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Exploitation model

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GET SERVICE

SEVENTH FRAMEWORK PROGRAMME

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History of Deliverable

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1.1 version	Chapter on exploitation plans added; questionnaire added.
1.2 version	Extended chapter on exploitation plans; added links to presentations on exploitation plans

Contents

Table of figures

Explanation of abbreviations used in document	
4C	Cross Chain Control Centre
4PL	Fourth Party Logistics
AIS	Automatic Identification System
CargoIMP	Cargo Interchange Message Procedures
CS	Community System
DC	Distribution-center
EDIFACT	Electronic Data Interchange For Administration, Commerce and Transport
EWSP	European-wide Service Platform
FTL	Full Truck Load
GDSN	Global Data Synchronisation Network
IPCSA	International Port Community Systems Association
LSP	Logistics Service Provider
LTL	Less than Truck Load
PCS	Port Community System
SaaS	Software as a Service
SD	Service-dominant
sFTP	secure File Transfer Protocol
STE	Single Transport Executor
TSP	Transport Service Provider
XML	Extensible Markup Language

1 Executive summary

The European transportation ecosystem faces a major challenge in a globalizing world, where the demand for transport capacity is ever increasing. It has to ensure that the transportation demand can continuously be met, while mitigating the strain that this puts on:

- the transportation infrastructure;
- the environment, due to the emission of toxic byproducts and CO2; and
- the productivity of European transportation companies and society in general, due to traffic congestion.

Particularly problematic is the (increasing) environmental impact of the transport sector. In Europe, "transport is the most problematic emitting sector, with upward emission trends" (European Environment Agency, 2009). Between 1990 and 2007, CO2 emissions from transport rose by 29% in Europe. Road transport accounts for a sizable portion of CO2 transport related emissions, nearly 73% in 2000 (Fuglestvedt et al., 2008).

The increasing transportation demand is nearing the limitations of what the transportation infrastructure can handle. Improvements to the infrastructure (such as building wider roads) are not a sustainable solution for this problem, which is apparent from yearly increasing traffic congestion levels. In addition, improving the infrastructure is not the final answer to decreasing CO2 emission, as it does not decrease the number of kilometers driven.

Since no significant decrease of transport demand is expected, and infrastructure improvements are not a sustainable solution for reducing the strains on the infrastructure, the environment and the society, other, innovative ideas are needed that focus on the effectiveness of the transport process itself. To establish effective, efficient and therefore green transport, all actors involved in the supply chains have to collaborate. An integral view on planning, alternative intermodal options and actual operations is needed, combined with real-time events, both internal and external. All these improvements require a higher degree of information-sharing capabilities.

The establishment of this cooperative environment, in which all actors share all relevant information, is difficult to achieve, because of the diversity of both market and IT characteristics.

Existing Community System providers play a vital role in establishing connectivity between all actors in different types of supply chain. These providers have a profound knowledge of supply chains, and also of the dependencies between these chains. Because of this aspect, these parties are able to create the much needed integral view on planning and operations. This capability is further increased by their actual coverage of already connected actors to their centralized system (one-stop-shops)

Moreover, Community System providers establish trust, which is essential for the sharing of information across different supply chains. Because of their neutral role, they will do not take planning decisions or corrective actions in the operations. Information that is exchanged through these Community Systems is safeguarded, the information is only shared after the explicit approval of the owner of the information. In most cases, the business model of these operators is cost-based (not-profit).

Within the context of the GET Service project, the need for a collaborative approach is more than present:

The GET Service project will advance current transportation and route planning systems to the next major level, by: empowering transport management and route planning systems with information from multiple sources; and enabling the incorporation of transportation-related tasks into transportation planning.

This quote from the website of the GET Service project reveals that the project acknowledges the fact that multiple information sources exist and actors need to exchange this information. These sources should be able to do so, and even more importantly, willing to do so. This willingness is present (– or forced upon) when the actors have direct insight in their own supply chains, or when the actors have long-term contracts. But when the supply chains changes, and becomes more agile (short-term, loose partnerships), which is within the aim of the GET Service project, the sharing of information is often perceived as a risk instead of an opportunity.

The GET Service project wants to emphasise these opportunities by providing guidance to the actors involved. This document delivers an approach for creating business models that can be used by all actors involved in the supply chain. These business models help the market companies in establishing exploitation models that are better suited to the cooperative environment that GET aims to achieve, while preserving their own vital interests. The exploitation model covers aspects such as market and IT characteristics, the network-centric character of logistics, existing positions and roles, and the demand for trust and the wish for more flexibility in transport options.

The BASE/X framework from the TU/Eindhoven is used as the foundation for these exploitation models, because it fits the abovementioned requirements well.

Based upon this framework examples of strategies and business models have been developed for the GET Service project and several of its project partners. These models are clearly linked to the role models and architecture as delivered in Work Package 2 of the GET Service project. These examples provide valuable insights into how organizations, clients and providers of transport, IT systems, and community systems can cooperate and establish new business services that are aimed at a flexible, dynamic and green transportation sector. The business models provided in this deliverable can be further quantified at a later stage. The financial ‘numbers game’ is not included in this exploitation model.

The design of the distributed GET architecture combined with the GET exploitation model is generic, and can be fitted to the entire European transportation domain. It allows all actors involved selecting their trusted partners; their business services can be adapted to different geographical areas and transport domains, while reusing the same shared reference architecture and exploitation model foundation. This approach is also recommended for the market adoption and exploitation model of European-wide Service Platform.

2 Introduction

To establish effective, efficient and therefore green transportation, all actors involved in the supply chains need to collaborate. Supply chains need to be flexible. An integral view on planning, alternative intermodal options and actual operations is needed, combined with real-time events, both internal and external. Information-sharing is required throughout the entire (European) transport and logistics domain.

Due to several market characteristics, collaboration and open information sharing is hard to establish. A new exploitation model is needed, network-centric and service dominant, so that flexibility of supply chains can be established, with respect to the existing positions and interests of the actors involved.

The exploitation model needs to be generic, so that it can be used as a blue-print for the European-wide Service Platform and other European projects investigating IT service offering for the transport and logistics domain.

2.1 Project Goal

The GET Service platform provides transportation planners with the means to plan transportation routes more efficiently and to respond quickly to unexpected events during transportation [1]. To this end, it connects to existing transportation management systems and improves on their performance by enabling sharing of selected information between transportation partners, logistics service providers and authorities. In particular, the GET Service platform consists of components that:

(i) enable aggregation of information from the raw data that is shared between partners and transportation information providers;

(ii) facilitate planning and re-planning of transportation based on that real-time information; and

(iii) facilitate real-time monitoring and control of transportation, as it is being carried out by own resources and partner resources. By providing this functionality, the GET Service platform aims to reduce the number of empty miles that is driven, improve the modal split, and reduce transportation times and slack, as well as response times to unexpected events during transportation. Thus it reduces CO_2 emissions and improves efficiency.

2.2 Work package Goal

In work package 8 of this project, the objective is the dissemination of the project utilizing various means of communication and targeting varying external audiences. The following tasks are included:

- Task 8.1: Website creation
- Task 8.2: Dissemination
- Task 8.3: Exploitation

2.3 Deliverable Goal

This deliverable is part of task 8.3 - Exploitation. An important part of the exploitation plan is the development of a business model for the GET Service platform. The business model must ensure profitability of the platform itself, (route planning) services that are built on top of the platform and information provisioning services. In the Description of Work it is stated that the exploitation of GET Service first and foremost focuses on the exploitation of the platform itself and to a lesser extent to exploiting other results of the project, including the CO2 measurement instrument, the reconfigurable orchestration engine and the transportation domain specific service development support.

The first goal of this deliverable is to create an exploitation model for the GET Service project and its project partners, combined with examples on how to create network-centric strategies and business models, thereby visualising the value-in-use of the provided solution. This provides valuable insights in how organizations, clients and providers of transport, IT service providers and community systems can establish services for exchanging information in order to create a flexible, dynamic and green transportation.

The second goal of this deliverable is to explain how this exploitation model fits the European-wide Service Platform.

2.4 Approach

For the development of the exploitation model for GET Service, the BASE/X business engineering framework is used. This framework has been developed by the TU/Eindhoven together with leading industry partners of the University [2].

2.5 Deliverable structure

The remainder of the deliverable is structured as follows:

Section 3 describes the current issues in information-sharing in transportation, in relation to the context of GET Service. It presents how agility in transportation and business modelling, in combination with service dominant strategies can lead to the needed flexibility to establish synchro-modal and green transportation. Section 4 describes the BASE/X framework, which is used for the exploitation modelling. Section 5 provides the strategy canvasses of all roles in the GET Service context. Section 6 is on the customer identification for the Core platform operator and the client platform operator. This identification shows that other roles are integrated in the business models. Section 7 provides examples of two business models of the Core platform operator. Section 8 provides business models as well, now for the demonstrator cases of the GET Service project. Section 9 presents the conclusions of this deliverable.

3 Information-sharing in logistics

Since no significant decrease of transport demand is expected, and infrastructure improvements are not a sustainable solution for reducing the strains on the infrastructure, the environment and the society, other, innovative ideas are needed that focus on the effectiveness of the transport process itself. To establish effective, efficient and therefore green transport, all actors involved in the supply chains have to collaborate. An integral view on planning, alternative intermodal options and actual operations is needed, combined with real-time events, both internal and external. All these improvements require a higher degree of information-sharing capabilities.

The GET Service project aims at developing a solution to enable efficient and effective, and therefore green, transport. The project's solution offers the possibility to establish real-time planning and monitoring of transport, running through complex supply chains.

These supply chains are networks of a large group of actors, working together and / or competing. These networks can be long-term commitments (contracts, tenders) or have a short-term focus and are there for more dynamic and flexible. In most cases not all actors in a specific supply chain are aware of who is actually connected to the "own" supply chain, or who could be connected (as an alternative for transportation). Besides not knowing with who to share information, there is the factor of not willing, due to competitive motives and/or a lack of trust. Information-sharing is there for not established easily.

Besides the many actors and the diversity of types, different types of cargo are being transported. These are containerised, bulk – both liquid and dry – and special cargo; high-value and low-value goods, and everything in between for import, export and/or transhipment, maritime, air and/or continental. Each type of cargo/goods item and type of movement requires different capabilities from the logistical organisations, for instance in assets, cooperation and legislation.

This section describes the current issues in information-sharing in transportation, in relation to the context of GET Service. And how agility in transportation and business modelling, in combination with service dominant strategies can lead to the needed flexibility to establish synchromodal and green transportation.

3.1 IT service offering in logistics

IT is an important backbone in the current logistical operations for planning, administration, notifying, reporting, tracking and other purposes. Almost all actors have invested in IT and connectivity, though the maturity and reach of the implementations differ enormously from global systems (for instance deep sea lines / air lines) to local implementations and SaaS solutions, off-the-shelve services and tailor-made solutions.

In Deliverable 5.1, section 2, of the GET Service project [3] an overview of Transport Management Systems including transportation planning tools is given. A comprehensive list, which makes clear that a broad spectrum of IT service providers, with an installed base and customer databases, is present.

Connectivity between all these different solutions is becoming easier due to developments in standardization and technology, but not yet in place for a large part of the total transport and logistics domain. Deliverable 2.1 [4] points out that different standards are used in the transport market. This leads to the fact that information is present, but not shared at all or not shared with the right partners and within the needed time constraints. Due to connectivity issues and/or conflicts in competitive interests or due to simply not knowing which organisation needs what kind of information and when, as it is often not fully transparent which organisation will execute the next step in the supply chain.

One single, centralized system on European scale appears to be a solution, but will not be accepted by the business actors in the supply chains, due to specific characteristics of the transport and logistics market. These characteristics, influencing the information sharing, are provided in section 3.2 of this deliverable.

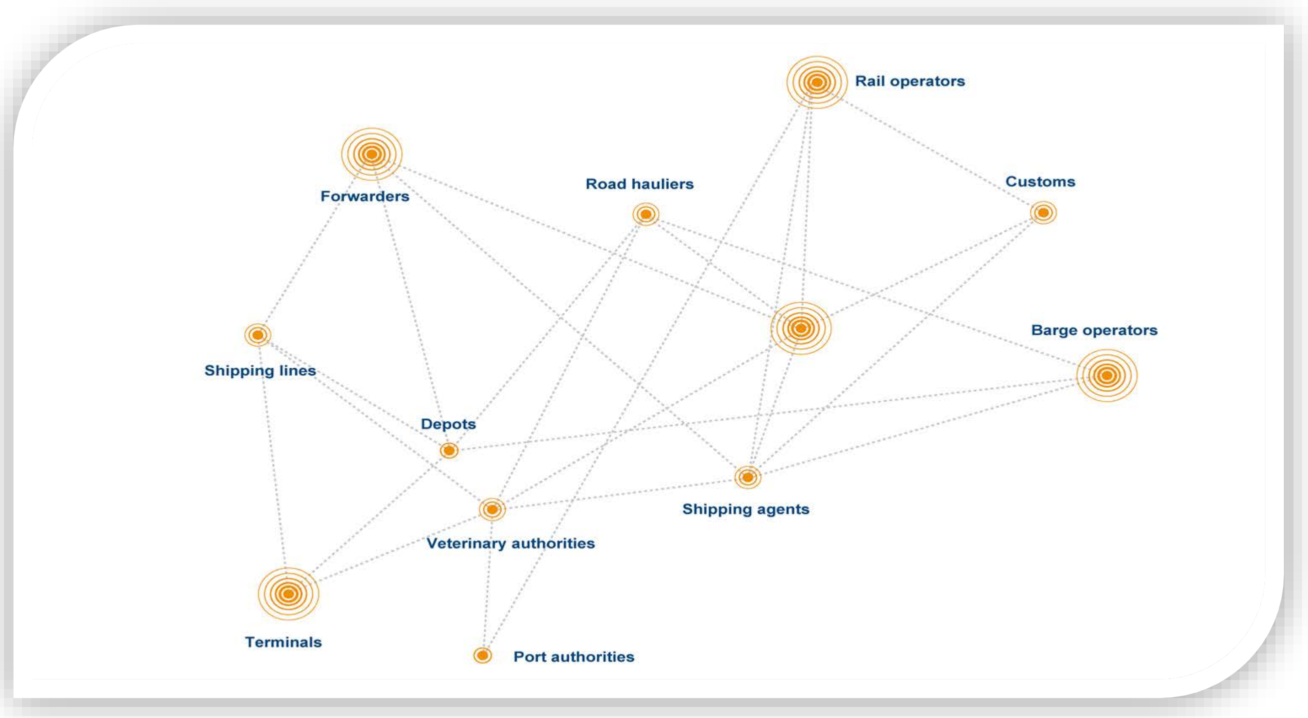


Figure 1 - Organisations in transport and logistics and their need for connectivity

3.2 Information-sharing

The transport and logistics domain is characterised by many different types of actors, both public and private. These actors are united and competing in supply chains, each fulfilling its own role and mandate.

3.2.1 Information-sharing in the private sector

In the private sector, organisations are both competing and working together in supply chains – intentional or unintentional in ordering, transporting, handling, storing and, of course, earning money. They act global (for instance deep sea lines) or local (for instance small transport companies with one truck). Fact is that there are literally thousands of organisations available in the private sector requesting and offering transport.

In the private sector two main roles exist. An organization can request transportation of goods (client); another organization can offer that same transport (provider). One organization can fulfil only one or both roles. For instance, an importer orders transport capacity at operator A. The importer is there for the client, and operator A is the provider. Operator A can order that requested transport capacity at operator B, and therefore operator A becomes a client as well. In the E-freight project [5] this was clearly explained.

The following list provides an overview of specific organisations in the private sector of the transport and logistics domain:

- Shipping lines / agents (Deep Sea, Short Sea, Feeder, Ferry)
- Air lines;
- Terminal & depot (Deep Sea and inland terminals)
- Forwarders (Logistic Service Providers)
- Transporters (barge, road, rail)
- Shippers (importers, exporters)
- Distribution-centers, cross-dock centers;
- Suppliers (e.g. pilots, bunker, traction)

These actors are not always able and / or willing to share information. Besides not knowing with who to share information (next actor in supply chain), conflicting commercial interests are the main reasons for this lack of creating connectivity and transparency.

An interesting example of not being able to share information is the division between merchant haulage and carrier haulage. These two types of governance in the supply chain show that actors can take different roles and the complexity of the supply chain.

- Carrier haulage: the shipping line is responsible for the door-to-door transport. In this type the shipping line is a transport service provider for the importer/exporter (client), and is client itself for the hinterland transport. In the port of Rotterdam 15-20% of all maritime shipments are under the carrier haulage regime.
- Merchant haulage: the shipping line is responsible for the transport overseas to the deep sea terminal in a port. From that point a Logistics Service Provider (for instance a forwarder) takes over the responsibility. The forwarder and shipping line do not have a contractual relationship. This implies that the shipping line does not know with which Logistics Service Provider to share information. In the port of Rotterdam 80-85% of all maritime shipments are under the merchant haulage regime. The Logistics Service Provider can be a 3PL (own assets, for instance trucks), or a 4PL (no own assets). As 4PL, the forwarder will be a client to operators with assets.

Other examples of not being able to share information are:

- Maturity of used IT Systems – not all organisations are equipped with mature, state-of-the-art systems, providing them with the needed connectivity, due to for instance costs and complexity;
- Differences in implementation of communication protocols as: CARGOIMP, EDIFACT, GS1 GDSN and special, custom-made protocols based on sFTP, webservices and XML;
- Organisational issues – organisations can be located in different geographical units, for instance the shipping department and the equipment control department. This distribution of resources and knowledge leads to not knowing what information should be when available or is even present in the own organisation.

Examples of reasons why actors are not willing to share information:

- Transparency towards competitors can lead to a downfall of the own competitive position (customers, tariffs, service-level agreements);
- Long-term contracts between clients and providers create inflexibility, leading to less alternatives for intermodal transport;
- Lack of transparency and inflexibility can be part of the business model of an organization (e.g. waiting times);
- Fear of “big brother” and privacy issues;
- Trust issues (who can see what data, is data safe);
- Competition between IT service providers;

3.2.2 Information-sharing in the public sector

In the public sector the organisations are responsible for safety, inspections, taxes, managing infrastructures, etc. Law and regulation differs within (local versus regional) and between countries (national versus international). Within the European Union for instance, where the Member states are able to implement the guidelines in their own legislation. This leads to differences in what is allowed, for instance the use of AIS in inland shipping for other purposes than traffic management is forbidden in the Netherlands, where it is allowed in other Member States.

The following list provides an overview of specific organisations in the public sector of the transport and logistics domain (per Member State):

- Harbour masters;
- Customs;
- Inspection agencies (e.g. Police, Veterinary inspection agency);
- Infrastructure Managers;

The public organizations do not necessarily share information amongst each other as well. Due to connectivity issues and/or legislation issues. This can lead to situations where one single transport can be investigated by different inspection agencies.

In specific cases, the Governmental organizations made it mandatory to have certain information in physical format (paper) during a transport (for instance loading lists). This has a negative effect on the business case for the private sector, when it comes to set-up electronic information sharing.

Another example of not supporting information sharing, is the fact that in specific cases the Government is not allowed to return information towards the business.

On the other hand, the business to government information flows are most of the time mandatory and must be supplied via electronic format by the business. This is an important factor in making information digitally available.

3.3 Agility in the transport and logistics domain for green logistics

To realize efficient and effective transportation leading to green logistics, agility is needed in the supply chains. Only when agility in the operations is established, synchromodal transport is a reachable option for the business actors. At this moment, not all relevant information concerning the actual status of transportation and handling is known by the responsible organizations, for instance delays due to traffic congestion and delays in handling operations at terminals or distribution centres. This leads to last-minute (or too late) arrangements of alternatives, most of the time not synchro-modal.

Alternatives in transport must be known, including information on capacity, schedules and costs, but it is of importance that alternatives can be chosen as well. Thus, besides the agility in the operations, agile business models must be in place. Actors need to be able to switch from providers of transport, not hindered by long-term contracts and/or conflicts of interest.

In order to make the operations more agile, the reasons for not sharing information as mentioned in paragraph 3.2.1 and 3.2.2 must be tackled. An integral view is needed on the service offering, planning and actual operations of all actors. Combined with internal and external events (e.g. delay in operations, infrastructure maintenance, strikes, traffic jams, weather conditions). This integral view can only be achieved when all actors share all relevant information and when this information is centrally reachable. As mentioned, having the actors share information on demand and supply of transport, combined with actual status information, control over and trust in the data exchange needs to be taken care of.

