PROMOTING INTEGRATED TRANSPORT SOLUTIONS USING A BUSINESS MODEL APPROACH

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ABSTRACT

At European Union level, urban and inter-urban transport services have been traditionally treated as fairly independent sub-systems of a largest transport system. In its 2011 White Paper on Transport, the European Commission call for provision of seamless transport services within the European Union, which imply the integration of these sub-systems. However, integration is hard to achieve owing to their very dissimilar natures (e.g.: ownership, governance, operations, procurement, etc.). The recent pressure over national budgets is reducing the margins for other financial incentives, so the integrated services must prove being commercial attractive.

In this paper, we claim that the commercial sustainability of integrated services depend on the identification of a business rationale for the transport agents. We adopted an innovative approach, based on the concept of business model, to propose prototypes of suitable business models that will contribute to build sustainable integrated solutions. A business model describes a company's way of doing business by specifying where it is positioned in the value chain. Based on a series of case studies, we propose two prototypes of business model to be used in specific contextual conditions. The results evidence the existence of a business rationale in the integration of the transport services, which can be uncover through the concept of business model.

Keywords: Integration, Business Model, .

1. INTRODUCTION

Improvements of the quality of the provision of transport services, across a multimodal network, require an adequate integration of the transport services. This has long been recognised at the European Union (EU) and, over the last decades, vast amount of resources have been deployed to integrate the rather fragmented and modal focussed European Union transport network. Significant improvements have been achieved, yet the EU transport network still exhibits lack of integration, at several levels, including: infrastructure, information, regulation or servicing. Also, the growth in demand has offset some of those benefits and parts of the network exhibit high levels of

congestions, particularly in central European Union, which calls for further improvements.The European Commission (EC) has recently pushed for further integration in its 2011 White Paper on Transport. In its vision, the EC aims to achieve a seamless integration of the EU's transport network, so that a traveller could move seamlessly between any two points. This call necessarily entails the integration of the urban and interurban transport services. However, so far, these two sub-systems of the EU's transport network have been treated independently, at both political and research level.
The difficulty of achieving seamlessly door-to-door transport services is well known. This is even more evident in cases involving long and short distance services as local transport systems typically differ among each other making integration hard to obtain. The main reason being the transport agents lacking incentives to integrate: not only it brings costs as well as the benefits are often unclear. The traditional approach either involves giving incentives to operators, but this is increasingly unsustainable as public budgets are diminishing; or forcing integration through regulation, but this often leads to resistance and antagonism. It is thus natural that upon the incentive period ceases the services are often discontinued. Instead, the success of an integrated transport service largely depends on the benefits generated to every stakeholder. Therefore, conditions should be created to the deployment of profitable integrated services.
In this paper, we claim that a business approach is required in the promotion of integrated transport services. A business approach enables the identification of integrated transport services that are commercially successful or, alternatively, to the identification of the bottlenecks that are preventing the implementation of the services. We propose a set of prototypes of business models for improved intermodality. The prototypes offer guidelines for the deployment of successful integrated services.

The paper is structured as follows. Section 2 describes the methodological approach adopted in the development of the prototypes. Sections 3 and 4 review, respectively, the state of the art on the barriers for improved intermodality and on business models. Section 5 presents the case studies that supported the development of the business models, while Section 6 describes in details the prototypes. Finally, Section 7 presents the conclusions and provides recommendations for further research.

2. METHODOLOGY

The methodological approach deployed in the research was based on a set of case studies. The case studies provided the information about the current missing links and served as test bed for the prototypes of business models. Yin (2003) writes that case studies have distinct advantage "when a 'how' or 'why' question is being asked about a contemporary set of events, over which the investigator has little or no control" (pp 9). Because both, the object is not removed from the context, and both object and context are simultaneously investigated, case studies follow a holistic approach over the object of analysis, which allows for the full understanding and meaning of object of analysis's original properties.

The rationale underling the validation process of the prototypes was the following (Figure 1). The prototypes were induced based on the analysis of the current case studies. Upon the induction, for each case study, new business models were deducted based on the prototypes. The potential gains (if any) in quality of the intermodal transport service achieved through the deployment of the new business models were calculated. The gains in quality are evidences of the validity of the prototypes, because the business models were derived from the prototypes.
A total of seven case studies were elaborated (Lundin et al., 2012) embracing different modes of transport, geographical location or cultural contexts. Figure 2 maps the case studies accordingly with the involved modes of transport. Follows a brief description of each case study.

