Co-Active

D1.4 – WP1 Travel Shopping FREL Ontology

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REPORT CONTRIBUTORS

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Table 1: List of Contributors

Related documents

Reference Number	Title	Revision
1	Proposal	final
2	IT2Rail ontology	final
3	Co-Active D1.1 - TD4.2 CREL Ontology	final
4	TRIAS Specification	v1.2
5	Co-Active D2.4 - TD4.3 FREL Ontology	final
6	Co-Active TRIAS extensions	0.5.1

Table 2: Referenced documents

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LIST OF ACRONYMS

IT2Rail	**I**nformation **T**echnology For Shift **2 Rail**	IP	**I**nnovation **P**rogram
S2R	**S**hift **2 R**ail	MaaSive	Project Massive: Enabling **Maas** in the IP**4 E**cosystem
ST4RT	**S**emantic **T**ransformations **f**or **R**ail **T**ransportation	B&T	**B**ooking and **T**icketing
TS	**T**ravel **S**hopping	TD	**T**echnical **D**emonstrator

Table 3: List of Acronyms

LIST OF TABLES

1. INTRODUCTION

The current document aims to present a subset of the S2R-IP4 reference ontology that is relevant for travel shopping functions.

An ontology is used to capture knowledge about some domain of interest. The domain of interest of S2R-IP4 is focused on a multimodal travel combining several modes of transport, several operators in several countries. Now that the domain is known, it is necessary to formally represent the domain's knowledge by a set of concepts and the relationships between those concepts. In other words, an ontology provides a vocabulary that is shared among the involved stakeholders which can be used as a model. Having a shared model is the basis to understand the formal definitions of concepts and their relationship.

The represented ontology used in S2R-IP4 program started with the IT2Rail project (Information Technology for Shift to Rail). It was the first stage of subsequent multiple projects aiming to give full control of the door-to-door travel experience across transport modes and services to the traveller. The ontology defined in IT2Rail was afterwards inherited by the subsequent IP4 projects (ATTRACkTIVE, Co-Active), and was "cleaned" and refined in an early stage of the projects, to be used as the starting point and to be updated during the projects life.

The present document is based on a template provided by CONNECTIVE that wants to identify needs from ATTRACkTIVE and Co-Active in order to propose an updated IP4 reference ontology by the end of both projects. This document is focused on identifying the ontologies relevant for TD4.2 (Co-Active WP1). Although at a software level the ontologies are managed using OWL (Web Ontology Language) and are created using Protégé-OWL editor, for the exercise of identifying changes to the IP4 ontology at WP level, the document proposes to represent them through a simplified and more visual approach which is easier to understand by non-experts on ontologies:

- On one side, the document presents diagrams that depict a visual representation of the TD ontology, including main terms involved and relations among them
- It is complemented by a table that includes the glossary terms identified in the project (terms and definitions), that are represented in the diagrams. In addition, it includes a column to show the relation with previous IT2Rail concepts.

2. TRAVEL SHOPPING ONTOLOGY

As described in the introduction section, the following schema illustrates a *visual representation* of the ontology proposed for IP4, and in particular the parts applicable for the Travel Shopping.

The schema shown in the present section is the representation of the module of TS taking into account the terms and their relations.

This representation of the ontology has been obtained from:

- Data models and interfaces in IT2Rail involved in TS
- Definitions from Booking and Ticketing as well as ATTRACkTIVE's Travel Companion and Trip Tracking
- Adaptations linked to Co-Active and ATTRACkTIVE deployments, including also the review of the glossary made in these projects, as well as used TRIAS interfaces and the TRIAS extensions for Co-Active.