In order to establish the needed agility and there for the integral information sharing the following criteria must be met in order to have it adopted by the market:

- Actors have trust in the organizations handling their data;
    - Actors are in control of authorizing the use of the data;
    - Actors can monitor who is using the data for what;
- Actors are able to remain using own systems / systems of providers;
    - Actors are agile in their investments and are able to choose the IT suppliers;
    - Actors do not need to connect towards one centralized system covering all data;
- Actors are able to create service-dominant strategies, in which they centralize the value-in-use of the services they provide with their associated partners;
- Actors are able to develop new service and network based business models based on agility / flexibility;
    - Actors, both clients and providers, share in costs and benefits
    - Actors centralize a shared value-in-use in the business models

3.4 Integration and Community Systems

This is where integrators and community systems largely step in. These organisations are able to establish connectivity with all actors within a certain scope (for instance a port or supply chain), translate and combine different types of information and thereby creating transparency. Community systems are a special breed within the European area, as they are present in every mid-size and large sea and airport and each of them are representing large and active communities of logistical organisations.

These communities (existing out of both private and public organizations) are willing to, under pre-set and agreed-upon conditions as authorization and security, share information within these systems, in order to create a more efficient and effective supply chain. The Port Community Systems are united in the International Port Community Systems Association (IPCSA), and share knowledge and expertise [6].

The operators of the PCS's differ in their governance and shareholders (mostly the European port authorities), and business model (neutral and cost-based versus a more profit approach). What all community systems provide though, is trust. The communities trust these operators with their data, concerning cargo, planning, operations, etc. Without this trust, there is no possibility to create an overall, chain-wide connectivity, which will lead to an authorised transparency and tuning of operations and use of infrastructures (efficiency and effectiveness). Even in the case where actors are not contractual related or aware of the fact that they are cooperating in the supply chain.

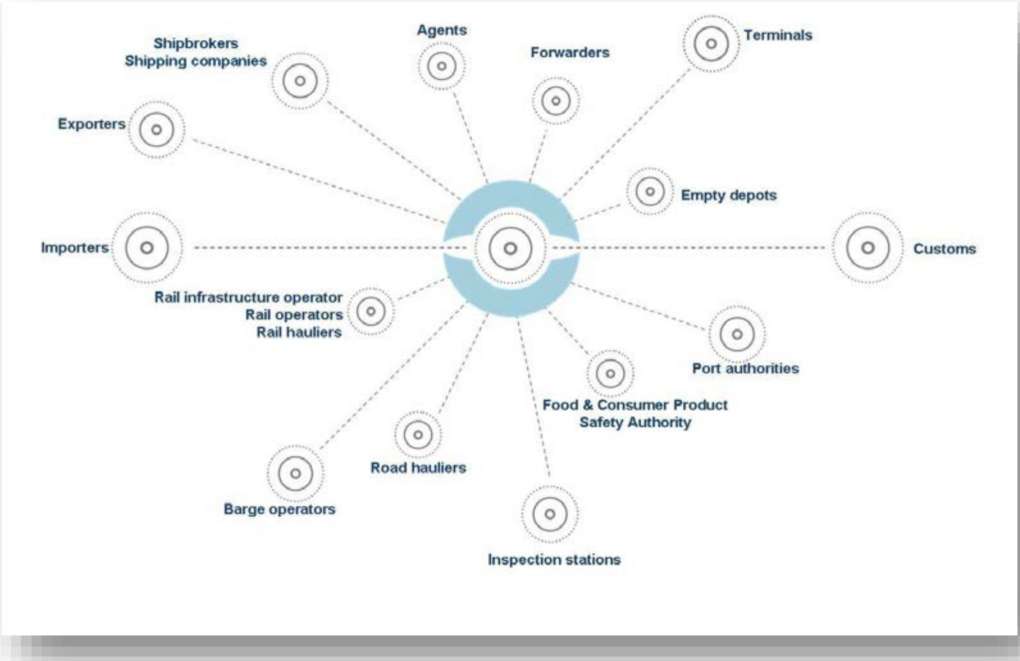


Figure 2 - Community System as central information hub (source Portbase)

In short, the Community Systems fulfil two major functions:

1. Platform provider for amongst others: authentication, authorization, (reference) data storage, registration, event handling, connectivity;
2. Service and data provider for specific domains (sea port, airport, supply chain), supported by a profound knowledge of that specific community and its context;

These two roles combined, lead towards the needed integral view. That is, in the own community of the Community System providers. Depending on the scope of the provider of the Community System the width of the integral views differs.

When it comes to the overall European domain, the regional integral views need to be combined and connected. Besides that, information on transport schedules and capacity needs to be added or at least be available, as well as information on external events (e.g. infrastructure). Complex event processing, making use of the total available dataset, will create the needed transparency and will make the operations be more agile.

3.5 Service dominance in the transport & logistics domain

In the transport and logistics domain, the emphasis has long been on the physical aspects of processes related to moving cargo. This means that the traditional focus is on operational processes and functions (such as loading, unloading, cross-docking, driving, sailing, etc.) and on the physical resources required to execute these (such as trucks, cranes, trains and ships).

Obviously, these processes, functions and resources form the physical backbone of transport and logistics, but this is not what an end-customer of transport and logistics operations is actually primarily interested in. An end-user is interested in the added value that is created by using the processes, functions and resources - the so-called value-in-use. The added value consists of a functional change in a business state (such as goods that have changed location) combined with nonfunctional characteristics that go with this state change (such as security, availability, privacy, speed, etc.) - together this forms the customer experience of the value-in-use.

These are elements of a relatively new business thinking paradigm known as service-dominant (SD) logic. The core of SD logic is to not concentrate on owning and handling physical assets, but in the value-in-use created by the use of these assets, delivered through services. This line of thinking applies very well to the GET Service context, in which added value is created through the application of services in the context of real-time, synchromodal logistics.

For this reason, we have adopted the BASE/X approach to business engineering [2], which is strongly rooted in the SD logic business paradigm. BASE/X takes value-in-use, agility, and business networking as its core components, as shown in Figure 3.

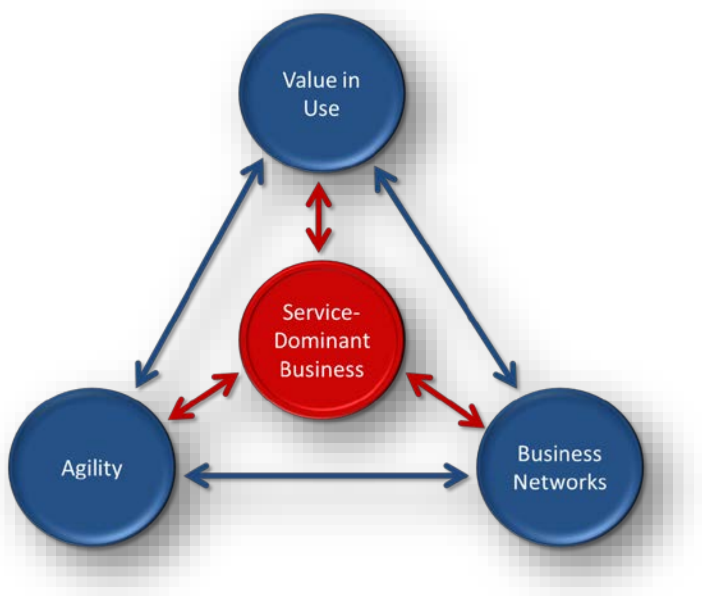


Figure 3 – core components of service-dominant business (source: BASE/X Framework)

3.6 Exploitation model requirements and the GET Architecture

If all implemented systems and functions in today's market combined are seen as one information system, it can be stated that the total information system is distributed. Every actor owns or uses a part, or component, of this system, and therefore each component needs to integrate with other ones. If this distributed set-up is not well-designed, it can lead to complex dependencies.
An unwanted effect of these complex dependencies is that it becomes increasingly difficult to connect the actors. This will results in a decrease in sharing information throughout supply chains.

Loosely-coupled distributed systems have the advantage that actors in the system can choose specific required IT services, in other words: the design allows tailor-made solutions which address the needs of that specific actor, while the impact of change of these solutions does not result in unanticipated changes within other components.

One of the major design decisions for the architecture of the GET Service platform (D2.2.1, section 6), is the decision to use a loosely-coupled distributed system. This ensures that the GET Service platform can both meet the required characteristics and that it can connect to existing systems that

are already operational and therefore represent considerable investments. Loose coupling is achieved by means of a design that promotes single-responsibility and separation of concerns.
 depicts the major and subsystem components of the GET Service architecture.

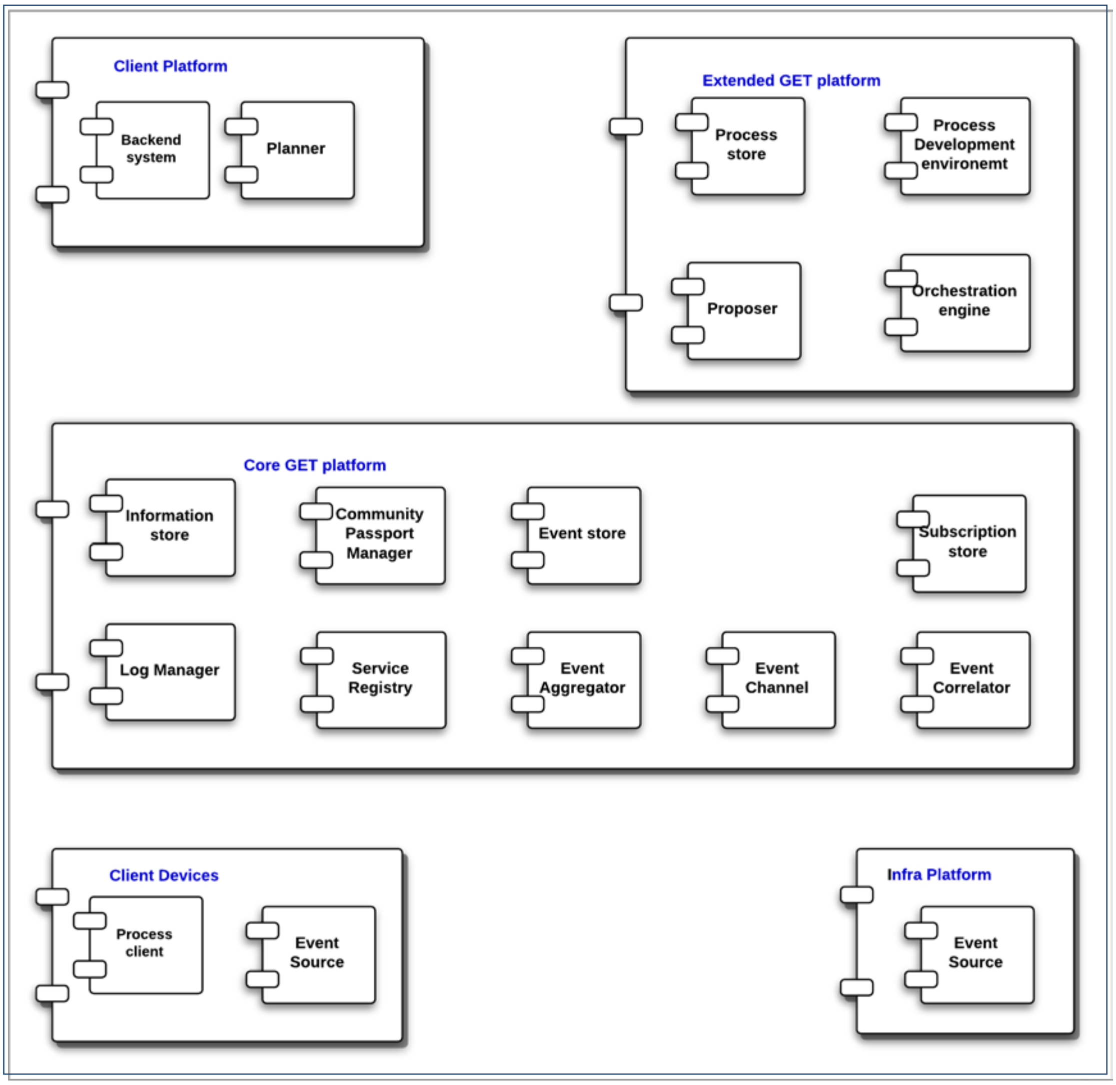


Figure 4 – Major and subsystem components of the GET Service architecture

From a business perspective, this distributed model and the underlying separation of concerns is vital, since this allows the GET architecture to support the broad spectrum of diverse market characteristics that influence the way the information exchange takes place:

- Many actors (public and private)
- Local, regional, national and international Law and Regulation which have an effect on the information need
- Different interests and competitive positions
- Many existing software solutions with installed base
- Different systems leading to difficulties in connectivity
- Maturity of IT differs strongly
- Trust (open data vs trusted data)
- Transparency issues

The GET Architecture does not use a centralized, single platform, since this impedes the use of various business models, and hence will result in a low degree of market adoption. By using a distributed model, the GET architecture supports the information exchange patterns used by the logistic parties, without the need for rearranging and rebuilding existing IT systems, thus saving valuable time and money. The major components of GET platform can have multiple implementations, which can vary according to different geographical locations or specific markets. The only exception is the Core GET platform component; it has only one instance in the scope of this project. However, the modules of the core platform can be distributed (as demonstrated in the project, where the event components run on a remote host. For reasons of feasibility within the scope of the project, the core components are not replicated, however - i.e., each module has one instance. In future, however, replication of modules can be considered to further increase the distributed character of the platform (multiple core platforms, providing for multiple constellations of services).

The design of the distributed GET architecture combined with the GET exploitation model is generic, and can be fitted to the entire European transportation domain. It allows all actors involved in selecting their trusted partners, their business services can be adapted to different geographical areas and transport domains, while reusing the same shared reference architecture and exploitation model foundation.

3.6.1 Business themes and the GET architecture

The primary justification for grouping the GET architecture components is based on the usage scenarios for the different actors as described in Deliverable 2.2.2 [7]. Another grouping aspect is the rate in which the major components can change. This rate is governed by market influences, and the architecture must be able to cope with these different rates of change. A theme has been used to describe these different rates, and the themes have been plotted on to the GET architecture by using an overlay, see figure 5.

Theme: Agility
The Client and Extended GET platform components can be adapted to specific markets and geographical areas: they are open to modification if new shared business models require so, but they can also support existing business models and interests that stay intact. This part of the architecture must be very agile, and loose coupling ensures that the Core GET functionalities can be reused in different business contexts.

Theme: **Stability**
The Core GET platform does not have any dependency on the extended GET architecture components. This allows the platform to remains stable, while different business-specific components on top can be realized by independent IT suppliers. The competitive position of these suppliers is not harmed, leading to a higher adoption degree. It also emphasizes the crucial neutral position of the Core GET platform, which is operated by a trusted third party.

Logically, the European Community Systems should be the core platforms, as they:

- Are present in most of the European ports;
- Are providing connectivity and trust (authentication, authorization);
- Already support the agility for business actors in choosing and working with own IT systems (machine to machine connectivity);
- Can provide and maintain static reference data (for instance locations, modes of transport, equipment types);
- Many actors, both public and private are connected to a CS. This implies that they all have one interface for connecting and sharing information;
- CS operators are acting neutral and are seen as a trusted party by their own community;
- CS operators are united in IPCSA, which implies that different communities throughout Europe can be connected;

- The CS operators are able to provide the needed components, as depicted in the GET architecture;

Theme: **Diversity**

In the real world the Client device and Infra platform components are implemented by a large variety of existing (on-board) systems. The GET Core platform needs to connect to these systems, without requiring any change to them. In most cases, the governance of their lifecycles takes place outside the influence sphere of the GET Service platform. The market already provides these components. Governmental organizations and Community System operators can fulfill the role of infra platforms, as they can provide data concerning the condition of the infrastructure, the planned and actual usage of the infrastructure and external conditions as weather and economics.

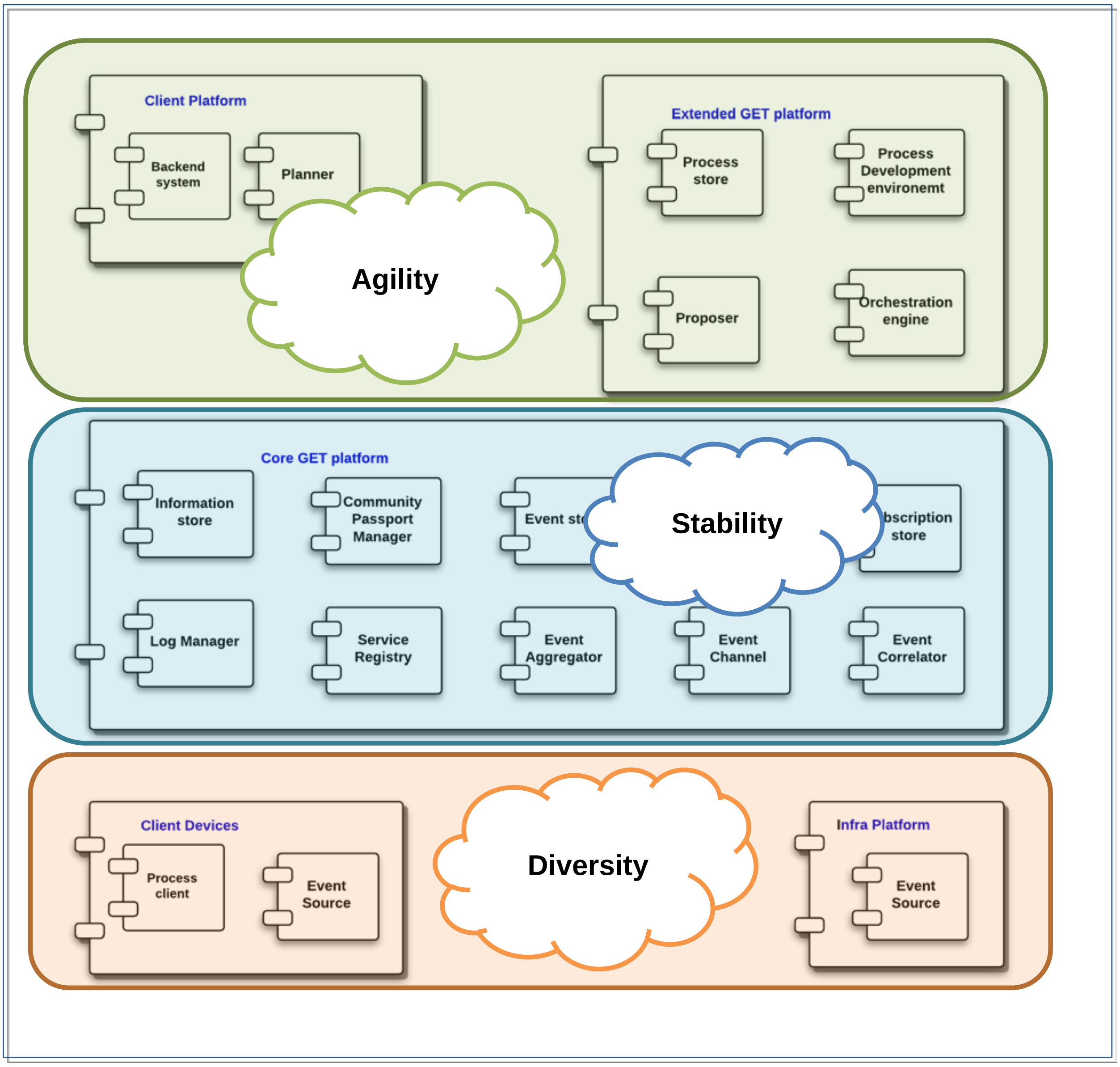


Figure 5 – Key business themes in the GET architecture

The exploitation model should be applicable for the European-wide service platform and future developments. Therefore it is of importance to note that in this chosen architecture:

- Every component can be replaced
- New components can be added
- Existing business models / interests stay intact
    - Competitive position of suppliers is not harmed, leading to higher adoption degree and the must-have neutral position of the core platform
- New shared business models can (and must) be created
- Community systems are the backbone for the European-wide service platform

3.6.2 The need for additional business roles

In deliverable D2.2.1 [8] the major roles and actors that use the GET Service have been defined by analysing the different usage scenarios from WP1. However, additional roles are required in order to set up an exploitation model. New roles are added in the scope of this WP. The distributed architecture can be used in domains where existing providers are already involved. Since these providers can actually be competitors, a conflict of interests exist. So these new roles are required, but are only used to accentuate the benefits of the exploitation model for all parties involved, and are therefore not marked as a change of D2.2.1.