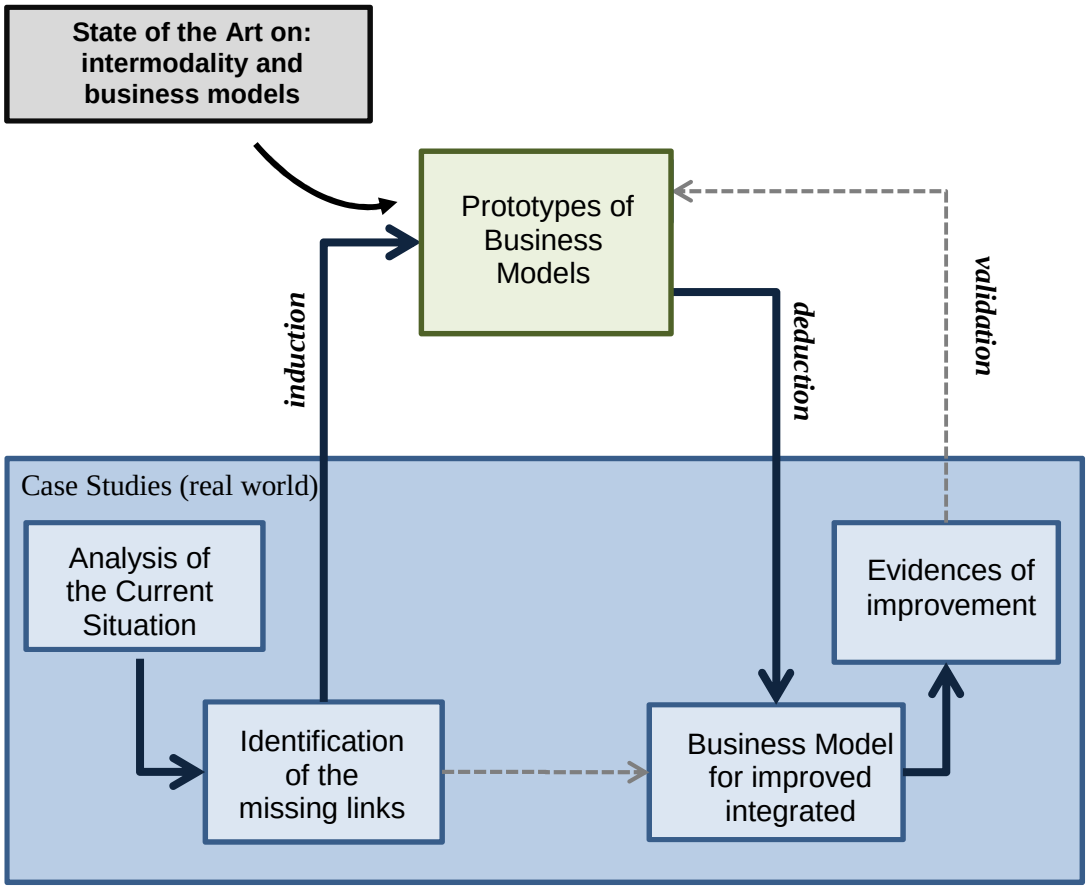


Figure 1 - Validation rationale of the prototypes of business models

Hahn Case Study (CS1) - Frankfurt-Hahn Airport is a commercial airport located in Rhineland-Palatinate to the west of central Germany. Customers perceive the access / egress situation as time consuming and not very satisfactory which is due to the geographical location of the airport. The intermodality and interconnectivity gaps are related to interconnectivity barriers which relates to improving physical interfaces.
Faro Case Study (CS2) - The airport of Faro is the main gateway for accessing the touristic region of Algarve, in the south of Portugal. Only road based connections are offered at the airport. The nearest train station is located in the city centre of Faro. The

available transport services are: public bus, private bus (shuttle), taxi, rented-cars, or private cars. The intermodality and interconnectivity gaps are related to absence of integration between the air and the land base legs.

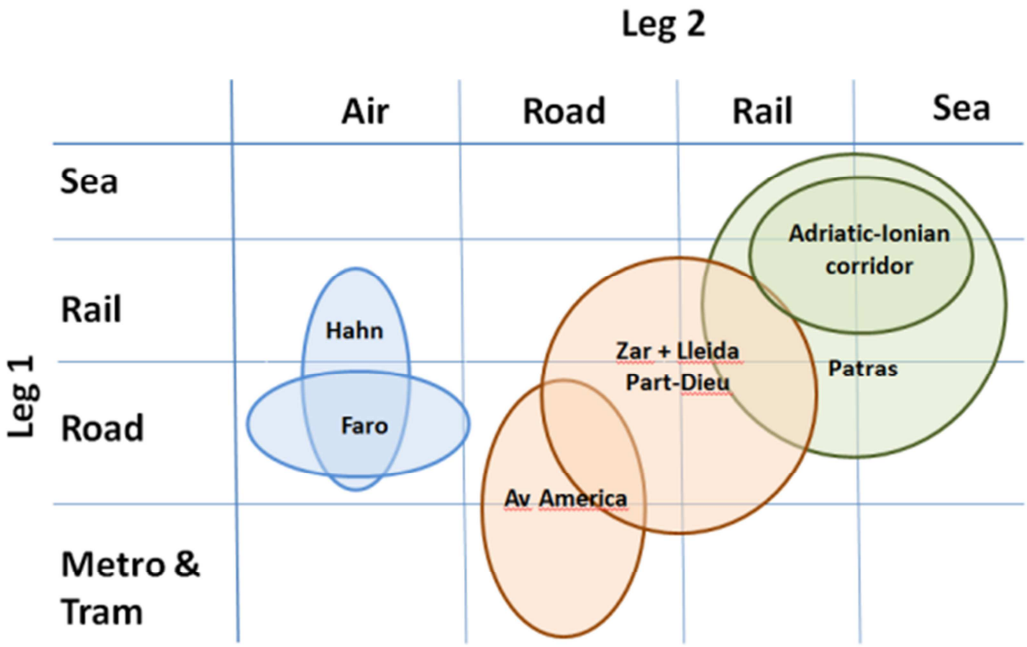


Figure 2 – Case studies

Av America Case Study (CS3) - Avenida de América is an interchange located in the city of Madrid. The specific problems of the cases study can be classified into three groups, including, bad information or signalling (e.g.: according to the surveys this issue should be improved, lack of physical integration (e.g.: insufficient number of quays (which does not allow operators to offer more destinations, bad organization of the motorized mobility around the interchange), non adequate relationships between agents (e.g.: there is a lack of coordination among the different stakeholders, particularly between Transport Operators, which results in a lack of coordination among short and long distance modes).