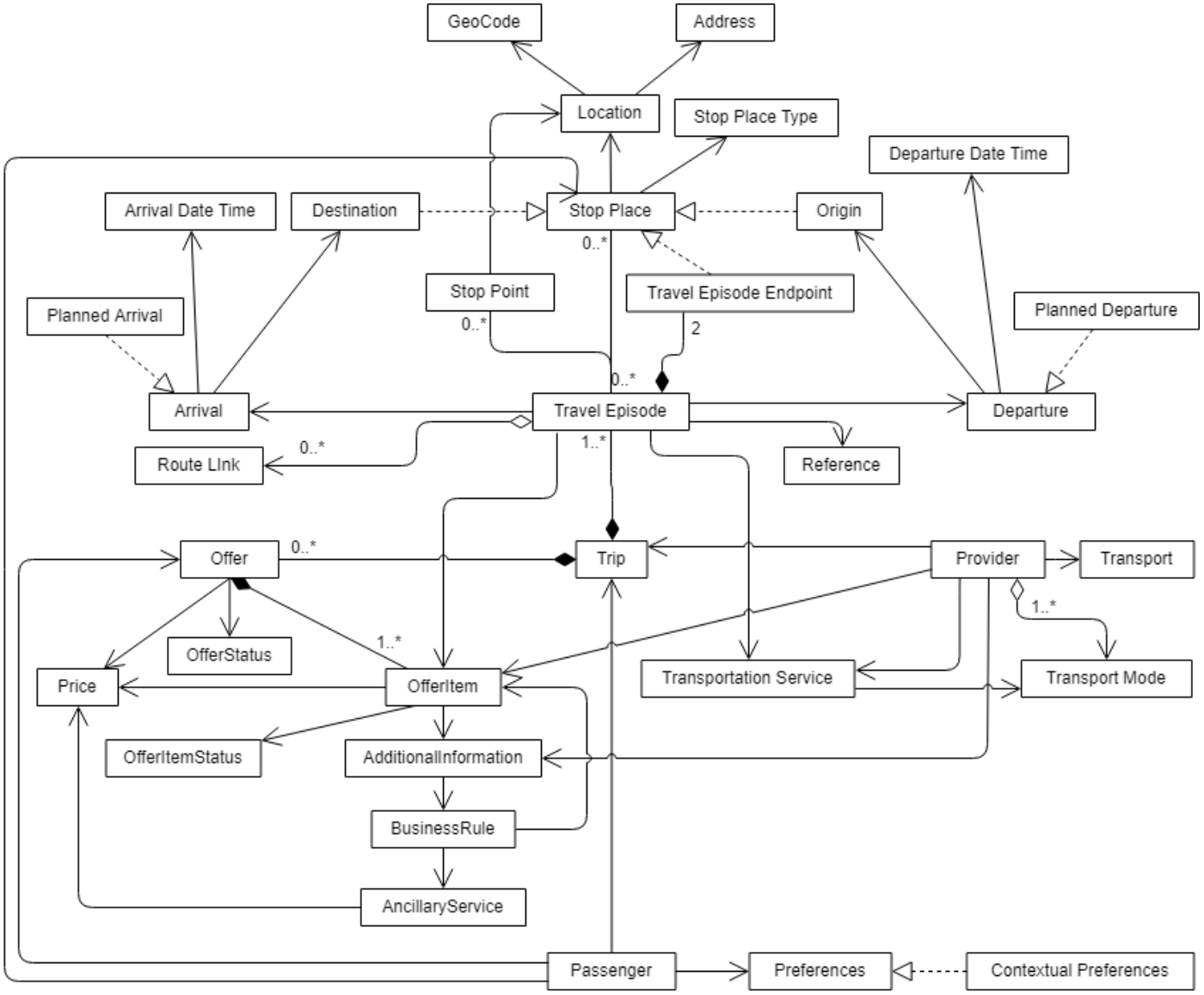

Figure 1: Travel Shopping Ontology Schema

3. TRAVEL SHOPPING TERMS

Based on the concept explained in the introduction of the document, this section describes the terms used within the schema.

The table is structured as follows:

- **Term**: the name of the concept that is to be described and which is used in the schema.
- **Description:** the meaning of the term in the context of the Travel Shopping domain. It contains the definition from the S2R glossary.
- **Relations:** list of other terms of the S2R-IP4 ontology which also links this part of the ontology to the other ontology parts in S2R-IP4.
- **Terms described in S2R and its relation with other ontologies:** this column explains the origin of the term.
- **Representation in TRIAS:** The name of the element, group or structure in the TRIAS specification which is used to represent the term within Travel Shopping.

In Co-Active, TRIAS (Travellers' Realtime Information and Advisory Standard) is the protocol used to implement the Travel Shopping functionality between the Shift2Rail ecosystem and the Travel Experts. Therefore, this ontology also documents where the terms are represented in TRIAS. Co-Active is leveraging the extensibility of TRIAS to define additional non-standard fields which are used for the Travel Shopping. This document references to the attachment which contains the schemas of the extensions and highlights non-standard TRIAS representations in the table below with a grey background.