The following roles are added:

1. Client Platform provider;
2. Extended GET platform provider;
3. Core GET platform provider. In the GET project this role is distributed over two roles:
    a. Core GET platform provider, providing core components on, amongst others, logging, authentication and registration;
    b. Event engine provider, providing core components for event processing;
4. Infra Platform provider;
5. Client Device provider;
    a. The device provider is the organization that provides the devices (hardware and / or software);
    b. The device operator maps to the LSP and TSP operating the vehicles in practice;
6. Technology provider. Two types of Technology Providers are distinguished, depending on the service offering:
    a. Providing build-time solutions: The providers create and offer software to be installed on the platforms and devices. This role is not an active role in the supply chains, but are partners for the mentioned platform and device providers.
    b. Providing cloud solutions: The platform and device providers (and the business roles forwarder and transport service provider) can buy services directly from these cloud providers, for instance via web services.

When developing the business models for the GET Service project, the above-mentioned roles need to be placed in the models, together with the business roles from the GET Service context, as mentioned in the GET architecture deliverables:

1. Forwarder (Logistic Service Provider)
2. Transport Service Provider

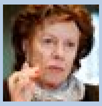
3.7 Requirements for the GET Service exploitation model

Based upon this chapter, the following requirements are of importance for developing the business models for the GET Service project. It is clear that one single platform and one central business model will not be adopted by the market. None-the-less, all organizations need to join-in, in order to establish the needed integral view and therefor the must-have agility. All organizations need to adopt a service-dominant strategy. A distributed business model is needed, based upon the service-oriented approach.

The answer to the question “What will be the business model of GET service platform?” is that there will not be just one business model. Every platform and device provider will and must have multiple business models as it needs to be agile. Furthermore:

- To establish green transportation (scope of the Get Service project), agility is needed in the operations:
    - An integral view of the transport capacity, demand and offering is needed, combined with actual data on operations, infrastructure status and external events;
    - A broad variety of organizations demanding and offering transportation and providing IT services exist and all these organizations must be included in the business models (on role level);
- In order to create the integral view, all organizations need to share information:
    - Trust must be established via the core platforms (Community Systems);
- Business models must provide agilty;
    - Switching of partners in the service-offering must be made easy, as well as business partners as IT service providers;
    - Different interests and competitive positions must be safe-guarded;
- All roles as mentioned in paragraph 3.5 must be included in the business models
- Every business actor, platform and device provider needs to define its own:
    - Strategy;
    - Business models that it is the leading partner in (other non-leading partners appear as well);
    - Service compositions (offering);
    - Business services (capabilities);

The value-in-use which will be delivered by the partners in a specific business model, is a combination of all values provided by the partners.



Neelie Kroes (@NeelieKroesEU)

02-09-14 16:26
Internet is unified but distributed: its governance should be too. Internet is open and accessible: its governance should be too #IGF2014

Figure 6 - Post on Twitter from EU Commissioner Neelie Kroes (02-09-2014)

4 Exploitation modelling approach

For the modelling of the business models, the BASE/X framework is used [2]. This framework has been developed by TU/Eindhoven, together with leading industry partners.

4.1 Introduction BASE/X

BASE/X is a business engineering framework for service-dominant business, i.e., service-oriented business that puts service management at the forefront. BASE/X covers the entire spectrum from high-level business strategy definition to business information system architecture design, including elements like business model conception, business service specification and business process modelling. The very core of BASE/X is the understanding that to achieve truly agile service provisioning business, these elements cannot be treated in isolation.

To capture networked, service-oriented business, BASE/X has two core business principles:

1. Business services and the value-in-use they deliver to customers are the primary building blocks for contemporary business design and execution.
2. To deliver integrated business services as a solution to a customer, networks of providers of basic services are required. Given the volatility of many markets, these networks must be dynamic and explicitly orchestrated. Orchestration of networks is of paramount importance.

To structure business organizations, BASE/X uses two core business engineering principles:

1. An explicit distinction is required between the stable essence of a business organization and the agile market offerings of that organization. These two elements must be explicitly co-engineered in business design.
2. An explicit distinction is required between business structures, organization structures, and information technology structures. These three elements must be explicitly co-engineered in operations design.

4.2 BASE/X versus requirements for exploitation model

The BASE/X framework fits perfectly to the market characteristics of the transport and logistics domain, the broad (existing) service offering and the related (existing) business models and (commercial) stakes, as described in section 3.4.

The network-centric character of the transport and logistics domain, as all actors cooperate and compete in their service-offering in multi-actor supply chains, is represented and emphasized in the BASE/X methodology, in contradiction to the common approach for creating business models (product-based, not service based). The BASE/X methodology emphasizes the value-in-use experience. This value-in-use is composed by all value-in-use provided by partners involved in the service offering.

The choice for this framework is in line with the chosen distributed architecture within the GET Service project, as mentioned in section 3.6. Every partner provides a platform or a component, which they offer to the market within the boundaries of their own strategies, business models and customer groups. The service the GET Service project will provide is a combined effort of all these project partners, which all contribute to a central value-in-use:

GET provides “the platform” to realize various values-in-use coupled to various business models.

The adoption of the BASE/X framework forces all partners involved in the network-centric service offering, to think of new business models. This is highly needed in the divided transport market, especially when the ambition is and should be to have transportation more efficient and effective, in other words “Green”. Supply chain partners should be able to set-up short- and mid-term business models, to gain flexibility in partnering, meanwhile understanding the composition of a shared value-in-use. These business models should be service-dominant, and therefore services and business networks should be native elements in the design of business models.

This service-oriented and partner-based exploitation model is also needed for the European-wide Service Platform, which, as GET Service, will consist out of many different (types of) users, service providers and IT building blocks and will have to deal with conflicts of interests (e.g. commercial constraints).

4.3 Building blocks BASE / X for GET Service exploitation

For the business model of GET Service, three building blocks of the BASE/X framework are used:

1. Strategy level
2. Customer identification
3. Business model level

4.3.1 Strategy level

The strategy defines the identity of an organization. The strategy is coupled to the long-term position of a business organization in a market. As the strategy is built around a mission that focuses on delivering value-in-use to its customers, it is of relevance for the GET Service exploitation to include these strategies, due to the fact that the value-in-use of Get Service is a sum of all value-in-use of all partners involved. Do all strategies fit, or are there conflicts of interest?

For this deliverable the pragmatic version of the strategy canvas has been used. This canvas contains three groups of elements.

1. The first group contains the elements that define the value-in-use that an organization wants to deliver to a market. The elements are interpreted in a general, abstract sense.
2. The middle group contains the elements that define the service ecosystem in which an organisation operates (or wants to operate). In the middle the focal organisation, for which the canvas is created, is given. On the left respectively right, the organizations that deliver core services respectively enriching services are given.
3. The bottom group contains the elements that define the way the organization manages its collaboration in the ecosystem (also a distinction between core and enriching services).

In section 5 the strategy canvasses for the GET Service roles are provided.

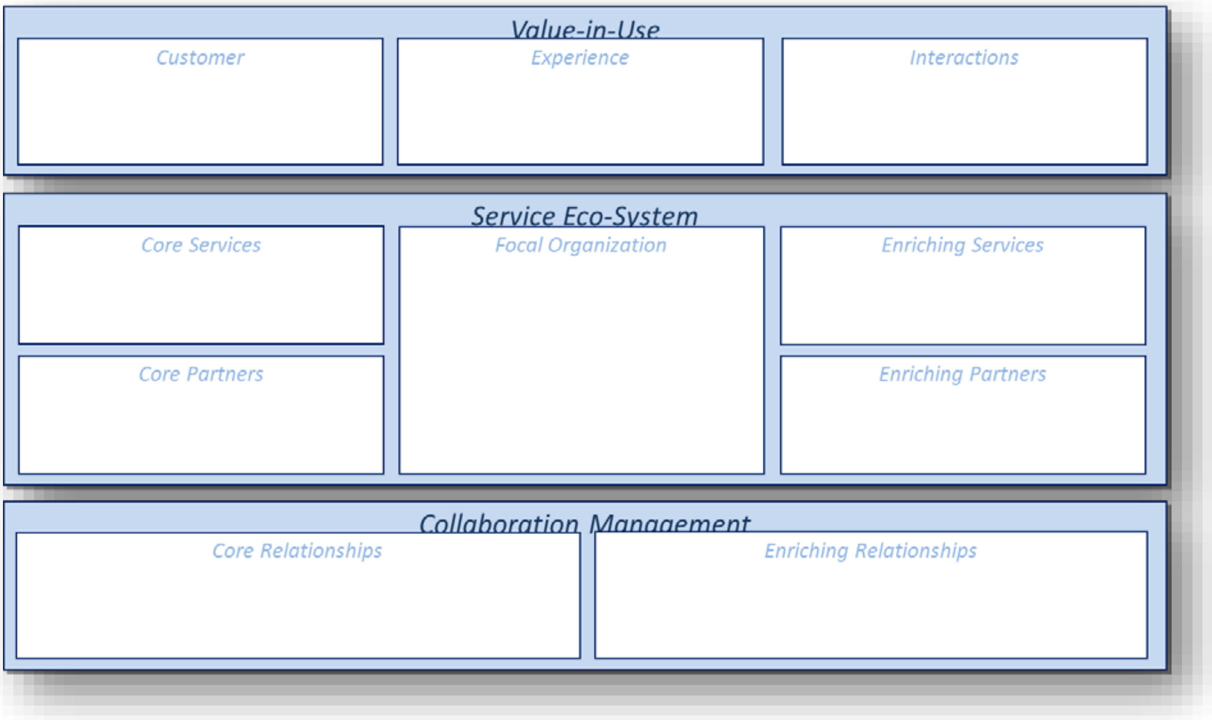


Figure 7 - Example of pragmatic strategy canvas

4.3.2 Customer identification

In the strategy canvas the value-in-use provided by the focal organization in that canvas is on an abstract level. The design of concrete business models is the process to arrive at a concrete value-in-use.
Thinking from a value-in-use-centric perspective, this means explicitly scoping the abstract value-in-use associated with the business strategy towards a specific customer profile [2].

Different dimensions can be used for performing this scoping, related to the customer groups of the focal organization.

Abstract	Group	Concrete value in use	Label
The abstract value-in-use as defined in the strategy canvas	Customer segment 1	Concrete value in use, bases on abstract and customer segmentation	ID
	Customer segment N	Concrete value in use, bases on abstract and customer segmentation	ID

Figure 8 - Example of customer identification table

In section 6 the customer identification for the Core Platform operator and Client Platform operator are provided.

4.3.3 Business model level

BASE/X provides a service-dominant business model radar. This radar is the central tool in the development of service-dominant business models. It is a tool to specify an operationalized value constellation.

The radar consists out of three concentric rings and a core.

1. The core of the radar presents the co-created value-in-use, which is composed of service-based value propositions of the actors participating in a business model.
2. These value-propositions are depicted in the inner concentric ring.
3. The middle concentric ring depicts the coproduction activities of the actors, which represent the service management.
4. The outer concentric ring represents the cost and benefits of the actors.

The actors involved in a business model are represented by radial regions of the radar model ("slice of the pie"). There is no limit in the number of actors. This implies that the model is designed for the representation of multi-sided business models. In a service-dominant business model, the customer is one of the actors.

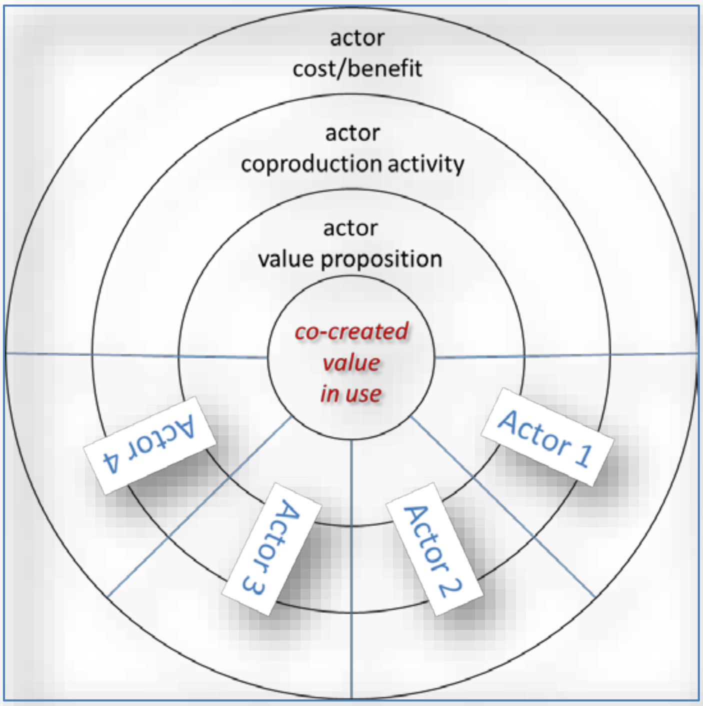


Figure 9 - Service dominant business model radar (source BASE/X)

In section 8 business models radars for the core platform operator are provided. In section 9 the radars are provided for the scenarios in the proto-type as delivered in the GET project.

5 Strategy level

For the exploitation model of GET Service platform, multiple strategy canvasses based upon the BASE/X framework, as described in section 4.3.1, have been created for the roles in the GET Service project.

As mentioned in section 3 of this deliverable, every business actor (for instance LSP and TSP), provider of a platform and/or device in the architecture needs to define its own strategy. Every provider has its own identity, and there for it is not possible to create one overall strategy canvas for the project.

In this deliverable for seven roles a strategy canvas has been developed. These roles are:

1. Core platform provider;
2. Event engine provider;
3. Client platform provider;
4. Event engine operator;
5. Client device provider;
6. Technology provider and Extended GET platform provider;
7. Infrastructure platform provider;

The reasons to develop the strategies for these roles are:

- Covering all layers in the architecture of the GET Service project (the stable part, the agile part and the diverse part);
- Covering all partners in the project, including partners which provide technology and / or knowledge and are not part of the enactment of transportation processes. These partners are now included in the strategies of the other partners, but foreseen is that in the future these partners can develop into cloud service providers;
- Covering a strategy for a client of transport, as clients are part of a service-dominant business model;
- Covering the two roles of Port Community System providers: core platform provider and infra platform provider;

5.1 Strategy canvas Core platform operator

For this deliverable the strategy canvas for a GET Core platform operator has been developed. In the GET Service project this role is performed by Portbase.

As mentioned in chapter 3 of this deliverable, the role of GET Core platform operator could and should be fulfilled by all European PCS operators. Therefore, this strategy canvas is applicable to all existing European PCS operators.

The PCS operators are united as partners in IPCSA. Within this partnership, the PCS operators discuss the function of, and are jointly promoting the Port Community Systems.

All PCS's provide services for exchanging information (planning, operations, events), and the strategies of these organisations are to facilitate seamless port-related transportation. In the specific case of project partner Portbase, its strategic goal for the period 2015 – 2019 is to realise real-time and integral information exchange, for the Dutch ports and their hinterland supply chains.

The provision of business services is combined with core services as authentication, authorisation, registration and logging. These last category of services, the core services, are of relevance for the role of the GET Core platform. For this exploitation model, within the GET Service context, the role of the PCS operators is distributed over two roles:

1. Core platform operator for the provisioning of the core platform services and
2. Infrastructure platform provider for the provisioning of data services and providing events needed for the scope of GET Service.

The eco-system of PCS operators can be seen as the stable engine(s) of the GET Service platform and the EWSP. The eco-system provides, amongst others, services for connectivity (interface definitions), trust (authorization and authentication) and logging. This foundation for information exchange is stable and accessible for all authorised actors involved in transportation and/or in IT service offering. Due to this stability, other parts in the architecture can be more flexible and agile, which implies that partnerships and business models can change for the roles providing platforms and devices in those parts. This will lead to the needed flexibility and agility in the supply chains for establishing green transport (able to switch to other modes of transport than only truck).

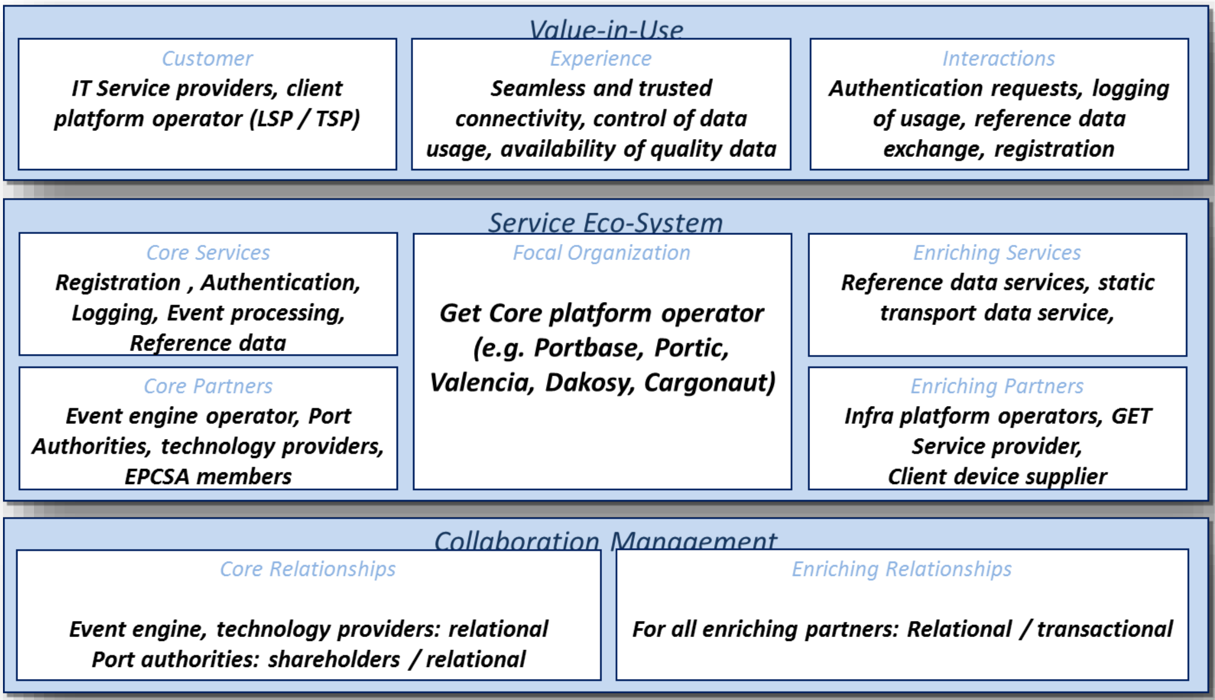


Figure 10 - Strategy canvas for the GET Core platform operator

The elements in the strategy canvas of the core platform operator can be informally and briefly described as follows:

- Customer: the customers of the core platform operator. In context of the GET Service project these customers will be IT service providers and client platform operators;
  - IT Service Providers can use the services for establishing trusted connectivity and authentication and authorisation of the use of their systems and/data. IT Service providers can publish and/or retrieve reference data from the information store;
  - Client platform operators can use the services for authorizing the use of (reference) data by others. In some specific cases the client platform operator has developed its own platform, and functions in the role of IT Service Provider. This implies that it can use the same services as mentioned;
- Experience: The experience the core platform operator provides to the customers. The core platform facilitates seamless and trusted connectivity with partners in the supply chain. It provides

a full control over data usage by others and guarantees a high-quality of information exchanging by providing standardised reference data. Together with the other GET Service partners the core platform provider provides the seamless real-time transportation experience, for which the core platform operator functions on the background as a trusted third party. This partner-based value-in-use will be expressed in the value-radar in chapter 7.