Zar + Lleida Case Study (CS4) - Zaragoza and Lleida are two Spanish cities located in the North, 150 km distance one from the other but very well connected, especially by High Speed Railway connections. The specific problems of the cases study can be classified into three groups, being: bad information and signalling (e.g.: no integrated information provided for all existing modes at the Stations, but separated information systems for bus and train services), physical integration (e.g.: at Zaragoza Station there is a physical barrier (a fence) between the railway and the bus station, thus passengers have to walk a long distance to get one or another), and relationships between agents (e.g.: both the Terminal Manager and the Decision makers are appointed by Adif, the owner of the railway infrastructure, both too focused into railway services, not in intermodality; which results in a lack of collaboration).

Part Dieu Case Study (CS5) - The Part-Dieu station is today one of the most important station in Europe for transit passenger traffic. Missing links can be summarized within the six following items: real-time information system to

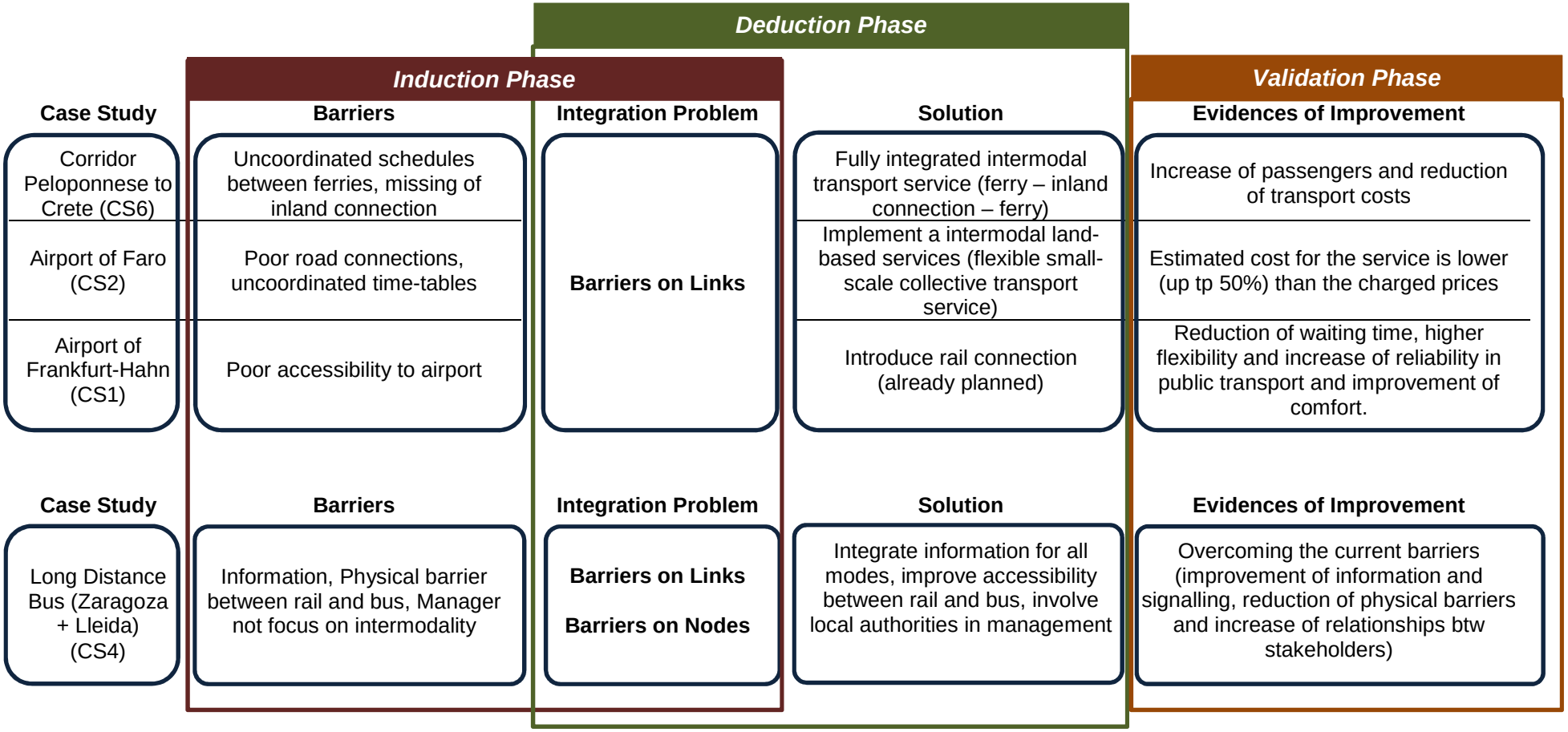
passengers/transport operators and terminal manager on the station, timetable synchronization for interconnected modes, signage improvement to access to facilities (other than shops) and linked sound signposting, passengers corridors inside the station to regulate traffic flow, accessibility facilities – mainly for disabled persons, and waiting time areas with seats and facilities to occupy waiting time.