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Additional Info	Entity related to OfferItem with auxiliary data such as sales conditions, the provider that provides this route (Travel Shopper) and other relevant information provided by the Provider.	• OfferItem • Provider	This term has been included in S2R-IP4 ontology in order to set all the supplementary information regarding its related entity OfferItem provided by the Provider	• OfferItemContext • FaresAuthorityCode
Address	Location identifies with its street, number and country	• Location • StopPlace	This term has been included in S2R-IP4 ontology but it was used in IT2Rail for data exchange.	• AddressStructure
Ancillary Services	Ancillary Services are side Products which are bound to transportation Products in an Offer.	• Price • TravelEpisode	This term has been included in S2R as an entity because it already existed as a concept in IT2Rail.	• TicketStructure
Arrival	An Arrival is a Transport Event, occurring, or planned to occur at a specific Arrival Date Time and Stop Place.	• Travel Episode • Destination • Arrival Date Time • Planned Arrival	This term is inherited from IT2Rail	• LegAlight • LegEnd • StopPlace • Call

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Arrival Date Time	The date and time values associated with the Arrival that marks the actual and/or planned end of a Travel Episode.	• Arrival	This term is inherited from IT2Rail	• ServiceTime • AimedArrivalTime • ExpectedArrivalTime • TimetabledTime
Business Rule	A business rule describes an agreement/contract between at least two stakeholders and has an (in)direct impact to a traveller.	• Business Rule Engine	This term is inherited from IT2Rail	
Business Rule Engine	Part of the TSA which interprets BR in order to reflect the impact to Itineraries and Offers.	• Business Rule • Travel Shopping Aggregator (TSA)	This term is inherited from IT2Rail	
Contextual Preferences (C)	These preferences depend on the context of the travel; therefore, they are tailored to each situation or a certain type of travel (e.g.: leisure vs. working trip, airplane vs. train, temporary impairment or others). Some of these preferences are connected to travels and travel habits and can be accounted for by the Travel Companion whenever a given context is active.	• Passenger • Preference	This term has been included in S2R-IP4 glossary and, regarding exchange of data, it is a set of preferences related to a specific passenger when the passenger has activated a specific profile or when a profile has been used for a specific travel.	• Preferences • UserExtension

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Contractual Management Market Place	This component manages business rules, which govern the business relationship between the transportation partners (TSPs). The authorized users to configure providers and agreements. The system gives access to formal contracts generated from agreements. The business rules will be used to build an offer and Clearing and Settlements process.	• Business Rules • Travel Service Provider • Offer	This term is inherited from IT2Rail	
Critical Product	It is a product that is absolutely required to achieve an itinerary. Without a critical product, the travel cannot be purchased.	• Trip	This term has been inserted in S2R-IP4 ontology but only as a constant not depending on the passenger for the moment. It must be changed in the next steps of the project.	• TicketStructure

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Customer	Role of a Person who makes the payment for an offer and is a party (a person or an organization) to a contractual agreement concluded with a Transport Service Provider. The Customer performs a mobility request, selects one or several segments to create their trip and pays for their booking(s).	• Offer	This conceptual term has been inherited from IT2Rail	• UserExtension
Departure	A Departure is a Transport Event, occurring, or planned to occur at a specific Departure Date Time and Stop Place.	• Travel Episode • Departure Date Time • Panned Departure • Origin	This term is inherited from IT2Rail	• LegStart • LegBoard • StopPlace • Call
Departure Date Time	The date and time values associated with the Departure which marks the actual and/or planned start of a Travel Episode.	• Departure	This term is inherited from IT2Rail	• ServiceTime • AimedDepartureTime • ExpectedDepartureTime • TimetabledTime
Destination	A Destination is a Location marking the logical end of the Itinerary.	• Arrival • Stop Place	This term is inherited from IT2Rail	• LegAlight • LegEnd