- Interactions: The core platform operator facilitates the interactions concerning:
    - The registering of service providers, the services, customer organisations and users;
    - The requests for authentication – are users allowed to enter specific systems and / or data?
    - The exchange of static (reference) data, e.g. planned routes, location data, identification numbers;
    - The logging of interactions for tracking, evaluation and/or financial purposes;
- The core services are registration of systems/ users, authentication of users, logging of interactions, event processing and providing reference data
    - For the GET Service project the provision of the event processing service is done by project partner HPI. Within the project it has been proven via proto-typing that this functions very well. When the GET Service will be implemented and offered to the market, this distribution could be continued.
- Enriching services: services provided to the core platform operator which enrich its core services. For the core platform operator these services will mainly be reference data provisioning services by third parties. For instance location codes, infrastructure codes, identification numbers as SCAC, ENI number and dangerous goods classifications;
- Core partners: the core partners of the core platform operator that help creating and offering the core services:
    - Event engine provider: providing the components for event handling;
    - Technology providers: providing the tooling and sub-systems for the core services (e.g. Service Bus provider);
    - Port authorities: in most cases the port authorities are the shareholders of the Port Community Providers. In the specific case of project partner Portbase, these are the Port of Rotterdam and the Port of Amsterdam (75% - 25%). The financial coverage of the platform infrastructure is done by these shareholders.
    - IPCSA member: with the European-wide Service Platform in mind, a network of core platforms is needed, to handle the large geographic scope, as well as to be able to deal with the differences of law and regulation and the differences of interests and competitive positions of the business actors. To establish this network, providing trusted agility and flexibility, the IPCSA members must be core partners;
- Enriching partners: the partners providing the enriching services.
- Relations of the core platform operator: what kind of relations does the core platform operator maintain with its partners?
    - The relations of the core platform operator with its core partners are relational. A special relationship is the relation with the shareholders.
    - The relation with its enriching partners can be relational (e.g. reference data provision in kind) and transactional (e.g. the purchase of reference data and/or events).

5.2 Strategy canvas Event engine provider

For this deliverable the strategy canvas for an Event engine provider has been developed. In the GET Service project this role is performed by HPI.

The experience (value-in-use) the event engine provider offers is agility in event stream processing. A customer (LSP and TSP) can subscribe to and switch between relevant (real-time) events, concerning the transportation of cargo. The core services of the event engine provider are the identification and prediction of deviations in the supply chains of the customer. The enriching services are services from event providers as weather agencies, social media platforms and Port Community System providers.

To establish the services, the event engine provider needs core partners:

- The TSP and LSP for providing information / events. This data is used to make the service provisioning 'smarter' as it learns and detects patterns, which are used for prediction purposes;
- The GET Core platform operator(s); these operators provide the core components for, amongst others, authenticating, static reference data and connectivity;
- Logistics Suite; the event engine could become part of larger logistics suites offered by other IT service providers;
- The Client device providers for creating and exchanging events;

The above-mentioned elements are briefly given in the strategy canvas in figure 10.

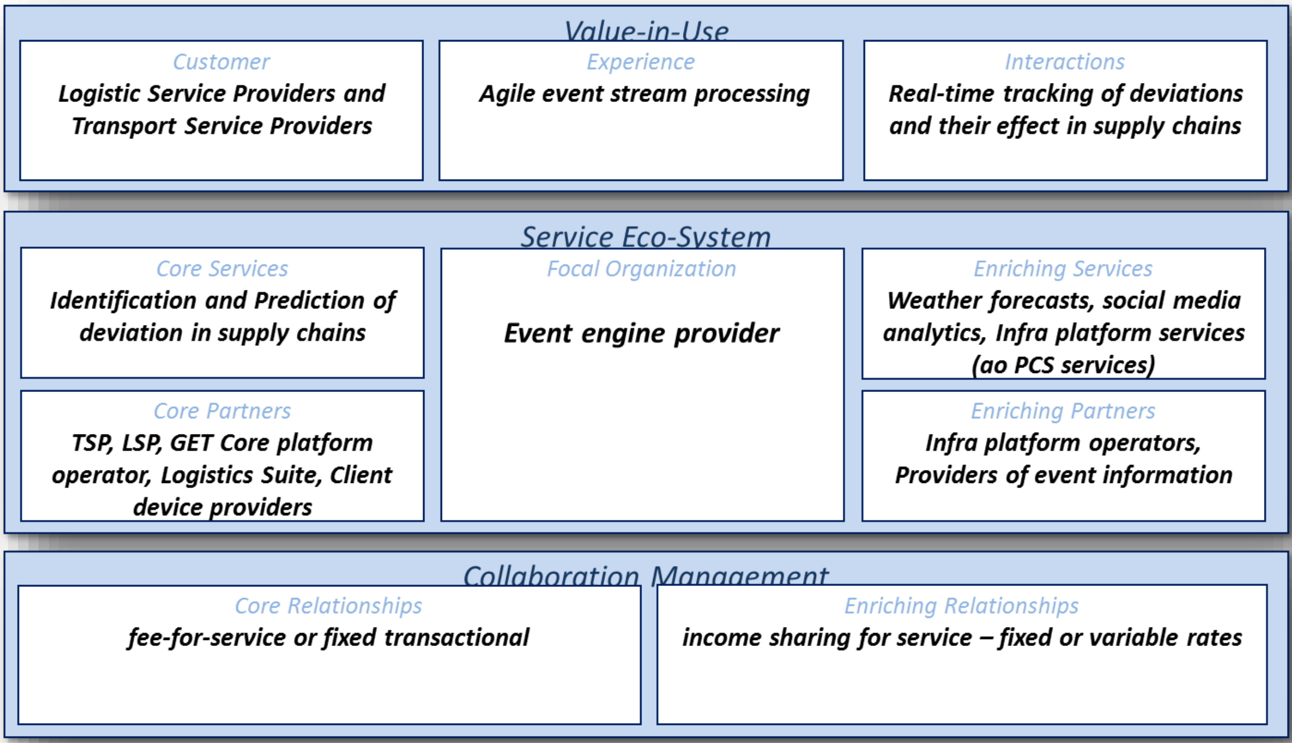


Figure 11 – Strategy canvas for the Event engine provider

5.3 Strategy canvas Client platform operator

For this deliverable the strategy canvas for a Client platform operator has been developed. In the GET Service project this role is performed by Jan de Rijk, a multi-modal LSP. In this canvas the project partners Transver, IBM and PTV are involved as enriching partners (knowledge and technology providers).

The focal organisation in this canvas is a multi-modal Logistic Service Provider. This specific role fits the scope and aim of the GET Service project, as it desires to establish green transportation. A multi-modal LSP is able to provide and/or charter other means of transport then only trucking. It provides transport solutions fitting to the demand for transportation, meeting the requirements given by the customer, set by law and regulations and/or connected to the type of cargo.

Customers of the LSP are:

- Providers of freight – Overseas production (outside EU borders) companies, without own assets and having the goods transported via European main ports (air, sea);
- Shippers (exporters and importers) – these organisations work for the providers of freight and are responsible for exporting and importing the goods;
- Retailers – These organisations buy and sell products. For the retailers the last mile transportation is of extreme relevance (timely delivery in warehouses and/or stores);
- Logistics Agents – These organisations are the traders between the Providers of freight and the LSP. In the specific case of Jan de Rijk this is road transport only;
- Industry – The industry (EU based) has a need for transportation between ware-houses and cross-docks. This transportation does not enter the main ports, but is continental;

The above-mentioned elements are briefly given in the strategy canvas in figure 11.

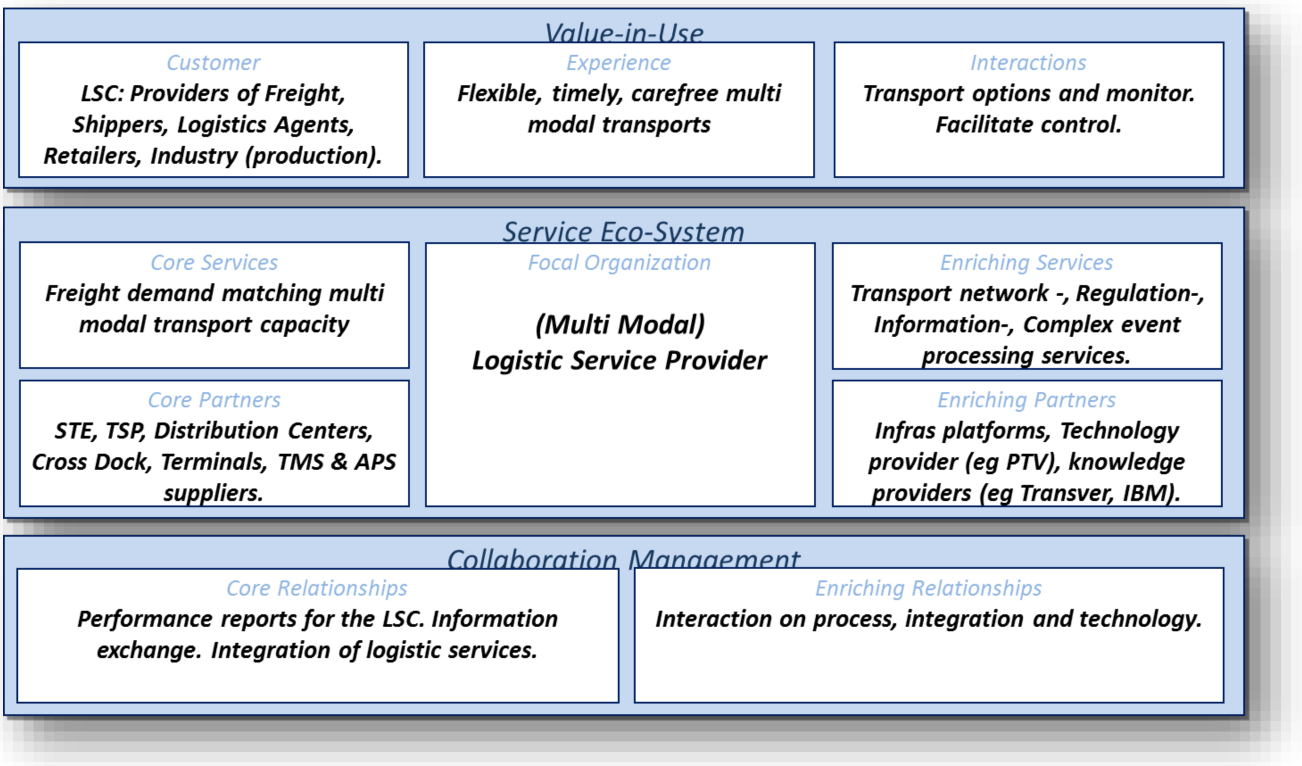


Figure 12 - Strategy canvas for the Client platform operator

5.4 Strategy canvas Client Device provider

For this deliverable the strategy canvas for a Client Device provider has been developed. In the GET Service project this role is performed by EXUS. This project partner created the software, which runs on mobile devices (hardware). For this strategy canvas, the Client Device provider therefore is as service provider, without providing the hardware.

As software is an asset, and not a service, it does not fit well to the service-dominant approach. For uniformity reasons the strategy canvas is created, as for all other partners.

The experience the client device provider offers to its customers (TSP, LSP and clients of transport) is being able to establish easy communication between clients and providers of transport on capacity and the actual status of transport. The services it provided are flexible event generation, for communicating on the status of transportation, and flexible command communication, for sending orders for transportation.

The core partners the client device operator needs for creating the services are the client platform operators and the event engine providers, for connectivity and exchanging orders and events. Hardware providers are core partners as well, for provisioning the mobile devices.
Enriching partners are providers of application stores, for distribution of the service(s) provided by the client device provider.

The above-mentioned elements are briefly given in the strategy canvas in figure 12.

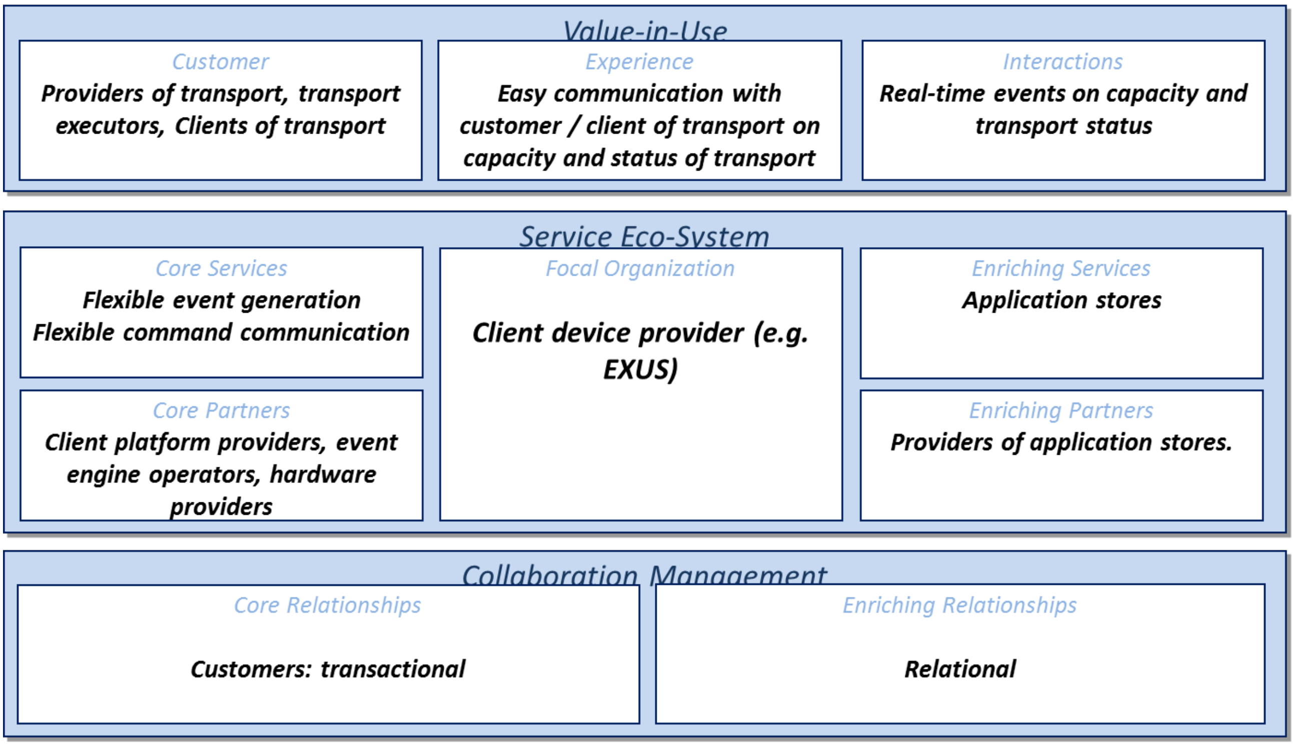


Figure 13 – Strategy canvas for the Client Device provider

5.5 Strategy canvas Technology provider / extended GET platform operator

As mentioned in section 3 of this deliverable, for the role of Technology provider two types can be distinguished. Both types are present in the GET Service project, based on their role in this project:

- Providers of build-time solutions (IBM);
- Providers of cloud solutions (PTV);

Within the strategy canvas of the Client Platform provider, the first type of Technology providers are mentioned as enriching partners. These providers create solutions tailor-made to the needs of the end-users, which install them within their own IT eco-system. The value-in-use, as well as the provided services, depends on the demands and needs of its customers. These customers are, within the GET Service context, the platform and device providers.

For the cloud service providers, within the same context, the customers are also the LSP and TSP. The value-in-use is flexibility in using services, as these services need not to be installed within the IT eco-system of the customer. The relationship therefore is transactional to its customers, where for the build-time solution provider licences can be in place as well. This role, in the context of the GET project, is called the extended GET platform operator;

The above-mentioned elements are briefly given in the strategy canvas in figure 13 and 14.

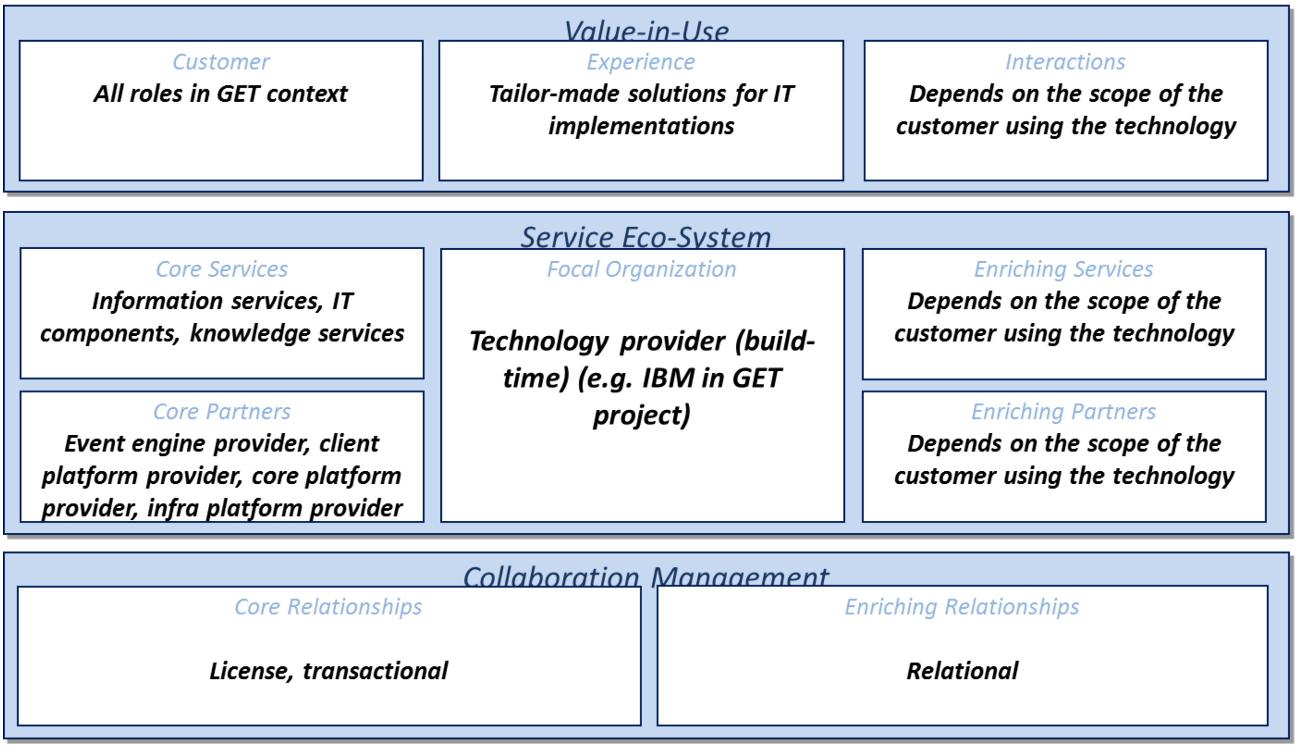


Figure 14 – strategy canvas for the Technology provider (build-time solutions)

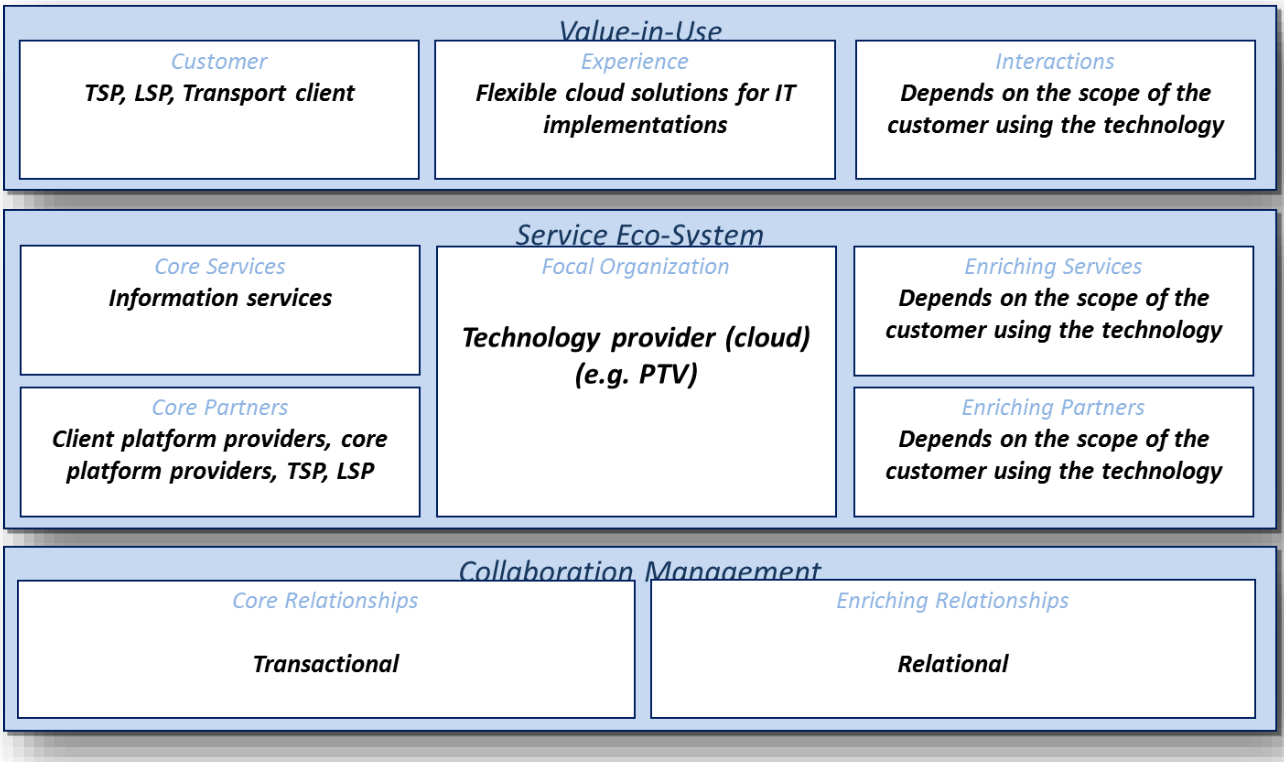


Figure 15 – strategy canvas for the Technology provider (cloud solutions) / Extended GET platform operator

5.6 Strategy canvas Infrastructure platform provider

For the Infrastructure Platform Provider, a strategy canvas has been created. In the GET Service project this role is performed by project partner Portbase and Via Donau (partner of project partner WU).