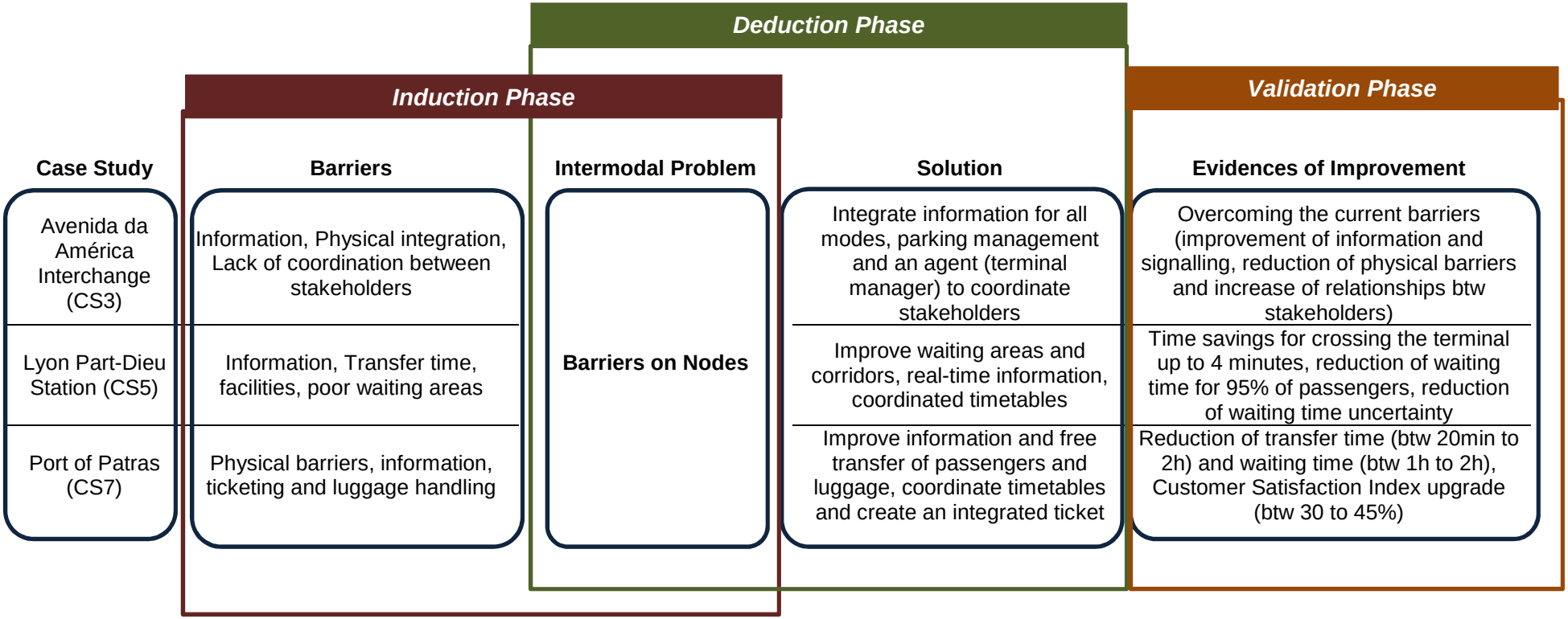
Adriatic Ionian Corridor Case Study (CS6) - In the current situation, the maritime transport (ferry) services linking continental Greece to Crete are mainly based on the Piraeus hub port. The proposed case study examines the conditions for the successful creation of an alternative integrated intermodal passenger service from Adriatic- Ionian corridor to Crete through the Peloponnese, avoiding deviation through Piraeus. In addition, the future business model includes a second –enlarged- alternative, including new touristic services.

Patras Case Study (CS7) - The Patras Port consists of a Passengers Port which handles an important part of the total passenger's sea traffic between Greece and other countries and also of a Commercial Port. The main problems and opportunities for the port of Patras include: the long distance between the main port area (passengers' waiting area) and the platforms, for which the passengers are compelled to traverse carrying their luggage, the inadequate, and the lack of cooperation among the transport (and the other) stakeholders of the port.

Error! Reference source not found. summarises the relevant characteristics of the case studies for the development and validation of the prototypes.

Table 1 - Development and Validation Phases of the Prototypes of Business Models




Deduction Phase
Induction Phase
Validation Phase
Case Study
Barriers
Intermodal Problem
Solution
Evidences of Improvement
Avenida da América Interchange (CS3)
Information, Physical integration, Lack of coordination between stakeholders
Barriers on Nodes
Integrate information for all modes, parking management and an agent (terminal manager) to coordinate stakeholders
Overcoming the current barriers (improvement of information and signalling, reduction of physical barriers and increase of relationships btw stakeholders)
Lyon Part-Dieu Station (CS5)
Information, Transfer time, facilities, poor waiting areas
Improve waiting areas and corridors, real-time information, coordinated timetables
Time savings for crossing the terminal up to 4 minutes, reduction of waiting time for 95% of passengers, reduction of waiting time uncertainty
Port of Patras (CS7)
Physical barriers, information, ticketing and luggage handling
Improve information and free transfer of passengers and luggage, coordinate timetables and create an integrated ticket
Reduction of transfer time (btw 20min to 2h) and waiting time (btw 1h to 2h), Customer Satisfaction Index upgrade (btw 30 to 45%)

3. BARRIERS FOR IMPROVED INTERMODALITY

For each case study, potential barriers for improved intermodality were located (**Error! Reference source not found.**). The Case Studies differ substantially at several levels, such as: types of modes of transport, element of analysis of the transport service (e,g,: terminal, corridor, etc.), geographical location, or legal context. Nevertheless, similarities between the problems affecting intermodal transport are visible and identifiable. We have concluded that the barriers can be clustered in two groups of fundamental barriers or gaps. The gaps are:

- **Type 1: Barriers related with the Intermodal links –** the barriers are related with lack or poor integration of the transport services that, consequently, undermine the performance of the intermodal transport. In this type, problems reach farther than just at the point of connection of services.
- **Type 2: Barriers related with the transfer node –** the barriers are related with the inadequate characteristic of the intermodal transfer point, the make difficult the transfer process between the modes of transport.

