback to the users and minimize the error handling on the UI.
Camera Access	App can prompt camera for pictures/video	Support Face ID and Touch ID to ensure strong authentication upon payment.
Push Notifications Access	Determining how push notifications are accessed	Provide consumer choice for Push Notifications.
Forced Update	Users are required to upgrade app to continue	
Maintenance Mode		Maintenance mode should fall back to a single page that states people need to wait.
Character Limits	Limit on number of characters allowed for particular fields	To be defined.
App Indexing	Indexing your app so it can be found on search engines	
Deep Linking	URIs link to specific locations within the app to ease usability	As required.
Sharing	Ability to share content, to other users on social, SMS, etc.	Time travel information can be shared on social/sms/other options.
Offline Mode	Certain features have the ability to work without internet connectivity	Purchased tickets should be available offline.
APIs and Web Services	Existing/new APIs and services necessary for the app to function correctly	The mobile API with the Eco Space Core is a minimum standard.
Platforms and Devices	iOS, Android, etc. Tablet, smartphone, Smart TV, etc.	iOS, Android, Windows, Tablet, Smartphone
Menu and Navigation	Main menu/navigation to flow through app	To be provided.
Minimizing App Rules		The app should function as responsive as possible. The app should save code state and restore to speed up the usage for the consumer.
Webview	Browser bundled inside an app	There are no webviews available in the app. All information should be pulled in and presented in a native way.
Landscape Mode	App displays correctly	The app does not have to support landscape mode.

	when device orientation changes	Content is best represented in Portrait mode
Accessibility	App takes step to ensure inclusive access for disabled	Compliancy with EU regulation is mandatory: http://data.consilium.europa.eu/doc/document/ST-9389-2016-INIT/en/pdf
Content Management	System/process for managing app content	A backoffice systems should be created to update the content of the app. Based on the functionality of the app, the Backoffice can be defined.
Use of Gyroscope	Sensors in gyroscope allows phone to measure their current orientation	As Required
Use of NFC (near field proximity)	Set of protocols that enables communication between two devices	As Required
Use of Bluetooth	Allows connectivity with other Bluetooth-enabled devices	As Required