As described in section 5.1, Port Community System operators partly fulfil the role of infrastructure platform provider. These systems enable public and private organisations to exchange information on planning and operations, for instance on expected and actual vessel arrivals, discharge lists and – confirmations, inspection statuses and planned modes of hinterland transport. By doing so, these systems hold an integral view on the status of port infrastructures and are able to generate events. For instance the update of the port arrival time of a sea vessel, could imply that planned hinterland transport is no longer feasible and alternatives need to be found.

Other relevant infrastructure platform providers are for instance Ministries of Transport and governmental agencies, as these organisations collect and maintain relevant information on the planned (for instance maintenance on roads, opening times of bridges and locks) and current status of infrastructures (traffic jams, water levels of inland waterways, temporarily road network restrictions for heavy transports, deviations on road or water infrastructures due to weather conditions).

The value-in-use the infrastructure platform provider provides to its customers is a reliable insight in planned and current status of (port) infrastructures. The customers are both providers and users of transport, terminal operators (port infrastructure) and authorities.

The above-mentioned elements are described in the strategy canvas in figure 15.

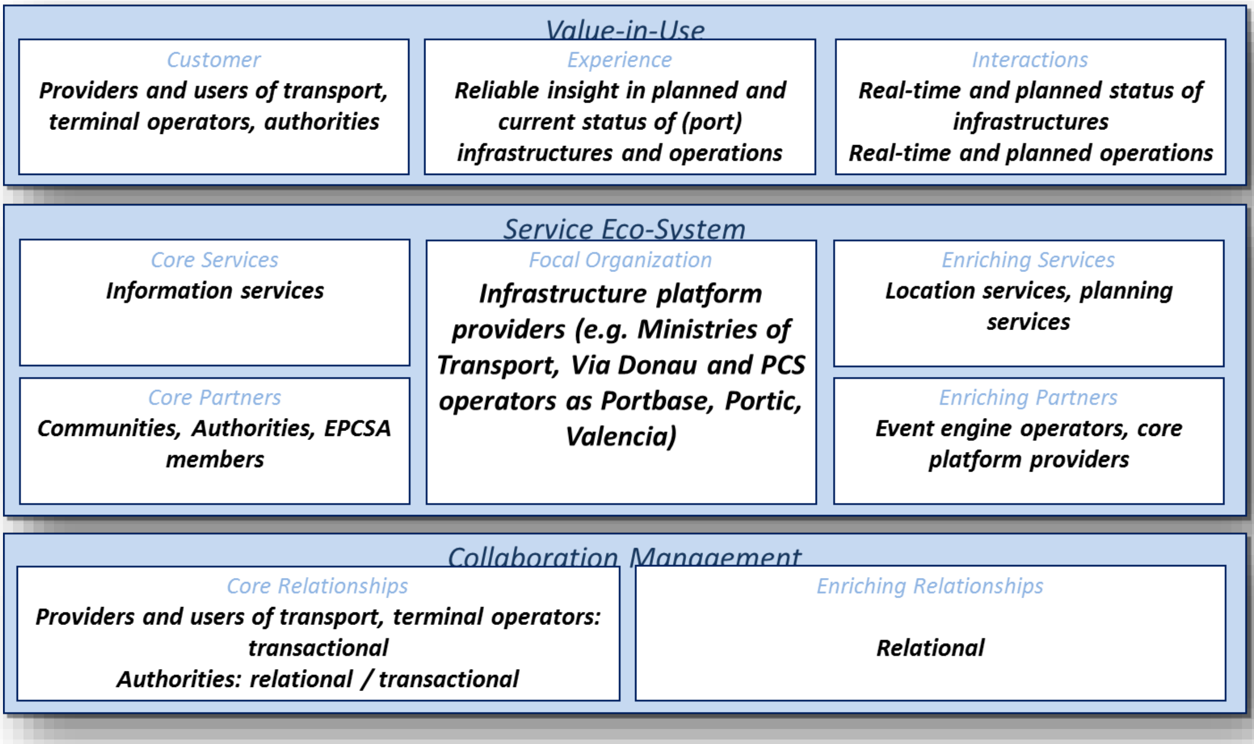


Figure 16 – strategy canvas for the Infrastructure platform provider

6 Customer identification

In this section for two roles the customer identification has been performed. The roles are:

- Core Platform Operator - this role is the “orchestrator” of the GET Service platform, and integrates all partners on operational level;
- Client Platform Operator – this role represents a business role.

When operatizing the GET Service platform, or any other network-centric and service-dominant solutions, all partners involved create own customer identifications, and define a concrete value-in-use they offer to them.

6.1 Customer identification for Core Platform Operator

Based upon the strategy canvas in chapter 5.1 multiple business model types for the Core Platform Operator were created. For creating the business models types, the abstract value-in-use as defined in the strategy canvas was associated with specific customer profiles, resulting in concrete value-in-use for these customers.

For the Core Platform Operator (within the GET Service context), multiple types of customers were described in the strategy canvas.

- IT Service providers - is an organisation that provides IT services in the transport and logistics domain, thereby enabling, amongst others, information exchange. The concrete value in use is for the IT Service provider to be able to operate as trusted partner with a broad and flexible connectivity, offering a full control over data usage and ownership and quality of that data;
- Single transport executor - is a single driver with one truck handling one leg (shipment from A to B). The concrete value-in-use the core platform operator provides is that the transport executor has a trusted connectivity for sharing capacity and receiving orders from a LSP;
- Transport service provider - is an asset based transport company with multiple drivers and trucks handling multiple legs and shipments. The concrete value-in-use the core platform operator provides is that the TSP has a trusted connectivity for sharing capacity (multi-legged transport) and receiving orders from a LSP;
- Logistics service provider - is a non-asset based company which coordinates logistics activities. The LSP is responsible for coordinating the transportation and thus for knowing of delays (transportation and handling at DC’s and terminals). It cooperates with TSP’s based on the demand from LSC’s. The concrete value-in-use the core platform operator provides is that the LSP has a trusted connectivity for managing synchro-modal and real-time transport;
- Logistics service client - is an entity which has a certain freight demand and is in need of transport capacity. The concrete value-in-use the core platform operator provides is that the client has a trusted connectivity for discovering the best partners for transportation and can establish a real-time outsourced transport management, thereby being able to meet requirements for green transportation;

Abstract	Group	Concrete value in use	Label
Seamless and trusted connectivity, control of data usage, quality of reference data	IT service provider	Operating as trusted partner with broad and flexible connectivity, providing full data control and quality	ITS
	Single transport executor	Trusted connectivity for authorised sharing single-modal one-leg capacity, receiving orders	STE
	Transport Service provider	Trusted connectivity for authorised sharing single-modal multi-leg capacity, receiving orders	TSP
	Logistics Service provider	Trusted connectivity for authorised integrated synchro-modal realtime transport management	LSP
	Logistics Service Client	Trusted connectivity for authorised green realtime out-sourced transport management	LSC

Figure 17 - Customer identification core platform operator

The concrete value-in-use is defined per customer-type. Starting at the lowest value-in-use and scaling upwards in the provision of value. The more value provided, the more partners are needed to establish this value-in-use. In section 5.1 the customers and the services provided by the core platform operator are described.

6.2 Customer identification for client platform

Based upon the strategy canvas in section 5.3 multiple business model types for the Client Platform Operator were created. For creating the business models types, the abstract value-in-use as defined in the strategy canvas was associated with specific customer profiles, resulting in concrete value-in-use for these customers.

In the project this role is performed by Jan de Rijk. The customer types of Jan de Rijk are:

- Providers of freight – The concrete value-in-use Jan de Rijk provides is an optimisation of transport starting at the main ports and ending at the location of the end-users. Especially for air-freight Jan de Rijk is handling inter-port transports;
- Shippers (exporters and importers) – The concrete value-in-use Jan de Rijk provides is optimising the transportation to and from the main ports;
- Retailers – Jan de Rijk provides the timely delivery in the last mile to the retailers (warehouse, store);
- Logistics Agents – The concrete value-in-use is optimisation of the transport for the logistics agents.
- Industry – Jan de Rijk offers transport optimisation for the intercompany movements;

Abstract	Group	Concrete value in use	Label
Flexible, timeliness, carefree multi modal transports	Providers of freight	Transport optimisation starting at mainport to end-users	POF
	Shippers	Transport optimisation for import and export from and to mainports	SHI
	Retailers	Timeliness delivery in last-mile distribution	RET
	Logistics Agents	Road transport optimisation	LOA
	Industry	Transport optimisation of intercompany movements (eg warehouse - warehouse)	IND

Figure 18 – Customer identification Client platform operator

7 Business model level

A business model radar describes the partnership between multiple actors, which are involved in the co-creation of the value-in-use. A radar describes a ‘level playing field’ for all actors involved in the service provisioning, as all actors have their own costs and benefits (mutual ethical benefit). A radar has a central actor (orchestrator), which integrates all partners on operational level. This central actor however, is not leading and owning the business model. This implies that the business model is owned by the partnership, as all partners have a stake in the model. Of importance is the fact that the customer is part of the partnership.

The concrete value-in-use, defined in the customer identification, is centred in the business model radars.

Based upon the customer identification for the role of Core Platform Provider, two service dominant business model radars for two business model types were created. In the business models all partners are integrated for which strategy canvasses were provided in section 5 of this deliverable. This integration is done for the establishment of agile business networks, which implies that the business models are specifically not for one actor only.

As mentioned in section 6, the more value provided, the more partners are needed. This is expressed in the two radars, as the first radar describes a “low” and the second radar a “high” value-in-use.

The business models provided in this section can be further quantified at a later stage. The financial ‘numbers game’ is not included in this exploitation model.

In section 4.3.3 the working of the business model radar is explained.

7.1.1 Business model radar Single Transport Executor

The value-in-use in this business model is centered round the small-sized TSP, owning only one type of asset, and there for one transport leg only (for instance trucking from warehouse to inland terminal). The central value-in-use is being able to share capacity and transport demand, via trusted connectivity. As this is a small service, relative little partners (five) are involved in this business model, in order to provide the value-in-use. The radar is modelled conform the BASE/X framework:

- In the outer ring, per partner the costs (in red) and benefits (in green) are provided;
- In the second ring the activity per partner is provided. This indicates what each partner needs to undertake or to provide, in order to provide the value;
- In the third ring, the value proposition per partner is given. It indicates the contribution per partner to the central value-in-use, which is provided in the middle of the radar;

The model is presented in the following figure.

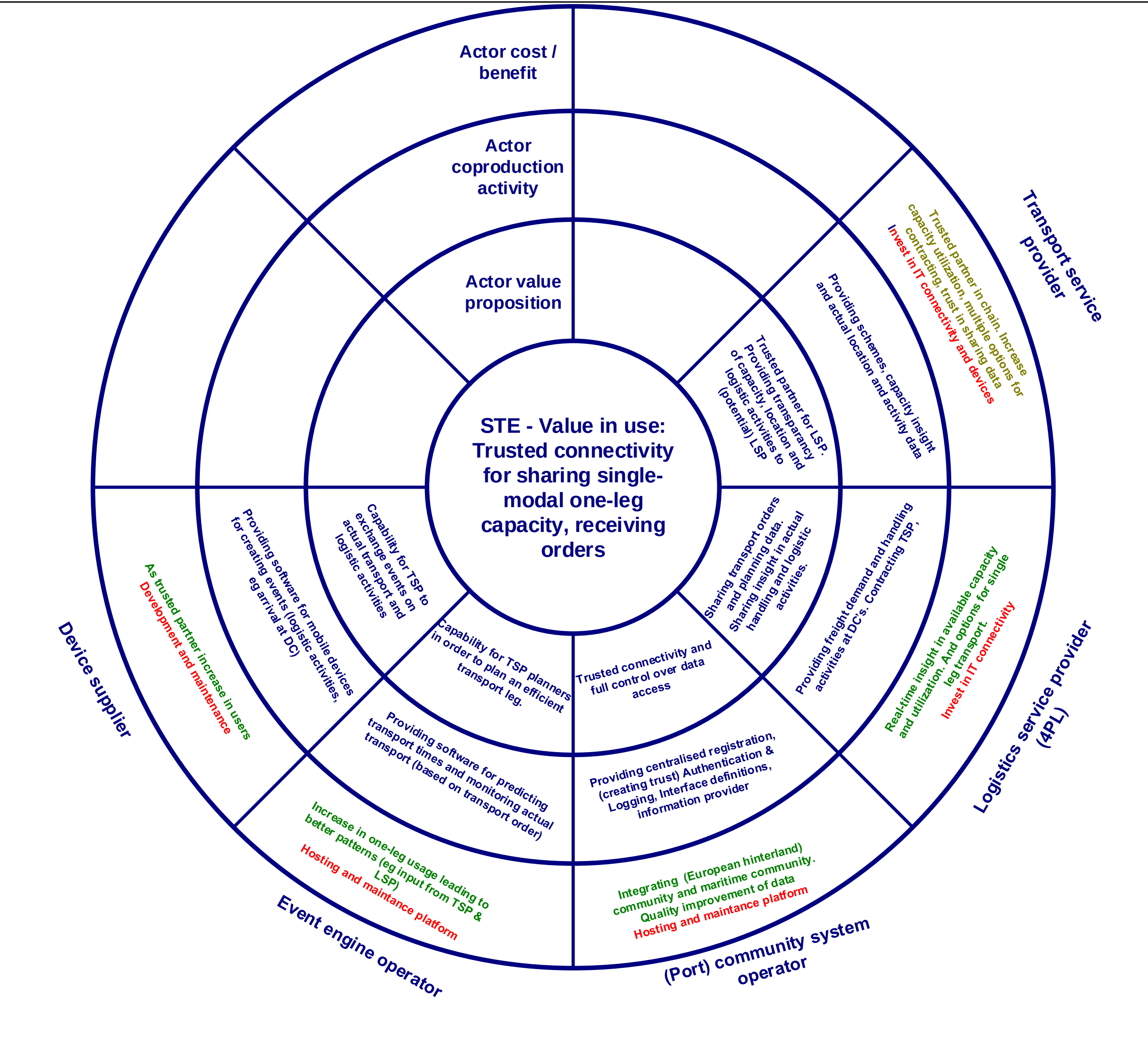


Figure 19 - Business model radar Single Transport Executor

When mapping the project partners of the GET consortium to this model, the following partners are involved in this business model:

- Transport Service Provider – Jan de Rijk (asset and capacity provider)
- Technology provider – PTV, WU and Transver as partner of the TSP for scheduling options
- Logistic Service Provider – Jan de Rijk (4C / 4PL)
- Core platform provider – distributed over Portbase (core components) and HPI (event components
- Technology provider – IBM as partner of the Event Engine provider
- Device supplier - EXUS

7.1.2 Business model radar Logistics Service Client

The value-in-use in this business model is centered round the Logistics Service Client, in need for trusted outsourced management of green transport. The client is in need to discover potential partners which are able to manage and execute synchromodal (green) transportation. The central value-in-use is focused on that specific need. As this is a large service, many partners (eight in model, when implemented this number will increase as, for instance, multiple TSP's and Infrastructure Platform operators will participate) are involved in this business model, in order to provide the value-in-use.

The model is presented in the following figure.

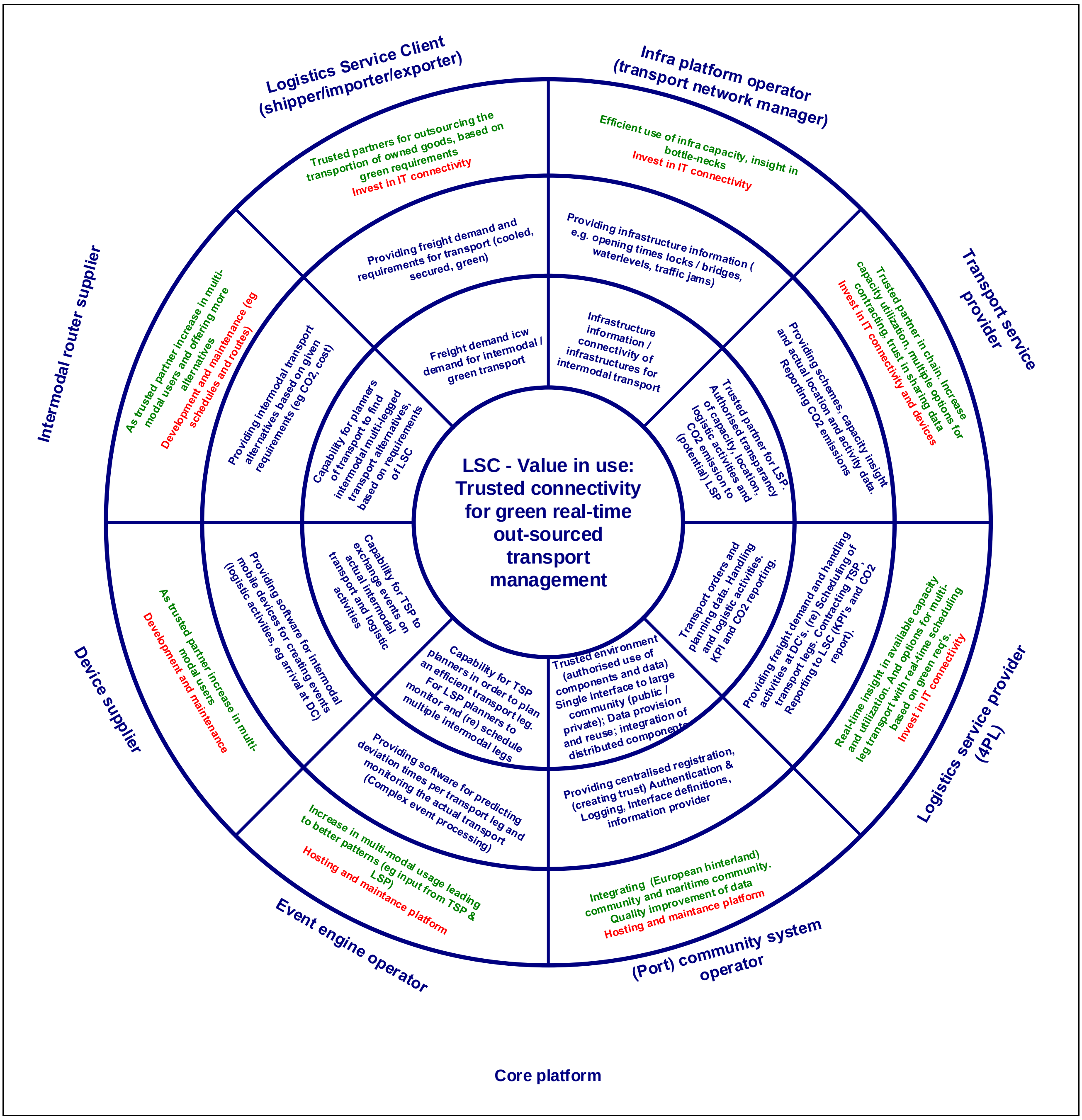


Figure 20 - Business model radar Logistics Service Client

When mapping the project partners of the GET consortium to this model, the following partners are involved in this business model (clockwise):

- Infrastructure platform provider – Via Donau, Portbase
- Transport Service Provider – Jan de Rijk (asset and capacity provider)
- Logistic Service Provider – Jan de Rijk (3PL)
- Core platform provider – distributed over Portbase (core components) and HPI (event components
- Technology providers – IBM as partner of the Event Engine provider, Transver and WU as partners for the intermodal router supplier
- Client Device supplier – EXUS
- Intermodal router supplier – PTV (as cloud service provider)
- Logistics Service client – Jan de Rijk (4PL)

8 Mapping of business model to demonstrator cases

In Deliverable 2.4.1 [9] the demonstration scenarios for the prototype (first cycle) of the GET Service project are described. The scenarios are:

- Multi-modal planning scenario;
- Freight shift scenario;
- Inland waterway scenario

For each of these demonstrator scenarios a business model radar has been created to show that the scenarios are in fact realistic examples of real-world business application of GET deliverables. The business modelling has been done for the involved project partners. Role-allocation will be different in real-world exploitation, for instance the University partners will not actively be involved in the service offering.