Error! Reference source not found. identifies the barrier in each case study. In what concerns barriers of Type 1 (link), they may arise due to either a missing link or a low quality link. In the former case (missing link), there is no short distance transport service to integrate with the long distance. Passengers travelling in the long distance service, when arriving to destination, have no integrated service for the short distance. Instead, they have to build their transport chain, leg by leg. Case studies in this situation include CS1, CS2, CS4, CS6. In the latter case (low quality link), there are short distance transport services, but the integration level is so poor and low quality that, in practical terms, the passengers have to build their transport chain leg by leg. Case studies in this situation include CS2.

Practical examples of these barriers found in the case studies include the following list:

- Non-coordination of schedules (e.g.: CS2);
- Absence of (short distance) service (e.g.: CS1 and CS6);
- Non-tariff integration (e.g.: CS4);
- No joint marketing initiatives (e.g.: CS1);
- Incomplete information (e.g.: CS1);
- Lack of strategic alignment between agents (e.g.: CS6)

Looking now to barriers of Type 2 (Node), three types have been identified, namely:

- Logical barriers (Case Studies: 3, 4, 5, 7)
- Physical barriers (Case Studies: 3, 4, 5, 7)
- Institutional barriers (Case Studies: 3, 5, 7)

Each type of barrier presents specific characteristics and properties. In what concerns the logical barriers, examples include lack of or unclear information to passengers, on either the transport services (routes, frequencies, tariffs or schedules) or on the layout of the terminal (location of quays or ticket machines). The physical barriers are those that appear in a wider array of forms and aspects, in overall terms they are all related with the inadequate architectonical and functional design of the terminal. Such inadequacy induces multiple problems, such as: lack of or low legibility (difficult to understand on how to move between places); long walking distances, location of related functional areas in different floors, etc.) or, even, lack or insufficient equipment to easy movement within the terminal (lack of elevators, escalators, etc.). Some case studies also identified as a barrier for intermodality, the low comfort of the stations. Comfort is related with the adequate illumination, perception of safety, or temperature, as well as properly dimensioned seating areas when there are services with low frequency of departure.

Finally, in what concerns the institutional barriers, the typical one was related with an inadequate governance structure of the transfer point. Indeed, multiple stakeholders operate within a transfer point. However, often their roles are not clear or are incorrectly assigned, resulting in a highly bureaucratic and inefficient system. In Case Study 4, the transport operators can only formally communicate with each other through a ladder in the respective hierarchies, which in practical terms prevents any communication.

4. ANALYTICAL FRAMEWORK FOR BUSINESS MODELS

Business Model is a buzz word concept in the business and scientific world. Indeed, the literature is populated with multiple definitions and there is no generally accepted definition of the term ‘‘business model’’. Diversity in the available definitions poses substantive challenges for delimiting the nature and components of a model and determining what constitutes a good model. Moreover, the business model term has been referred to as architecture, design, pattern, plan, method, assumption, and statement (Morris et al., 2003).

Business models describe or prescribe more specifically how resources are combined and transformed in order to generate value for customers and other stakeholders, and how a value generating company will be rewarded by its exchange partners that receive value from it (Magretta, 2002). Conceptualizations of business models increasingly suggest that a firm can have several business models. Whereas strategy emphasizes competition, business models build more on the creation of value for customers (Morris et al., 2003). In that respect business models are typically developed from a more narrow perspective that a strategy. Business models relate to value chains (Porter, 1985), value streams (Davies, 2004), and value constellations (Normann and Ramirez, 1994) among multiple business actors. However, how business models are configured and combined in project business is largely unexplored territory (Wikström et al., 2009).

In other words, for business models, the quest is to identify the elements and relationships that describe the business a company does. Thus, the business model

concept can best be understood as a conceptual view of a particular aspect of a specific company. The meta-model then defines the words and sentences that we use to describe this view (that consist of elements and relationships that reflect the complex entities that they aim to describe) (Osterwalder et al., 2005).

In face of the multiple proposals, this handbook follows the proposal brought forward by Alexander Osterwalder. This author defines business models as being "the rationale of how an organization creates, delivers, and captures value" (Osterwalder, 2004). Accordingly with this author a business model is the description of the value that a company offers to one or several segments of customers and of the architecture of the firm and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams (Osterwalder, Pigneur and Tucci, 2005). A prototype of business models is a "thinking tool" (Osterwalder, 2010, pp 162) to support and guide the actual development of the business model by the interested stakeholders. As Osterwalder writes "prototypes of business models may be thought-provoking – even a bit crazy – and thus help push out thinking. When this happens, they become signposts pointing us in as-yet unimagined directions rather than serving as mere representations of to-be-implemented business models" Osterwalder, 2010). As such, a prototype does not intend to provide a rough or fixed picture of what the actual business models should be, but simply to guide and present suggestion for the design of superior business model. Consequently, the prototype must focus on key or fundamental aspects of the business model and, thus, indicating directions and paths for exploring alternative designs, which ultimately will lead to superior business models.

Figure 3 presents the framework – or canvas – as proposed by Osterwalder for the analysis of business models. The author claims that any business model can be fully characterized in nine dimensions – or building blocks, being: Customer Segment; Value Propositions; Channels; Customer Relationships; Revenue Streams; Key Resources; Key Activities; Key Partnerships; Cost Structure.