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Effective Time	Is the duration of segment	• TravelEpisode	• This term has been inherited from IT2Rail. • Regarding exchange of data, it is described into the field duration inside the related entity TravelEpisode.	• Duration
Fare Policy	Is the set of items describing the price paid by the customer. It includes among other things: taxes, fees and other debited or credited amounts. It is a set of rules, regulations and principles for Fare Products.	• Fare Product	This term is inherited from IT2Rail	• Ticket-Price
Fare Product	Is a set of FareRule(s) and parameter(s) which are applied together. Allows the use of a TransportService. Is instantiated in a Token when issued	• Product • FareRule • Token • TransportService	This term is inherited from IT2Rail	• TripFaresResultStructure
Fare Type	Category of product dedicated to transportation.	• Fare Product	This term is inherited from IT2Rail	• OfferItemType

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
FareRule	Is a description of how to compute the Price, validity and consumption of a FareProduct offered on a TravelEpisode	• Price • FareProduct • TravelEpisode • BusinessRule	This term is inherited from IT2Rail	• BusinessRule • AppliedBusinessRule
Fee	An amount of money paid for a particular right or service.	• Tax • Price • TravelEpisode • Offer • OfferItem	This term has been included in S2R-IP4 ontology. Regarding exchanges of data, it is described with an entity Tax	• Ticket-Price
GeoCode	The GeoCode represents the geographical position of a location with the values for altitude, latitude, and longitude.	• Stop Place • Stop Point	This term is inherited from IT2Rail (GeoCoordinates). But in S2R-IP4 ontology, it has been changed into a new entity for exchanges.	• GeoPosition
Global Quotation	Total quotation of an Offer.	• Price • Tax • Offer • Quotation • AncillaryService	This term has been inherited from IT2Rail conceptually but in S2R-IP4 ontology and regarding exchange of data, it is described in the fields Price and Tax inside the related entity Offer.	• Prices

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Guaranteed Price Offer	Is an Offer where all booked Offer Item(s)'s Price(s) are guaranteed by the provider(s).	• Provider • Price • Offer • OfferItem • Tax • AdditionalInfo	This term has been inherited from IT2Rail but in S2R-IP4 and regarding exchange of data, it is described into a field inside the related AdditionalInfo entity.	
Identification	Recognition of a Customer or a Passenger in order to provide him with a personalized process.	• Passenger	This term has been inherited from IT2Rail. Regarding exchange of data, it is described with fields inside the related entity Passenger as for each provider (code) as a unique user in the environment (docId + docType).	• UserId
Itinerary	An itinerary defines the Departure and Arrival places and associated Departure and Arrival times used for the realization of a travel. An itinerary is a set of non-overlapping journeys.	• Offer • Departure • Departure Date Time • Arrival • Arrival Date Time	This term has been inherited from IT2Rail.	

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Journey	A Journey is a collection of consecutive Travel Episode(s)	• TravelEpisode	This term has been inherited from IT2Rail.	• Trip
Journey Planner	A Service that, given a mobility request, returns an itinerary or a part of it.	• Travel Service Provider • Mobility Request • Itinerary	This term has been inherited from IT2Rail but only conceptually.	
Key Performance Indicator (KPI)	Indicator measuring the performance of an organization on a specific task.		This term has been inherited from IT2Rail but only conceptually.	
Location	A specific position or point in physical space. Location has geographical coordinates. It could be a Stop Point, a Stop Place, a Point of Interest or an Address.	• StopPlace • Address • Departure • Destination • Arrival	This term has been inherited from IT2Rail.	• Location
MetaJourney	Is the couple Origin and Destination requested by the end-user, realized by Meta-Route Network.	• Meta-Route—Network	This term has been inherited from IT2Rail.	

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Meta-Route-Network	Network representing Stop Places and route links joining these Stop Places. The meta-route network is defined for a given zone (Europe, Berlin's agglomeration, …) and based on schedule data which is provided by each TSP.	• Stop Place • Zone • Schedule • Travel Service Provider	This term has been inherited from IT2Rail.	
Mileage	Is the number of miles covered.	• TravelEpisode	This term has been included in S2R-IP4 ontology but regarding exchange of data, it was used in IT2Rail.	• distance
Mobility request	The Traveller's query for travel information. It consists at least of an origin and a destination and a date and time (for arrival or departure).	• Traveller • Preferences • Travel	This term has been inherited from IT2Rail.	• TripRequestStructure