8.1 Multi-modal planning scenario

The following roles and project partners are involved in this scenario:

- Core platform operator – performed by project partner Portbase
- Client device operator – performed by project partner EXUS
- Extended GET Platform operator – performed by project partner TU/Eindhoven
- Event engine operator – performed by project partner HPI
- Client platform operator – performed by project partner TU/Eindhoven
- LSP / TSP – performed by project partner Jan de Rijk
- Technology Provider – PTV (planning), IBM (process snippets), Transver (CO2 calculations)
- Infrastructure platform operator – performed by project partner Portbase

For all these roles strategy canvasses are provided in section 5, where the Technology Provider (cloud services) and the Extended GET platform operator were combined.

The concrete value-in-use of this demonstration scenario is trusted connectivity for integrated multi-modal real-time management of transport.

In the business model for this demonstrator scenario, PTV has been included as a partner for the TU/Eindhoven. This can be divided, as PTV functions as a cloud service provider, and therefore as a partner itself in the business model. This division has been done for the next demonstrator case, the Freight shift scenario, in section 8.2.

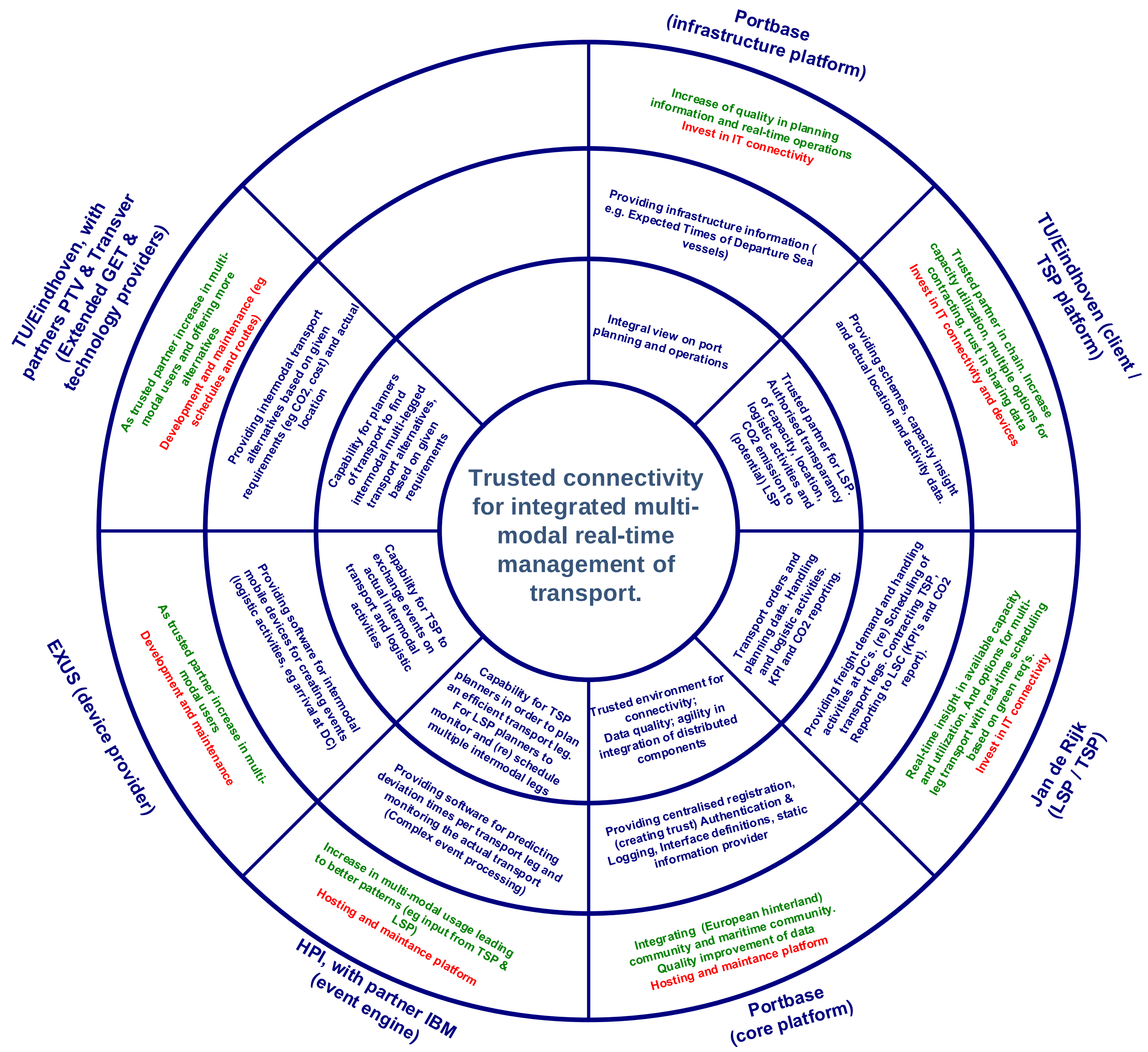


Figure 21 - Business model radar demonstrator multi-modal planning scenario

8.2 Freight shift scenario

The following roles and project partners are involved in this scenario:

- Client device operator – performed by project partner EXUS
- Extended GET Platform operator – performed by project partner TU/Eindhoven
- Event engine operator – performed by project partner HPI
- Client platform operator – performed by project partner TU/Eindhoven
- LSP – performed by project partner Jan de Rijk
- Technology Provider (build-time) – IBM (process snippets), WU (planning algorithms)
- Technology Provider (cloud) – PTV (planning)

The concrete value-in-use of this demonstration scenario is trusted connectivity for real-time management of capacity.

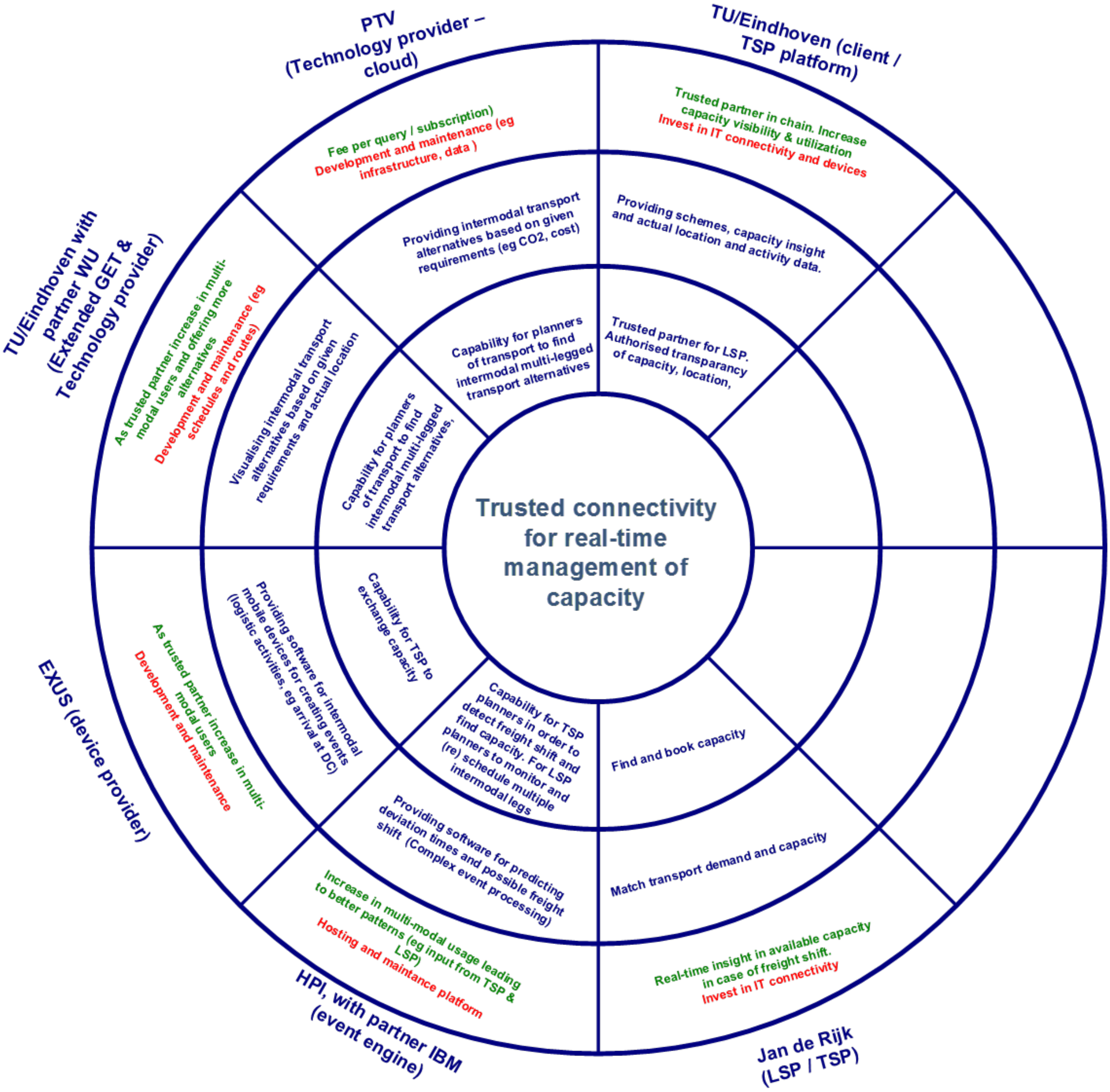


Figure 22 - Business model radar demonstrator freight shift scenario

8.3 Inland waterway scenario

The following roles and project partners are involved in this scenario:

- Client device operator – performed by project partner EXUS
- Extended GET Platform operator – performed by project partner TU/Eindhoven
- Event engine operator – performed by project partner HPI
- Client platform operator – performed by project partner TU/Eindhoven

- LSP – performed by project partner Jan de Rijk
- Technology Provider (build-time) – IBM (process snippets), WU (planning algorithms)
- Technology Provider (cloud) – PTV (planning)
- Infrastructure Platform operator – Via Donau

The concrete value-in-use of this business model is establishing a robust planning for inland shipping.

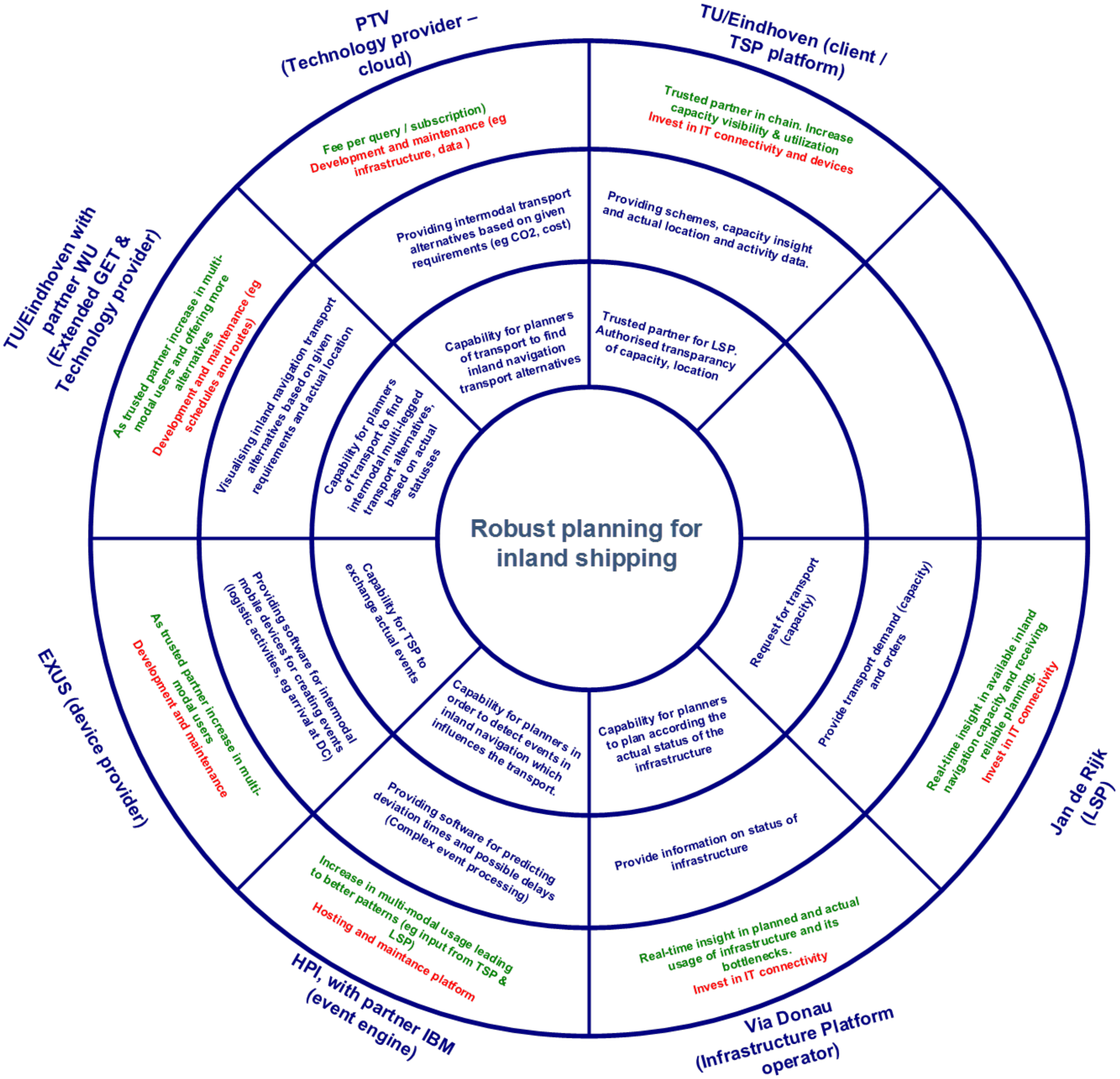


Figure 23 - Business model radar demonstrator inland waterway scenario

9 Partner and overall exploitation plans

This section provides an overview of the exploitation plan of each industrial GET Service project partner, for exploiting parts of the intellectual property, tools and algorithms that are being developed as part of the project. Four of the exploitation plans were presented at the GET Service final event. Links to these presentations are provided in Chapter 13.

9.1 Portbase

The components Portbase provided to the GET Service project are the information store, the service registry, the community passport and the log manager. These components are situated in the core platform, which functions as an integration layer, and are necessary for the coupling of all other components in the GET environment. The components provide high-quality (reference) data, authentication and thereby trust, and logging of actions performed by connected users and systems (audit trail). Through these core services, customers of Portbase (i.e. transportation companies, technology providers and other stakeholders in the logistics value chain) will be able to communicate with each other in the spirit of the GET Service platform.

The Port Community System of Portbase shields more than 40 different services, which provide actors in port logistics the capabilities to share data. The strategic plan for the upcoming years is that Portbase aims at connecting more chain-wide real-time data and events to its infrastructure. In order to do so, Portbase needs to take up a different role. The GET Service project, and more specific the business modelling, has supported Portbase in identifying more explicitly its role as an integrator, next to the role of service provider. Integration services are needed in order to establish connectivity with other system providers and have them being able to develop own services connected to the infrastructure of Portbase. Doing so, the needed integral view on port logistics on administrative level will be broadened by combining it with real-time operational data.

Portbase already has integration components in place, as they are needed to operate the functional services. However, as learned via the GET Service project, these integration components need to be “servitized”. Having these components available to the market as separate services, flexibility and agility will be provided for market actors and their system and software providers.

Portbase is currently in the process of implementing the core platform services that are described in D2.3 into their software platform. Further core platform services will be developed in D2.3 in Y3 of the project, which will also be incorporated into the Portbase software platform. The activities towards exploitation of the results are:

- Establishing the business model for the integration services. This will start in the third quarter of 2015;
- Creating business cases with actual customers;
    - At this moment Portbase is defining a proof of concept with a large terminal operator and its software supplier in which the core components as realized in the GET Service project will be used;
    - Portbase is talking to the Dutch organization “Neutraal Logistiek Informatieplatform” (NLIP) to implement the community passport for the total transport sector (maritime and airfreight). Portbase is one of the foundation platforms in this NLIP set-up;
    - In addition to that, Portbase is discussing the GET Service platform with their European counterparts in the International Port Community System Association (IPCSA). Coupling the Portbase systems and those of other Port Community System providers will enable broader communication between transportation companies. The GET Service architecture can function as reference architecture in this context.

Other integration components, besides the GET core components, are foreseen. For instance:

- Conversion as a Service for translation of logistics messages;
- Security as a Service for setting-up secure connections between logistics partners;

As for the business model quantification, Portbase already calculated a base scenario for the revenue for data and integration services. This is included in the strategic plan for the period 2015 – 2019. It concerns a low-scaled implementation scenario of the integration services.

Data & integration	2014	2015	2016	2017	2018	2019
Data & Integration	€ 0	€ 0	€ 45	€ 90	€ 125	€ 160
Total revenue	**€ 0**	**€ 0**	**€ 45**	**€ 90**	**€ 125**	**€ 160**

Figure 24 - Portbase revenue for integration services

As for the cost components of the development, implementation and exploitation of the integration services, Portbase included these in the before-mentioned strategic plan.

	2014	2015	2016	2017	2018	2019
Basis infrastructure & service offering						
Strengthen existing capabilities	€ 0	€ 1.089	€ 1.120	€ 1.047	€ 1.036	€ 1.019
Exploitation & Development						
Strengthen existing capabilities	€ 0	€ 1.142	€ 1.347	€ 1.252	€ 1.251	€ 1.232
Development new capabilities	**€ 0**	**€ 340**	**€ 471**	**€ 507**	**€ 393**	**€ 410**

Figure 25 - Portbase costs for service development and exploitation

The costs mentioned in figure 25 concern the cost for the total service development and exploitation, thus including other services besides the integration services.

When providing these services, the value-in-use Portbase offers (in its role as integrator) to its customers, is the experience of trusted data exchange in the logistics domain.

As Portbase aims at connecting to real-time events, it is interested in partnering with the HPI start-up company (discussed below) for the event aggregation service. As Portbase also uses Tibco software, it needs to choose which component will be provided by which provider.

Portbase aims to provide the integration services to software suppliers and LSP’s with own IT departments.