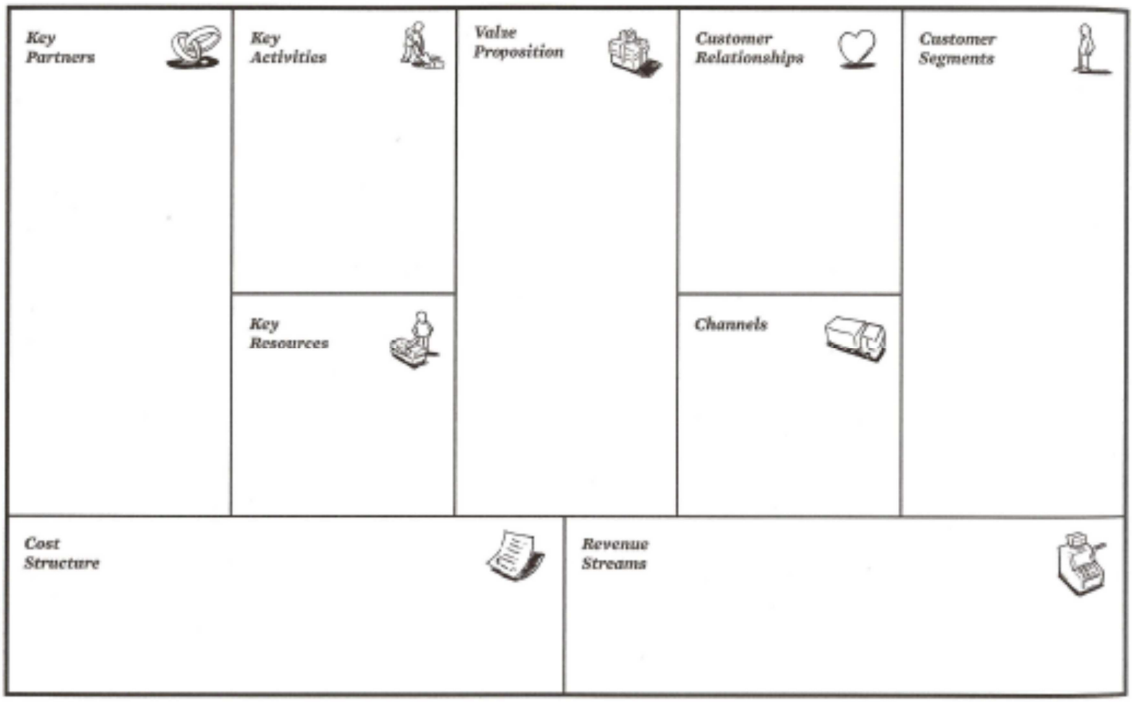


Figure 3 - Business Model Canvas (source: Osterwalder et al., 2010)

- Customer Segment – specifies for whom are the company creating value since an organization serves one or several customer segments;
- Value Propositions – it seeks to solve customer problems and satisfy customer needs with value propositions;
- Channels – Value propositions are delivered to customers through communication, distribution, and sales channels;
- Customer Relationships – are established and maintained with each customer segment;
- Revenue Streams – result from value propositions successfully offered to customers;
- Cost Structure – reflects the mix of activities performed to achieve the value proposition;
- Key Resources – the assets required to offer and deliver the previously described elements;
- Key Activities – activities, distribution channels, customer relationships and revenue streams that the value proposition requires;
- Key Partnerships – some activities are outsourced and some resources are acquired outside the enterprise;

Osterwalder's canvas can be interpreted as follows. Any organization serves one or more customer segments, by serving their problems and satisfying their needs through

value propositions. The value propositions are conveyed to customers via multiple channels (including: communication, distribution or sales). Consequently, customer relationships are established, nurtured and ideally reinforced over time with each customer segment and through a continuous adjustment in the value propositions. Indeed, successful value proposition will result in good customer relationship and in a permanent revenue stream, which is the ultimate goal of any company. Key activities are required to fulfil the value propositions. Some of these key activities are produced by key resources while others are outsources and even acquired outside the enterprise, through key partnerships. Naturally, the various elements of the business model, in particular, the key activities, key resources and key partnerships, results in the cost structure of the activity.

5. PROTOTYPES OF BUSINESS MODELS

In this paper we propose two prototypes of business models. Each one is meant to provide guidance and point paths for overcoming a specific gap for improved intermodality. The presentation of the prototypes of business models will follow the framework of Osterwalder for an easy interpretation.

Business model are commonly utilized to describe the activity of a given company or organization. In the case of an intermodal transport service, we have multiple stakeholders with different perspectives and objectives. As such, there is the need to define the perspective from which the prototype is designed. In this paper the perspective is from the agent responsible for promoting quality in intermodality. This agent varies from case to case being necessary to identify it in each application, for example: terminal manager, public institution or regulator, or transport operator.

Prototypes of Business Models are sketched in the next two diagrams. Both prototypes are presented in simultaneous as we believe that in this way the presentation gets clear and simple. This also allows identifying the common aspects and the main differences between the two prototypes. The two prototypes of business models are presented in Figure 4 and Figure 5.