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Offer	An Offer is a collection of OfferItems associated with a specific itinerary chosen by the traveller.	• Passenger • OfferItem. • StopPlace	• In IT2Rail exists various concepts related to it, e.g. bookedOffer. Those concepts have been kept from the glossary of S2R-IP4. • In S2R-IP4 ontology, regarding exchange of data, it has been simplified in this unique entity where the stage of the process is described into the status field instead of describing it by different terms.	• TripFaresResultStructure

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
OfferItem	An OfferItem is the smallest bookable part of an Offer bound with a specific Travel Service Provider. The collection of OfferItem composes an Offer for an itinerary.	• Additional Information • Provider • Entitlement • Travel Episode • Offer	• In IT2Rail exists various concepts related to it, e.g. ItineraryOfferItem. Those concepts have been kept from the glossary of S2R-IP4. • In S2R-IP4 ontology, regarding exchange of data, it has been simplified in this unique entity where the stage of the process is described into the status field instead of describing it by different terms.	• TicketStructure • OfferItemTicketExtension
Origin	An Origin is a Location marking the logical start of the Itinerary or of a travel segment.	• Stop Place • Departure	This term is inherited from IT2Rail.	• LegBoard • LegStart

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Passenger	Using the Personal Application on the internet enabled device or physical tokens access to the transport network; they go from a point A to a point B through one or more Transport Service Providers vehicles. In Trip Tracking, the Passenger uses the PA to activate or deactivate the tracking of the passenger's trips or sets the tracking related preferences.	• Preference • Trip • Notification	This term is inherited from IT2Rail and partially updated in order to adapt it to the new concepts in the S2R ontology.	• FaresPassenger
Planned Arrival	Refers to arrival information, which is planned before travelling, such as: date, time, Stop Place.	• Arrival	This term is inherited from IT2Rail conceptually but in S2R-IP4 ontology regarding exchanges of data it is described in the related fields into the properly entity (Offer or Travel Episode)	• LegAligth • LegEnd • ServiceTime • AimedArrivalTime • TimetabledTime

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Planned Departure	Refers to departure information, which is planned before travelling, such as: date, time, Stop Place.	• Departure	This term is inherited from IT2Rail conceptually but in S2R-IP4 ontology regarding exchanges of data it is described in the related fields into the properly entity (Offer or Travel Episode).	• LegBoard • LegStart • ServiceTime • AimedDepartureTime • TimetabledTime
Point of Interest (POI)	POI is a Location that holds relevant information for a travel or which may be of Interest for a traveller during his journey.	• StopPlace • Location	This conceptual term has been inherited from IT2Rail.	• PointOfInterestStructure
Preference	The Traveller-related information that represents the travel-related needs.	• Passenger • Contextual Preferences	This term is inherited from IT2Rail ontology but it was not used in its (IT2Rail) environment exchanges.	• Preferences • TripParamStructure
Price	Is the monetary value for a Product.	• Price • Tax • TravelEpisode • OfferItem • AncillaryService • Offer • Product • Passenger • Provider	This term has been inherited from IT2Rail.	• Price

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Product	Is a travel-related, purchasable Service or Good supplied by a service provider.	• TravelEpisode • OfferItem • Offer • Provider • Passenger	This term has been inherited from IT2Rail but only conceptually.	
Product Owner	A Product Owner creates Fare Products, fixes the Fare Rules (terms and conditions) attached to them used in the computation of the Fare Price. It can be a Transport Service Provider or Travel Service Provider (Tour Operator).	• Product • FareProduct • FareRule • Price • Transport Service Provider • Travel Service Provider	This term has been inherited from IT2Rail but only conceptually.	
Product Provider	Is contractually responsible for providing a Product to the Traveller.	• Product • Service Provider • Traveller	This term has been inherited from IT2Rail but only conceptually.	• OperatorCodeType • TravelExpertId

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Profile Connected Preferences	This is a list of personal characteristics of a user among which we can include some “stable” preferences, which are tailored by the permanent features of the customer, in the sense that they can be modified, but at a low rate (Years) (e.g. Vegetarian food, Diabetic diet, …). There preferences are permanently connected to the user (e.g. if he/she is on a wheel chair he/she prefers an elevator vs. an escalator).	• Preferences • Traveller	This term has been inherited from IT2Rail	• Preferences