Portbase created an overview of its market positioning, regarding its aim to innovate towards integral planning:

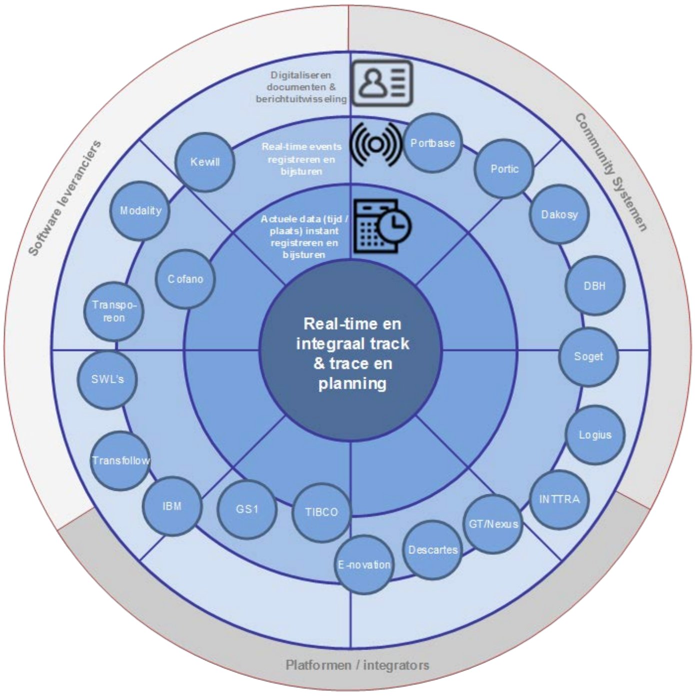


Figure 26 - Portbase market positioning

This overview is related to the different layers in data exchange in transport and logistics. The outer layer concerns the administrative and operational data. The second layer concerns the exchange of real-time events. The third layer concerns the ability to instantly react upon changes in the operational process. The inner circle is end-game in data maturity: being able to track and trace cargo through the entire supply chain (end-to-end) and predict the next steps.

9.2 HPI Start-up company

The component which HPI has provided during the project is the information aggregation engine, which correlates a continuous stream of incoming events of corporative systems. Through a unified interface, it distributes, correlates, and aggregates these events to high level events that are directly related to the state of one logistics process instance, required for service composition and enactment. Particular focus is put on providing constant quality of high level events, while events of corporative systems may be of varying quality, i.e., events may be missing or be out of order.

This result will be exploited further in the future. From HPI side;

- it will be used for further studies and implementations in educational context, e.g. student projects;
- it will be published as open software;

The event model taxonomy and the reference architecture for the information aggregation engine could be put forward for standardization.

HPI is currently exploring the possibility of creating a start-up company that exploits the core platform and in particular the information aggregation engine to develop value adding information provisioning services. Services that can be explored include information provisioning of publicly available information (on topics like traffic congestions, road works, water levels of inland waterways, blocked locks, and weather conditions) combined with location data of assets, but in such a way that custom warnings and alerts can be generated. Services also include predictive analytics services, such as services that forecast estimated times of arrivals and the effects of disruptions.

The activities which need to be performed by the start-up company are, amongst others:

- Performing a market analysis and creating a business model for the service offering on top of the information aggregation engine;
- Re-develop the component in software product state (rather than prototype state), define standardized interfaces and technical and operational integration of various event sources;
- Generalize event-based parts of the GET demo scenarios;
- Establishment of the organization;
- Hosting and maintenance of the component;

When offering the service to the market, the value-in-use for the customers will be:

- For transportation planners: 360° transportation monitoring via numerous kinds of internal and external data sources;
- For participants of a transportation execution (TSPs, trans-shipment centers, warehouses, etc.): Seamless real-time information exchange supporting the optimization of process lead times.

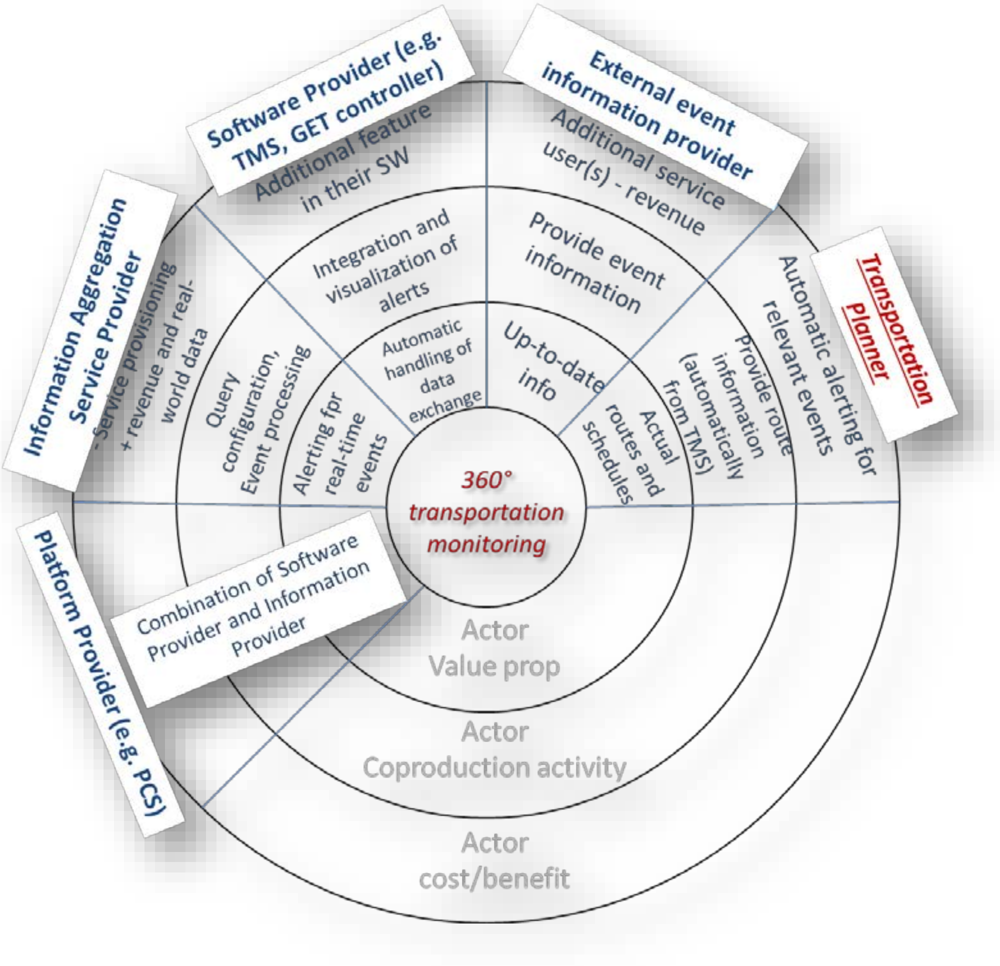


Figure 27 – HPI start-up: business model for transportation planners

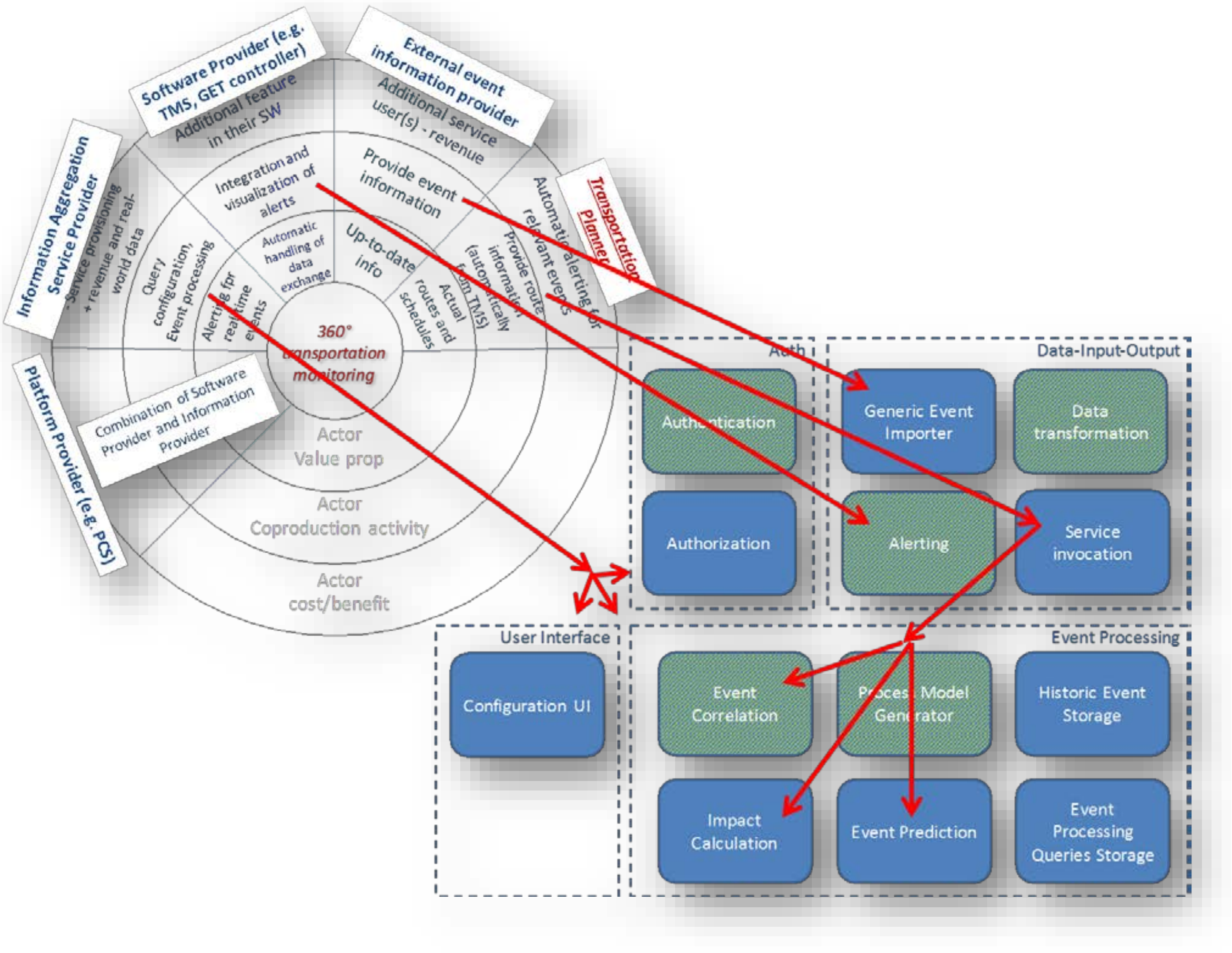


Figure 28 – HPI start-up: service compositions

The benefits gained from the GET project for the organization are:

- Technologically advanced software prototype jointly developed with industry partners;
- Established concept proven by several prototypes.

The cost structure when offering the service is not clear yet, due to the fact that the business model is under construction. However it is clear that the cost components will at least consist out of costs for product development, marketing, sales, hosting, external data sources, usage of third-party software components, etc.

As for partners needed in the business model to offer the service, the organization thinks of:

- Pilot customers,
- Software vendors of Transportation Management Systems (for integration purpose),
- Software platform providers, e.g. Port Community Systems,
- Event data providers (for all kinds of relevant data).

The competitors which are foreseen, consist out of:

- Comparable products, but not with the same functional scope and target customers: Agheera Telematics, DHL Resilience360 Incident Monitoring, RiskMethods Supply Risk Network, Resilinc SupplyIntel;
- Technical components without logistics-ready implementation: TIBCO Spotfire Event Analytics, SAP HANA Smart Data Streaming, Microsoft StreamInsight, etc.

The startup’s services will be targeted in general at all companies involved in cargo transportation. For transportation planners, the startup offers a comprehensive transportation monitoring service that includes numerous kinds of internal and external data sources. For other participants of a transportation execution, like TSPs, trans-shipment centers (ports, airports, train terminals, etc.) and warehouses, the startup offers a service infrastructure for real-time information exchange optimizing process lead times. Users will have two options for using the startup's services: directly integrated in their legacy systems via web services or as a standalone web app.

The startup’s target customers will be approached via direct and indirect sales activities. One of the main channels for the first sales activities will be the pilot customer and its network of partners. The startup will strengthen its public visibility by connecting to media and being present at conferences and trade fairs. Direct sales activities will subsequently follow. In order to promote the startup’s web app, the startup will use the means of online advertising, search engine optimization and phone call sales.

The startup’s product development has started in October 2015 and will be jointly integrated with an integration project with the startup’s pilot customer. The startup’s plans to publish a demo version of its web app until January 2016 and will offer paid plans for full usage of the web app subsequently after further tests and customer feedback. Web service integration of the startup’s services will be firstly developed for the pilot customer and will be publicly available in autumn 2016. Accordingly, activities for targeting the customers will be started right from the beginning in October 2015 in order to attract users for the web app and the web service integration for which sales cycle duration of about a year is expected.

9.3 PTV

The component which PTV has provided during the project is the enhanced routing/ intermodal planning and control application, including web interfaces and ETA calculation.

PTV is interested in continuing to develop two components of the GET Service system:
1. The intermodal planning application;
2. A component for accurate ETA calculation for multi-modal routes.

The activities PTV needs to perform in order to exploit the results are:

- Integration of the two components into the existing PTV products;
- Further development towards stabile applications;
- Development of new business models and creating real business cases;
- Share knowledge internally for other system developments within PTV.

The benefits PTV that are gained from the GET Service project and will be used in practice are:

- Experiences with the interface definitions and interaction between different distributed components;
- Usage scenarios can be considered when setting up other related use cases and business models.

When in the exploitation phase, the customer of PTV needs to implement the interfaces to its own components (for instance a Transport Management System). The value-in-use for the customer is being able to establish an enhanced planning, due to (faster) availability of more reliable information.

The exact benefit and cost when offering the service is to be determined yet, due to the fact that the business model is currently being elaborated. The ETA calculation for road transport will be available as part of the new PTV Product Driveandarrive. It is already accessible as prototype via Web service and can be demonstrated within the Scenario 3. For the multi-modal use cases further developments of the ETA Service are being planned. The redevelopment and integration in the existing products is an important factor in determining the actual cost and benefits. These activities are currently being performed.

For the intermodal planning applications as well as for the real time transportation control components PTV is aiming at potential customers from the logistic service providers area. Currently one project with a pilot customer is running regarding the intermodal data manager and the intermodal routing service. The developments are ongoing for the next 6 to 8 months. Further marketing and business development activities are planned throughout the next fiscal year. The exact price is not fixed yet and depends on the use case, the number of users and involved assets as well as the overall transport network to be covered. Target market size is the TOP 500 of the LSPs in Europe regarding Intermodal planning solutions.

9.4 Jan de Rijk

Jan de Rijk B.V. is a Dutch Logistics Service Provider operating a large modern and diversified fleet across Europe and offers several logistic services.

The target of the research was the daily operation of handling export freight via two modalities and handling the re-scheduling of shifts in freight. This resulted in two scenarios:

- Freight shift:
  "an airplane is diverted from one airport to the other, the planning department has to re-plan up to 30 trucks"
- Export containers from the Netherlands to –> United States:
  "combining automotive parts at a consolidation centre into a container, pre-haul an empty container via trucking, load at the consolidation centre, truck to a train terminal, unload container at end of the train and truck to sea terminal"

Based on these two scenario's Jan de Rijk closely worked together with TU/e, HPI, PTV, Portbase and several other partners in the work packages WP1, task 1.1 and 1.4, WP2, task 2.2 and 2.4, WP5, task 5.1, WP6, task 6.4.

In order to optimize these two daily operations, Jan de Rijk had its focus on three items:

1. Planning algorithms
   Together with TU/e Jan de Rijk Logistics has developed two optimization algorithms. A third one is ongoing at the moment of writing this document (dd.24.Mar.2015)
   a. VAPCI-G; FTL optimization; this optimization considers:
      i. matching freight to empty equipment based on the freight commodity type and colli type
      ii. empty running
      iii. repositioning assets (transport capacity)
      iv. use of TSP's (transport service providers for trucking)

   b. CDPHC; LTL optimization; this optimization considers:
      i. different origin points (each origin point is assumed to be a consolidation centre/ cross-dock)
      ii. different destinations of the shipments that have already been loaded in the semi filled vehicles
      iii. different time windows of the shipments that have already been loaded in the semi filled vehicles
   c. Driver planning; this research is started beginning of 2015 and will not be ready within the time period of this project; this research considers:
      i. driving time regulations
      ii. repositioning of the driver in terms of travel time, travel route and resting locations.
2. Complex Event Processing
   Jan de Rijk Logistics worked closely together with HPI on the Event Handling research item. Jan de Rijk Logistics considers events as an important aspect for optimizing planning (robustness) and reducing re-planning activities. Thus optimizing logistics so that environment benefits in terms of reducing CO2 emissions.
   Currently Jan de Rijk logistics has offered to look into possibilities of using the services of a possible start-up.
3. Intermodal planning
   Optimization in transport capacity is also a goal for Jan de Rijk Logistics. Therefore Jan de Rijk Logistics works together with PTV for their Intermodal Optimization technology.

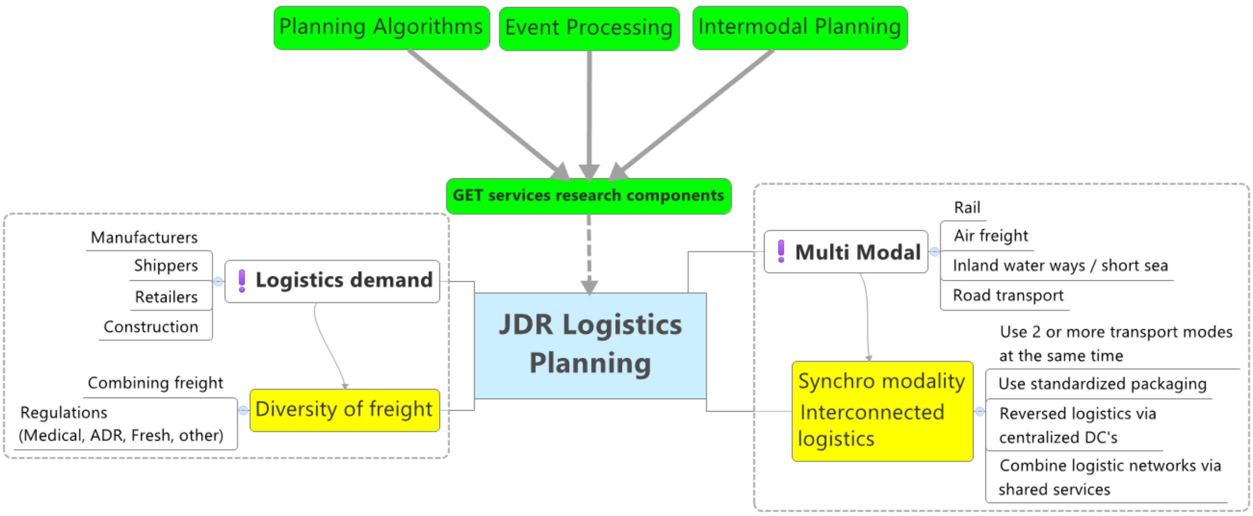


Figure 29 – Jan de Rijk: service compositions

Jan de Rijk is planning on directly using the following components of the GET Service platform in their daily operations:

1. The multi-modal planner and ETA calculation components that will be developed by PTV;
2. The value adding information provisioning services that are being developed by HPI;
3. Planning algorithms that are being developed in WP5;
4. Core components that are being developed by WP2.

Before these components can be used in a daily operation, several future developments have to be carried out. Especially on the side of the central planning system, called Jplexs, Jan de Rijk will do developments for the benefit of the planning department.
It is likely that these benefits will be in terms of:

- Enhance overall performance

- Reduce CO_2 emissions due to less empty miles and use of other modalities (eg Train)
- Reduce re-planning
- Create more robust planning

As a Logistics Service Provider Jan de Rijk services logistics to Logistics Service Clients which can be identified as providers of freight, shippers, retailers, logistics agents and industry. When making use of the GET service and more specific the above mentioned components the value in use will be:
- More efficient use of transport capacities
- Transparency in the logistic chain
- Timeliness

In order to further develop the components so that these can be used by the central planning system and thus by the planning departments, Jan de Rijk will continue to work together with
- HPI and the start-up company
- PTV Group
- TU/e
- Portbase

Jan de Rijk is currently evaluating the GET Service components in order to integrate these components with the current business process of intermodal transportation (focus on truck and rail transport).

9.5 EXUS

EXUS has been WP3 leader and has participated actively in the technical activities of the project. As the main expertise of the company is software its role in the project was mostly relates with software development.