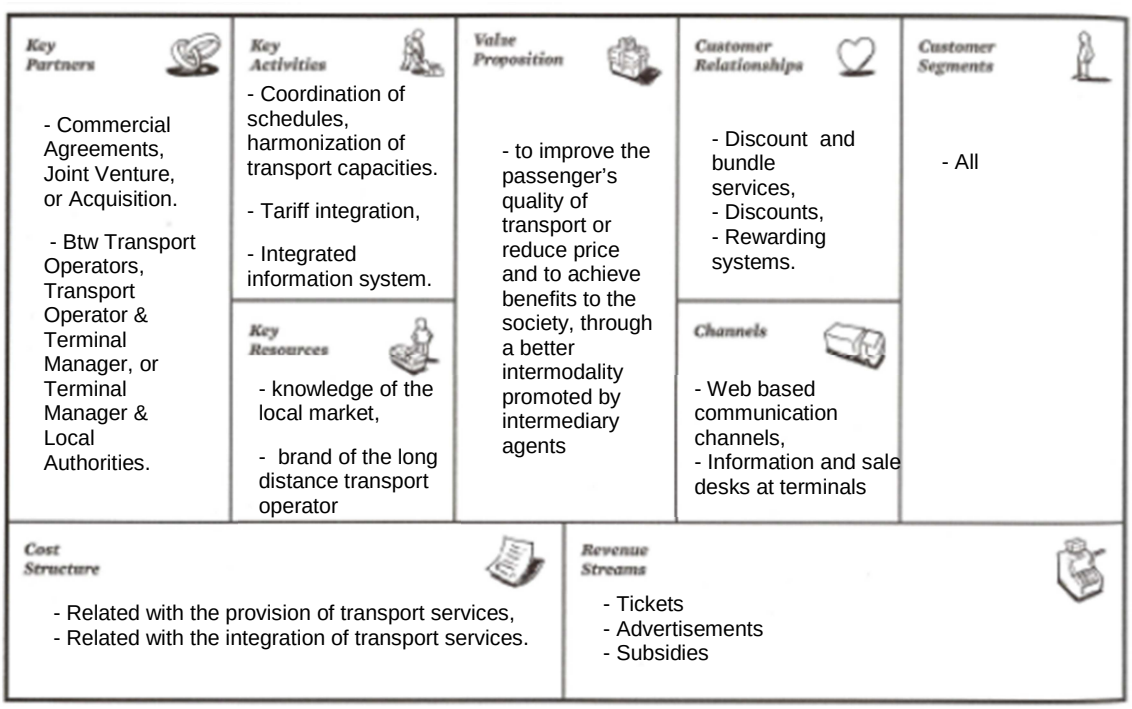


Figure 4 - Prototype Business Model Gap 1

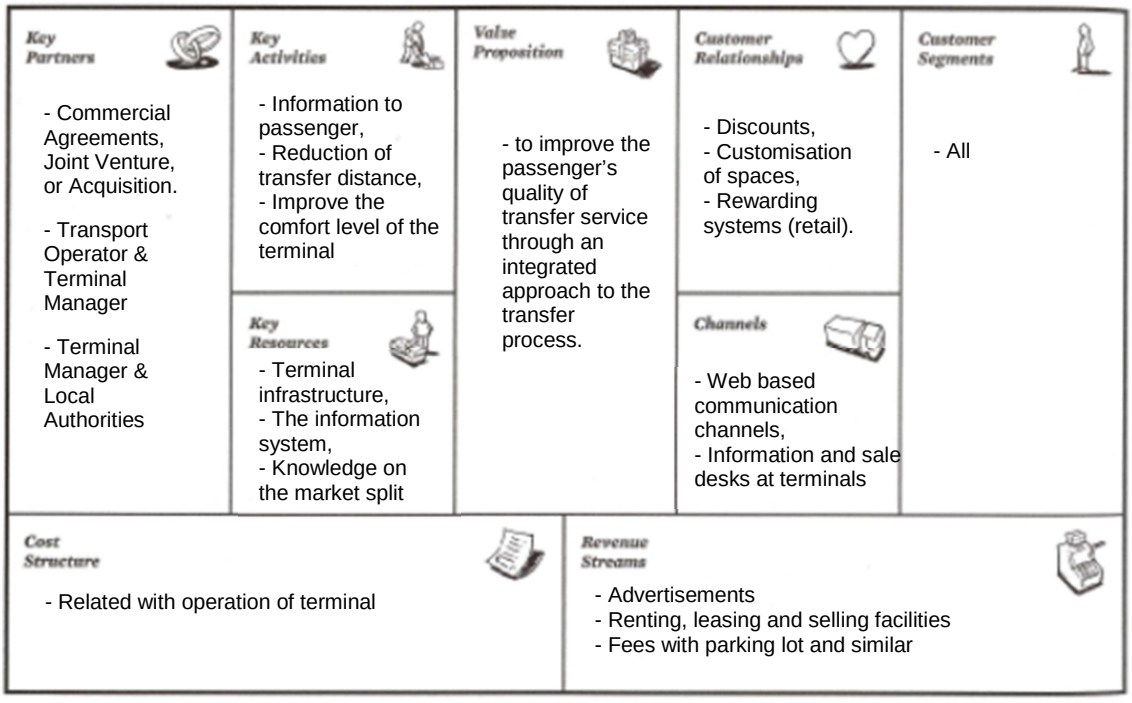


Figure 5 - Prototype Business Model Gap 2

We now briefly discuss the building blocks of the business model framework proposed by Osterwalder.

Value Proposition (VP)

In the case of Prototype for Gap 1 the value proposition can be described as: *to improve the passenger's quality of transport or reduce price and to achieve benefits to the society, through a better intermodality promoted by intermediary agents*.

In case of Prototype for Gap 2 the value proposition can be described as: *to improve the passenger's quality of transfer service through an integrated approach to the transfer process.*

Customer Segments (CS)

In both prototypes all customers are included. Yet, segmentation may be required to define tailored or differentiated services.

Channels (CH)

The choice of the channels depends on the actual case. The key ones include, face to face (or voice to voice) channels, paper-based channels (such as: leaflets, maps, brochures and posters), technological devices (such as: handhelds, smartphones, tablets and even digital boards), or websites, e-mail contacts and other social network contacts (such as: Facebook). Web based channels have major advantages including the possibility of offering real time information and interaction with the passengers. Also, owing to increasing popularity of social networks, these are becoming fundamental channels for advertising and capturing the passengers.