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Provider	A Travel Service Provider (TSP) is a company providing travel services. TSP includes the transportation (on-board vehicles) and possibly services that are not transport but connected to it – either at the beginning or during the travel, like the access to a lounge or trip tracking – or at the end of the trip, like the access to after sales services.	• Trip • Transport Mode • Transportation Service • Transport	In IT2Rail exists various concepts related to it (e.g. Booking Provider). Those concepts have been kept from the glossary of S2R-IP4. In S2R-IP4 ontology, regarding exchange of data, they have been simplified in this unique entity where main differences are described in its related entity called additional Info.	• OperatorCodeType • TravelExpertId
Quotation	Pricing of the offer	• Offer • Price • Tax • Passenger	This term has been inherited from IT2Rail.	• Prices
Reference	Data linked or related to other one.	• TravelEpisode	This term has been inserted in S2R-IP4 ontology in order to use it for including needed additional information that has not been managed yet. In IT2Rail, it was used into exchanges of data.	• TravelEpisodeValidity • TravelEpisodeId

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Retailer	A retailer is an organization selling the Products of Travel Service Provider(s) using the services of Distributors. A retailer may have a direct relationship with a TSP whereby it acts as an appointed agent and/or it may have an indirect relationship with a TSP whereby it uses the services of a Commercial Distributor. A TSP can play the role of a retailer.	• Product • Travel Service Provider	This term has been inherited from IT2Rail	• OperatorCodeType • TravelExpertId
Route Link	An element of a Route that connects a pair of contiguous Stop Place(s) of the Route that will be performed with a vehicle.	• Travel Episode	This term is inherited from IT2Rail.	• TripLeg • LegExtension
Sales Condition	Is a subset of terms and conditions specifying the conditions to be allowed to book an OfferItem.	• OfferItem • AdditionalInfo • Provider	This term has been included conceptually in S2R-IP4 ontology but, regarding exchange of data, it is inherited from IT2Rail.	

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Schedule	Transportation schedules, such as airline timetables, train schedules, bus schedules, and various public transport timetables are published to allow commuters to plan their travels. A schedule lists the times at which certain events, such as arrivals and departures at a transportation station, are planned to take place.	• Transport • Transport Mode • Travel • Arrival • Departure	This term has been inherited from IT2Rail	• StopEventResultStructure
Search Options	Among the Contextual Preferences there are still some possible choices left, which can be selected by the Traveller on a per-travel instance (e.g.: “hand_luggage_only”, …). These preferences can be selected by the user from a drop-down menu, where only a few residual possibilities are displayed, when planning or booking the travel (e.g.: “hand_luggage_only” can be meaningful only if the context is “airplane”).	• Preferences • Traveller • Travel	This term has been inherited from IT2Rail	• TripParamStructure

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Service Provider	Role of an Organization offering Service(s), especially but not exclusively on transportation.	• Provider • Travel Service Provider • Transport Service Provider	This term has been inherited from IT2Rail	• OperatorCodeType • TravelExpertId
Stop Place	Is an element of the Infrastructure where Vehicle(s) may stop and where Traveler(s) may board or leave Vehicle(s). In most of the cases, a stop place has means to control the access to the transportation system.	• Destination • Origin • Travel Episode • Stop Place Type • GeoCode • Travel Episode End Point	This term is inherited from IT2Rail.	• StopPlace
Stop Place Type	Indicates the type of transport that starts and arrives in a stop place.	• Stop Place	In IT2Rail it was defined as a concept for each stop place (e.g. Airport). In S2R-IP4 glossary is kept these IT2Rail concepts. In S2R-IP4 ontology (exchange of data), it has been simplified in the same concept with a list of possible values (type within stop place).	• Mode

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Stop Point	The physical point at which passengers board or alight from Vehicle(s).	• Travel Episode • GeoCode	This conceptual term has been included in S2R-IP4 ontology.	• StopPoint
Tax	Part of the Price of a Travel related to charges and duties.	• Offer • OfferItem • TravelEpisode • Price • Quotation	This term has been included conceptually in S2R-IP4 but regarding exchanges of data, it is inherited from IT2Rail.	• VatRate
Terms and Conditions	Terms and Conditions refer to the rules and provisions that can be applied to any type of product.	• Offer • OfferItem • AncillaryService • AfterSales • SalesConditions • TravelEpisode • Provider • Passenger	This term has been inherited from IT2Rail	• InfoURL
Ticket	An artefact covering entitlement, embodiment and token.	• Embodiment • Entitlement • Token • Payload	This conceptual term has been inherited from IT2Rail.	• TicketStructure • OfferItemTicketExtension • OfferItemContext