The main component that EXUS provided in the project is a Mobile Application (Mobile Aggregated Routing Planning and Control Services). The mobile application is meant to be used by truck drivers executing various trips for transportation of goods. This application will be their point of interaction with the GET Service Platform enabling to send (e.g. report events) and receive data relevant to their assigned tasks.
Moreover in the context of GET Service project EXUS has developed a match making application. The main scope of this application is to aggregate the information produced by the mobile applications. The application is web-based and is accessed via a web browser. The application aims to be complementary to the GET Service platform and not to substitute any of the functionalities developed. The rationale behind the development of this application is to be used internally by a company as a tool for managing its resources (e.g. trucks) or the ones of its subcontractors (e.g. progress report or truck availability) in close connection with the GET Service platform and its components.

A more detailed presentation of the mobile and match making applications, their components and functionalities are found in deliverables D3.2 and D3.4.

EXUS is aiming at exploiting the Mobile Aggregated Routing Planning and Control Services (mainly some of the functionalities and the overall concept). The exploitation of the results is twofold, and concerns EXUS newly developed tourism platform called Zixpi (www.zixpi.com). The first axis concerns its reusability (integration) of the developed components as part of the development roadmap of the Zixpi product. The second direction for exploitation is the cross-domain transfer of knowledge to the Zixpi product in order to exploit concepts from the GET Service project that can be used for improving the overall Guest Experience.

EXUS will utilize some concepts concerning the events and the basic principles for handling them as these were defined in WP6. This however will be performed under a different domain/context (tourism sector).

The status of the application at the end of the project is that in terms of Technology Readiness Levels [1] the mobile application can be characterized as TRL5 which means that the technology is validated in relevant environment.

As mentioned above the integration of the components developed during GET Service project will be added in the Zixpi road map. For their successful integration their change of scope must be completed first. Moreover for uniformity/conformance reasons slight technological changes are foreseen. Last but not least excessive testing and debugging will take place. The ultimate goal is to reach a very high TRL (TRL8-TRL9) for these components within a 4-month period.
The business plan for exploiting GET Service features is already defined as well as the strategy for further funding all these activities is established.

The ultimate exploitation strategy is to found a spin-off company that will be able to function independently from EXUS and will be able to support, expand and maintain the end-product. In the long run (5-years horizon) and upon the successful commercial launch of the Zixpi product the project team is estimated to exceed 50 people around the globe mainly working in sales/market as well as in the product support and expansion. A revenue model has been made, forecasting the net revenue. Risks for the business model include delays in the delivery as well as in the worsening of external factors (inflation, financial crisis, dramatic currency conversion rate changes etc).

Zixpi is a complex system requiring the cooperation of multidisciplinary teams for its successful completion. The personnel may be divided into two main groups: (1) Technology including engineers, project management, designers and testers and (2) Business including product managers, sales, marketing and administrative staff. The cost structure will include these personnel costs, as well as additional costs like renting of cloud computing infrastructure and electronic marketing activities.

	Y1	***Y2***	***Totals***
Technology			
Engineers + PM	*7*	*7*	
Graphics, UI, UX, TESTER	*1,5*	*1,5*	
Total FTE Tech	*8,5*	*8,5*	
***Yearly** Cost per FTE TECH (€)*	*40.000*	*40.000*	
PERIOD Cost Tech (€)	***340.000***	***340.000***	***780.000***
Business			
Product Mgmt	*1*	*1*	
Marketing Executive	*0*	*1,5*	
Sales People	*0*	*4,5*	
Mgmt & Admin	*0,5*	*0,5*	
Total FTE Business	*1,5*	*7,5*	
***Yearly** Cost per FTE Business (€)*	*30.000*	*30.000*	
PERIOD Cost Business (€)	***45.000***	***225.000***	***270.000***
Totals (€)			***1.005.000***

Figure 30 – EXUS: personnel cost estimation during the Zixpi project

[1] General Annex G of the work programme

Overall the product is expected to start producing positive cash flows within 18-months after the end of Zixpi project. The overall net revenue projection for the next two years after the end of Zixpi on a quarterly basis is presented below:

Proj. End	***Year 1 Q1***	***Year 1 Q2***	***Year 1 Q3***	***Year 1 Q4***	***Year 2 Q1***	***Year 2 Q2***	***Year 2 Q3***	***Year 2 Q4***
	-101.144€	*-75.034€*	*-74.562€*	*-42.664€*	*-9.813€*	*25.251€*	*55.956€*	*96.970€*

Figure 31 – EXUS: 2-year net-revenue projection after the end of the project

The development will be performed internally. In case the cooperation with other partners is required this will be performed in a subcontract basis.

EXUS has created a competitor analysis.

Name	**Description**	**Strengths**	**Weaknesses**
travelmyth.com[2] - Hotel Recommendations based on Your Interests	Travelmyth is the hotel search engine where you can find recommendations for the best hotels based on what you like.	Collecting and analyzing data for hundreds of destinations, hotels and landmarks around the world, algorithmically rank them and return the most relevant results according to travellers' preferences	Hotel specific, no integration with other businesses No profiling No personalization No budget handling
Viator – Travel with an insider [3]	Viator is the world's leading resource for researching, finding and booking the best travel experiences worldwide. Viator joined the TripAdvisor family in 2014.	A TripAdvisor Company-the world's largest travel site. Great repository of activities suggestions and activities booking on destinations.	No personalization, No integration with Hotels, and their Guest Experience services
TripAdvisor - Personalised Hotel Recommendation Feature	A feature that offers custom hotel recommendations for travellers	TripAdvisor, is the world's largest travel site, Data is based on individual preferences and prior searches on the site	Hotel specific, no integration with other businesses No profiling No personalization No budget handling
Egencia[4]	Egencia trip navigator for iPad offers a personalized trip companion for Business Travelers	An Expedia company, operating in 65 countries worldwide.	It only targets Business Travelers. Travel arrangements no integration with

[2] http://www.travelmyth.com/about
[3] http://www.viator.com/
[4] http://egencia.com/en/

			Hotel's Guest Experience services
tripbod[5]	Connecting travellers to local people. One to one local experiences (cooking, sports, culture, art, walking, and photography) promoted and sold by locals to travellers through tripbod e-shop and a personal trip planning online.	Recently acquired by TripAdvisor. Offers Local Knowledge. Peer-to-peer activities selling.	No integration with local businesses and hotels, no personalization. Web-Based, no application
mtrip[6]	Mobile Solutions for the travel industry. Travel guides on iOS and Android and now specific offerings for various segments of the travel industry: tourism boards, tour operators, travel agencies and travel publishers.	Over 2.5 million.Suggested Tours by the tourism board or DMO Trip Genius™: Personalized daily itineraries automatically generated based on visitors' preferences, popularity of the places, open hours, location, etc. Commission for each hotel, restaurant or ticket booking made by visitors through the app	Destination-specific apps, no holistic solution, no integration with Hotel's Guest Experience services

Figure 32 – EXUS: overview of competitors

9.6 IBM

IBM develops logistics-specific orchestration services. In the GET Service project, IBM has contributed to the Process Development Workbench, which is strongly linked to the Process Orchestration Engine.

IBM will exploit the technologies and concepts incorporated in the development workbench after ending the project. It plans to market these services separately with the department that focuses on the application domain of logistics. Jan de Rijk has shown an interest in orchestration services that enables them to quickly and easily develop workflow support for particular customer services, or to facilitate simple changes to particular customer services.

[5] http://www.tripbod.com/
[6] http://www.mtrip.com/

The benefit IBM gained from the project is that the capabilities developed in WP4 for dynamically creating processes and in WP7 for migrating an active business process instance into a new schema will be used to improve corresponding capabilities in the IBM BPM product.

Currently, IBM BPM is predominantly sold in the financial services domain. One of the obstacles to use IBM BPM and similar products in other domains is the effort to create process models from scratch. By making it easier to create process models from existing artifacts, e.g. transport plans, IBM BPM becomes more attractive in general and in particular in other industry domains such as the transport and logistics domain.

The activities IBM needs to perform in order to exploit the results are:

- Re-coding in industry-strength code;
- Creating industry-specific configurable process templates;
- Integration with an existing IBM product: IBM offers the product “IBM BPM” which is an integrated development environment for business process modeling and execution including support for systems and services integration. IBM wants to add the snippet composition capabilities from the Process Development Workbench into IBM BPM (and possibly into other similar IBM products).

The customers that are targeted with this logistics-specific extension of IBM BPM are logistics service providers that run complex variable processes that are supported by interconnected information systems, e.g. companies like Portbase, DHL, and Jan de Rijk. The offering is thought as a package of IBM BPM and other development tools together with logistics specific preconfigured content, e.g. process snippet libraries and adapters.

After the development phase that contain the activities described above, IBM will conduct a first-of-a-kind project with a customer to further test the new capabilities in a production environment. After successful completion, pre-sales activities will be started, in which IBM uses it industry-specific, i.e., “Travel and Transportation”, sales channel to present the new offering to the targeted customers. This is planned to start in 2.5 years after completion of the project.

Competitors for IBM BPM are Oracle and SAP as well as other smaller companies.

9.7 TRANSVER

TRANSVER GmbH is a consulting company and develops some of its services in the context of the GET Service project. They have been especially involved in the development and evaluation of the CO_2 calculator and the evaluation of the GET Service platform as a whole. The consulting experience and knowledge that they have developed during those activities is an intangible result of the project.

TRANSVER intends to continue its work with traffic information as developed in T6.1 as well as the transportation related evaluation (T1.4). The evaluation techniques and knowledge will be applied in future consulting services and reports for transportation information providers. One value of GET service is the selective data from heavy goods vehicles (HGV), because of its unique properties such as steady average speed over long distances and a different set of restrictions (night driving bans, available heights, etc.). The techniques developed with GET Service on HGV data can potentially be used to verify large data sets for instance on traffic information. With their unique properties they are a very valuable dataset on plausibility of traffic information from other sources (e.g. mobile phone data, floating car data, induction loops, radar detectors). By merging different

sources of information the GET Service approach cross-fertilizes other approaches validity of traffic data.
The exploitation differs from other partners as TRANSVER is a consulting firm. The exploitation is therefore typically intangible. It finds its display in technical approaches on how transport data can be evaluated. One practical approach is the level of service (LOS) definition: with the availability of more data e.g. from mobile devices, the current LOS has begun to influence the individual routing of vehicles. Among the customers of TRANSVER are private companies that rely on this information from data providers as well as public bodies, which aim at a collectively optimized route. A specialized consulting firm is frequently used to validate data qualities. By being involved in GET Service this knowledge was deepened and verified with state-of-the-art data from logistics chains. Optimized routes have a collective benefit in reducing frequently individual travel times, but at the same time the same technology can cause other problems such as a congested alternative route or more exposed residents with concerns on traffic safety, noise and pollution. Due to the involvement in the data analysis and by having knowledge about the algorithms in place, this strengthens TRANSVER’s position in consulting customers, who are exposed to these effects of traffic.

The benefit TRANSVER gained from the project is that the knowledge gained can be used as a reference in tenders. It can also be offered as a service in addition to what is mandatory during tendering processes.

The value-in-use which TRANSVER provides to its customers is the expertise in freight transportation as well as its corresponding evaluation with its unique properties in the transportation domain when offering consulting activates to possible clients.

There are no direct competitors as all consulting services and transportation evaluations are customer and case-tailored.

10 Conclusions

In the distributed domain that is transport and logistics, where the need and demand for green transportation is present, agility and flexibility is needed in the supply chains. The current market characteristics are obstacles for creating the flexibility for establishing synchromodal and green transportation.

An integral view on planning, actual operations and real-time events related to transportation is needed. To establish this view, broad information sharing between all relevant and/or possible partners must be in place. A vital aspect hereby is trust: full control over data authorization and authentication of the users of the system. Community Systems, which are widely present in the European domain, are able to provide this needed trust. Trusted connectivity, data authorization and user authentication is part of the service offering they currently provide. The GET Service project and its partners provide important solutions for establishing information-sharing, combining static and event data. Based upon one architecture and agreed-upon interfaces, leading to flexibility.

Another important aspect is agility in business modelling. All partners in the supply chain need to adopt a service-dominant strategy. This implies that the partners need to think of service offering and placing the provision of value as the central focal point. However, most of the current partnerships between supply chain partners are based on long-term contracts. When flexibility is needed, for instance when the planning of transportation needs to be rescheduled, actors should be able to switch to other transportation partners, based on real-time information on criteria as capacity, availability, cost and environmental aspects. In today's market, with the mentioned long-term contracts, this flexibility is simply not there, which implies that alternative options are scarce, and most of the time lead to trucking (flexible, broad offering, relative fast) or to delivering the shipment too late.

Three layers in the architecture of information exchange and business modelling need to be present:

- Stable layer: a centralized and neutral core platform, able of providing standardized connectivity, trust and allow the creation of the needed agility and flexibility;
- Agile layer: business actors must be able to choose their own IT providers and business partners. The BASE/X methodology provides a profound framework to develop the service dominant and agile business models;
- Diverse layer: business actors must be able to choose their own suppliers of devices and be able to switch from for instance geographical context by using different infrastructure platform providers;

The first step for each organization is to create a service dominant strategy, in order to define, amongst others, the abstract value offering, the customers and partners. Next to that, the abstract value-in-use must be made concrete per segment, group or class. The final step is to create the business model, in which the value-in-use is the point of departure, and where all needed partners – including the customer – are involved.

This approach of business modelling provides the needed agility: partners can be replaced by other actors performing the same role. If partnerships need to be changed, for instance due to non-performing or changing requirements due to a diversity in planning or customer demands, this can be managed. By having a partner in the business model responsible and able to provide the needed authorization and trust, the needed agility and flexibility in the supply chains can be established.

The approach provided in this deliverable for business modelling in the transport and logistics domain, based on the distributed business and architecture, is highly useable for the implementation of the European-wide Service platform.

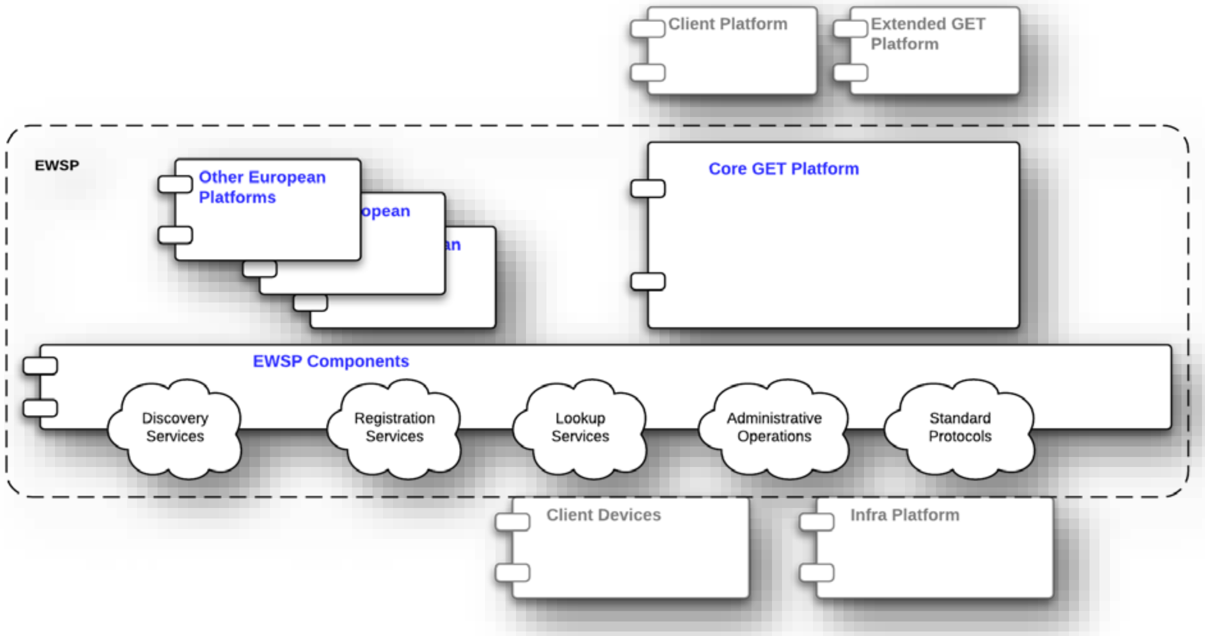


Figure 33 - Implementation of core platforms for EWSP

By having a distributed network of core platforms (Community Systems), via the members of IPCSA and other neutral Community Systems, a circle of trust is present. Large business communities are already connected to and exchanging information via these systems, as the operators of it also provide services. Most relevant for the establishment of the stable part of the architecture, as above-mentioned in the description of the three layers, and business model however, is the provision of the core platform components.

Every business actor, both profit and non-profit, can connect, via its own client platform, to these core platforms. The Community Systems need to adopt the interfaces as delivered in the GET Service project. By doing so, they are able to interconnect, and allow the business actors to be authenticated throughout the entire European transport and logistics domain. This will lead to a very high degree of agility in choosing own trusted partners in the supply chain and hence to a flexible support for Pan-European synchro-modal logistics. When designing the business model for the EWSP, the Community System providers should be involved as partners.

Next to agility for choosing the partners in the supply chain, it also generates agility in choosing the IT and Technology providers of the platforms and devices. All business organizations are able to use own preferred systems. The business services can be adapted to different geographical areas and transport domains. Of importance is that the interfaces as designed in this project are implemented in order to use the same shared reference architecture. Next of importance is that the services of IT providers and their users are registered at least at one of the core platforms, to be able to authenticate and establish trusted connectivity.

11 References

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[3] E. Demir, et al. (2013). A Review of Transportation Planning Tools. GET Service Deliverable 5.1, 56 pp.

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12 Annex – Questionnaire exploitation plans

Questionnaire Exploitation of GET components

This questionnaire aims at gaining information (per partner) on which components as provided in the GET project will be exploited after the project is finished. What is needed in order to have the components and the organizations ready for exploitation?
Please fill in **all** the questions below. The answers / results will be integrated in the deliverable concerning the exploitation of the GET Service project.

1) Partnername

1. State your organizations name

2) Organization description

1. Type of organization (B.V., University, etc.)?
2. Role/nature of organization (LSP, technology/knowledge provider, core platform provider, etc.)?

3) Role in project

1. What was the organizations role in the project?
2. In which work packages was the organization involved?

4) Exploitation of results

1. Which components did your organization provide / contribute to during the project (core components, route planner, methods, algorythms, etc)? Please provide brief description per component.
2. Which of the above-mentioned components is your organization planning to exploit after the project?
3. How will your organization exploit the results (integrate in existing products, new product, use frameworks / knowledge, etc.)?
4. Which knowledge elements from the GET project that your organization did not develop itself will be used in practice after the GET project?

5) Contribution to standards

1. Which parts of delivered components could be put forward for standardization (reference architecture, message implementations, etc.)?
2. Is your organization planning to contribute to existing / new standards? Which?
3. Which standardization organizations/platforms are relevant for this?

6) Status at end of project

1. What is the status of the component at the end of the project (ready for exploitation, proto-type, etc.)?
2. Which activities are needed to have the component ready for exploitation (establishment of organization, creating business model, development of component, etc.)?

7) Exploitation activities

When in exploitation phase,
1. Which activities must be performed by the organization (hosting and maintenance of component, sales, etc.)?
2. What is the benefit for the organization?
3. What is the cost for the organization?

4. What is the value-in-use provided to the market (especially for SME's)?
5. Which partners are needed?
6. Will there be competitors (if any, give examples)?

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13 Annex – Presentations about Exploitation Plans

Portbase. Exploitation Plan GET Service Results. Presented at GET Service Final Event, 1 October 2015. Available at: http://getservice-project.eu/Documents2/01%20-%201430-1545%20-%20Portbase.pdf

Jan de Rijk. Exploitation Plan GET Service Results. Presented at GET Service Final Event, 1 October 2015. Available at: http://getservice-project.eu/Documents2/01%20-%201430-1545%20-%20JdR.pdf

Synfioo. Exploitation Plan GET Service Results. Presented at GET Service Final Event, 1 October 2015. Available at: http://getservice-project.eu/Documents2/01%20-%201430-1545%20-%20Synfioo.pdf

Exus. Exploitation Plan GET Service Results. Presented at GET Service Final Event, 1 October 2015. Available at: http://getservice-project.eu/Documents2/01%20-%201430-1545%20-%20Exus.pdf