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Ticket Time Limit	Time limit by which entitlement generation must occur before that inventory synchronization is un-done, and the requested capacity/availability lost.	• Entitlement • Token • Embodiment • Ticket • Payload	This term has been inherited from IT2Rail. Regarding exchange of data, this term has been included in specific field into the related entity Entitlement.	• ValidityDuration
Topology	The way in which constituent parts are interrelated or arranged.	•	This conceptual term is inherited from IT2Rail.	
Transport	A category of travel which refers to on-board vehicle travel.	• Transport Mode • Transportation Service	This conceptual term is inherited from IT2Rail.	
Transport Intelligence	All the KPIs provided to transport operators. A transport intelligence KPI could also be a travel intelligence KPI and vice versa. The two types of KPIs are not mutually exclusive.	• Transportation Service	This conceptual term is inherited from IT2Rail.	

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Transport Mode	Identifies the type of transportation for a specific segment offered by the travel service provider.	• Provider • Transportation Service	In IT2Rail it was defined as a concept for each transport mode (e.g. Air transport mode). In S2R-IP4 glossary is kept these IT2Rail concepts. In S2R-IP4 ontology (exchange of data), it has been simplified in the same concept with a list of possible values (type within Provider related to Offer Item).	• Mode
Transport Networks	A transport network refers to a group of lines of one or more transport modes, within a geographical territory, provided by one or more companies and depending upon a local transport authority.	• Transportation Service • Transport Mode	This conceptual term is inherited from IT2Rail.	

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Transport Service Provider (TSP)	Organization providing both services and means for journeys using one or more modes of transports: aircrafts, trains, metros, coaches, buses; or possible other services connected to the journeys (e.g. trip tracking). A Transport Service Provider can also be seen as a specific case of Travel Service Provider (see below) which is only responsible to the journeys. A Travel Service Provider is a company providing travel services. Travel includes “transport” (on-board vehicles) and possibly services which are not transport but connected to it – either at the beginning or during the travel, like the access to a lounge or trip tracking – or at the end of the trip, like the access to a sky resort. The Travel Service Provider offers the customers its Products (including Fare Products) for purchase (through Travel Shopping and Ticketing). It is also responsible for the travel service corresponding to the purchased offer.	• Provider		• OperatorCodeType • TravelExpertId

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Transportation Service	Service (Flight, Rail ...) that provides transportation on a Travel Episode.	• Transport Mode • Provider • Travel Episode	This conceptual term has been inserted in S2R-IP4 ontology. Regarding exchange of data, it is inherited from IT2Rail and inserted in a specific field into the related entities Provider and Travel Episode.	• ServiceSectionStructure
Travel	Generic term without any technical assumptions, referring to the combination of services provided to a customer between a physical origin and a physical destination. Travel includes transport (on-board vehicles), as well as possible transfer between modes, possibly services which are offered during the trip out of vehicles, and possibly non-transport services which are proposed at either end of the trip from A to B.	• Trip • Journey • Itinerary	This conceptual term is inherited from IT2Rail.	
Travel Data	Generically, any information related to travels.	• Travel	This conceptual term has been inherited from IT2Rail	

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Travel Episode	Part of itinerary, characterized by Departure and Arrival, consisting of an ordered sequence of Route Links operated with the same vehicle.	• Departure • Arrival • Stop Place • Stop Point • Route Link • Trip • Transportation Service • Travel Episode End Point • Mileage • Duration	This term is inherited from IT2Rail but it has been modified in order to summarize the whole information itself instead of using other entities.	• TripLeg • LegExtension
Travel Episode Endpoint	A Travel Episode Endpoint is a Stop Place at which a Travel Episode starts or ends.	• Stop Place • Travel Episode	This term has been inherited at conceptual level from IT2Rail but regarding exchange of data, it has been deleted and linked directly to the Stop Place in order to simplify the ontology in S2R-IP4.	• LegEnd • LegAlight

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Travel Expert	Technical entity that renders services to allow building an offer. This entity may be deployed by a TSP or distributor thus relying on a TSPs fare products and prices services.	• Provider • Travel Solution • Traveller	This conceptual term has been inherited from IT2Rail.	• OperatorCodeType • TravelExpertId
Travel Intelligence	All the KPIs provided to travellers. A travel intelligence KPI could also be a transport intelligence KPI and vice versa. The two types of KPIs are not mutually exclusive.	• Transport • Travel • Passenger • KPI		
Travel Solution	Solution provided to the customer answering its travel need.	• Passenger • Offer • Travel • Itinerary	This conceptual term has been inherited from IT2Rail.	• TripResultStructure
Travel Solution Aggregator (TSA)	Is a module for the calculation of itineraries and offers which interact with the IF – Broker to interface with TSPs. The TSA splits the mobility request of the traveller into parts per TSP and combines the responses in order to fulfil the mobility request.	• Travel • Mobility Request • Traveller • Travel Solution	This conceptual term has been inherited from IT2Rail	

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
Traveller	The Traveller (see also "Passenger" when on-board a vehicle) is the person making a travel in accordance with the terms and conditions of the entitlement(s).	• Passenger • Offer	This conceptual term has been inherited from IT2Rail.	• UserExtension
Traveller Preferences	All information related to a customer or a traveller, which can be used by the travel solutions (fidelity program, PRM, preferred carrier, preferred Transport Mode, preferred payment means, needed facilities, etc.).	• Preferences • Passenger • Travel		• Preferences
Trip	A set of linked segments of an offer. However, for tracking a trip, the offer is not necessary.	• Travel Episode • Provider • Partial Trip Tracker • Passenger • Subscription • Impact • Tracking Orchestrator	This conceptual term has been inherited from IT2Rail.	• Trip

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
UniqueID	This identifies unambiguously a person in the whole Shift2Rail ecosystem.	• Passenger	This term has been inherited from IT2Rail but regarding exchange of data, it is described in two fields (docType and docId) inside the passenger entity.	• UserId
Unlimited Supply Product	A Product whose supply is not constrained by the Product Provider and is assumed to have unlimited Availability.	• Product • Provider • Ticket Time Limit • Offer • OfferItem • TravelEpisode	This conceptual term has been inherited from IT2Rail.	
User Interface	What the user is able to see and interact with.		This term has been inherited from IT2Rail.	
User Preferences	A set of characteristics representing the user needs and choices for traveling.	• Preferences • Traveller • Travel	This term has been inherited from IT2Rail.	• Preferences

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
UserID	A unique string of characters identifying a specific user. This unique identification is helpful to identify a user for different kinds of operations and on each of his devices.	• Passenger	This term has been inserted conceptually in S2R-IP4 ontology but it has been inherited from IT2Rail regarding exchange of data.	• UserId
UUID	Universally Unique Identifier: see UserID.			
Vehicle	Is a machine that transports Passenger(s) during a TravelEpisode	• Passenger • TravelEpisode		• VehicleCodeType
Versioned Operational Parameter	Set of parameters used by a TSP to build its Offer Item, referring to Fare Product and Fare Rules and Topology.	• Preferences • Provider • Fare Product • Fare Rules	This term has been inherited from IT2Rail.	
Wallet	Technical component that will store customer / traveller preferences, itineraries and entitlements.	• Offer • Entitlement • Passenger • TripPreferences	This term has been inherited from IT2Rail.	

Term	Description	Relations	Terms described in S2R and its relation with other ontologies	Representation in TRIAS
WishedArrivalDate	ArrivalDateTime desired by the Customer.	• ArrivalDateTime	This term has been inherited from IT2Rail.	• DepArrTime
WishedDepartureDate	DepartureDateTime desired by the Customer.	• DepartureDateTime	This term has been inherited from IT2Rail.	• DepArrTime
Zone	A set of stop places sharing a common set of business rules.	• StopPlace • Location	This conceptual term has been inherited from IT2Rail.	• FareZoneStructure

4. CONCLUSION

This document has been describing the Co-Active WP1 Travel Shopping Ontology. It will be further developed within the next CFM project called “MaaSive”.

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