Customer Relationships (CR)

In what concerns Prototype of Gap 1, the customer relationship must thus target both attraction and retaining of passengers. There are several solutions to achieve these goals, for example: offering discounts or bundles of services. In Prototype of Gap 2, the customer relationship has a different nature. The terminal is often seen as an extension of the transport service. As such the terminal operator may collaborate with transport operator to offer added value services, such as: lounges for customers or discount on parking and other services (as part of transport operators' rewarding system), creation of thematic areas for different passengers (e.g.: playground for youngsters, entertainment areas, or commercial and retail areas).

Revenue Streams (R$)

In what concerns the Prototype of Gap 1, the main revenue streams are related with the provision of transport services. Another transport-related revenue stream is the public subsidies. This stream can be particularly relevant in the case of public transportation. Non-transport-related streams include the advertising on board or through the communication channels.

Concerning the Prototype of Gap 2, the revenue streams are somewhat different. A key factor is related with the fact that the terminal manager does not sell tickets. In this sense, transport-related revenues include fees paid by the transport operators to use the terminal or public subsidies. Non-transport-related revenues stream include: advertisement within the terminal station, renting (or selling) of commercial spaces (such as: retail or other business activities), or parking revenues.

Key Resources (KS)

In the case of Prototype for Gap 1 the resources are diverse and include both assets and capabilities. The main assets are the fleet of vehicles and the information system. Yet, the key resources are related with the capabilities.

The capabilities are related with the knowledge of the local market and with the market brand of the long distance transport operator.

Prototype for Gap 2 has a rather different nature being focus on the terminal, nevertheless, the resources include again both assets and capabilities. The assets include the physical terminal, all of its equipment (such as: elevators or escalators) and the information and telematics systems, in practical terms, the physical objects that are inside the terminal. The capabilities are again very valuable including knowledge about the passengers' needs and preferences, or knowledge on the market split and origin and destination (for example: knowing the origin and destination of passengers is necessary to decide which services are closer and those than can be apart).

Key Activities (KA)

Prototype of Gap 1 dentified three types of activities, being: of operational nature (related with the operations should result in a seamless transport experience to the passengers), of financial nature (related with tariff integration), and of organizational nature (refer to those activities that allow the transport operators to control and monitor the transport services, including the other transport operators' services), such as: integration of the information systems).

Prototype of Gap 2's activities will essentially aim to offer passengers a confortable, easy and simple way to transfer between modes of transport, as such many activities will be passenger-oriented. Again three types of activities are herein proposed, including: information to passenger, reduction of transfer distance, and improve the comfort level of the terminal.

Key Partnerships (KP)

In case of Prototype 1 the following key partnerships are recommended: between the transport operators, or between the transport operators and terminal manager. The former one refers to the stakeholders that are directly involved in the transport operation and therefore are the most influential in the quality of integration of the intermodal transport service. The latter case occurs when for some reason is preferable to establish agreement between the transport operator and the terminal manager. In the case, the partnership between the transport operators is established in an indirect way through the terminal manager. This could be necessary in situation when the direct partnership between transport operators is not possible or feasible.

In what concerns the Prototype 2, although the required key partnerships are similar to the previous Gap, now the most important one is between the terminal operator and the transport operators, since the transfer process occurs within the terminal. Nevertheless, direct partnerships between the transport operators may be necessary. A third partnership may be established between the terminal manager and the local authorities, when this stakeholder has statutory or legal power over operations of the terminal or transport operators.

Cost Structure (C$)

In what concerns the Prototype for Gap 1, the main cost items are related with the provision of transport services and with the integration between transport services.

In what concerns the Prototype for Gap 2, the cost items are essentially related with the operation of an intermodal terminal. These include, for

example: construction and maintenance of infrastructure and equipment, utilities (water, electricity, gas, etc.), human resources or communications. Also, costs of integration may occur and therefore should be taken into consideration. These are similar to the ones described for Gap 1.

6. DEPLOYMENT CASES

6.1. Part Dieu Station Case Study

Part-Dieu station is located in Lyon (France) being the main public transport hub in the region. It is served by rail, bus, car and two-wheel modes at long and short distances. In 1983, at the moment of planning, the expected traffic was of 35000 daily users, but the actual traffic has been considerable higher: i 80000 daily users (2001), and 135000 daily users (in 2008).
The terminal manager - Gares et Connexions – is a unit business of SNCF. It is responsible for the station development and investment plans, in collaboration with other stakeholders.
The main problems impacting the station are (Lundin et al., 2012):

- Real-time information system to passengers/transport operators and terminal manager on the station
- Timetable synchronization for interconnected modes
- Signage improvement to access to facilities (other than shops) and linked sound signposting
- Passengers corridors inside the station to regulate traffic flow
- Accessibility facilities – mainly for disabled persons
- Waiting time areas with seats and facilities to occupy waiting time

A novel business model was developed aiming to overcome these problems (Figure 6). Firstly, there is the need for improving the physical dimension of the station. This refers to passengers corridors implementation coupled with signage improvement and then to a waiting time areas capacities increase. Secondly, there is the need to improve The second improvement is at technological and/or technical levels. It is composed central by a real-time information system for passengers, transport operators and terminal manager. Its aims also to reduce differences on accessibility to facilities between disabled and non-disabled persons, with adapted equipment. Finally, there is also the need to improve the organisation of the transport system with a timetable for interconnected modes, mainly for short and long distances rail modes.

6.2. Faro International Airport

The airport of Faro is the main gateway for accessing the touristic region of Algarve, in the south of Portugal. The airport is located 5 km away from the main city in the region:

Faro. The airport of Faro presents a high seasonality since it fundamentally serves the tourist activity of Algarve region which attraction lies in natural conditions such as sun and sea during the summer. Therefore, there is a structural imbalance between the IATA Summer and Winter demand.

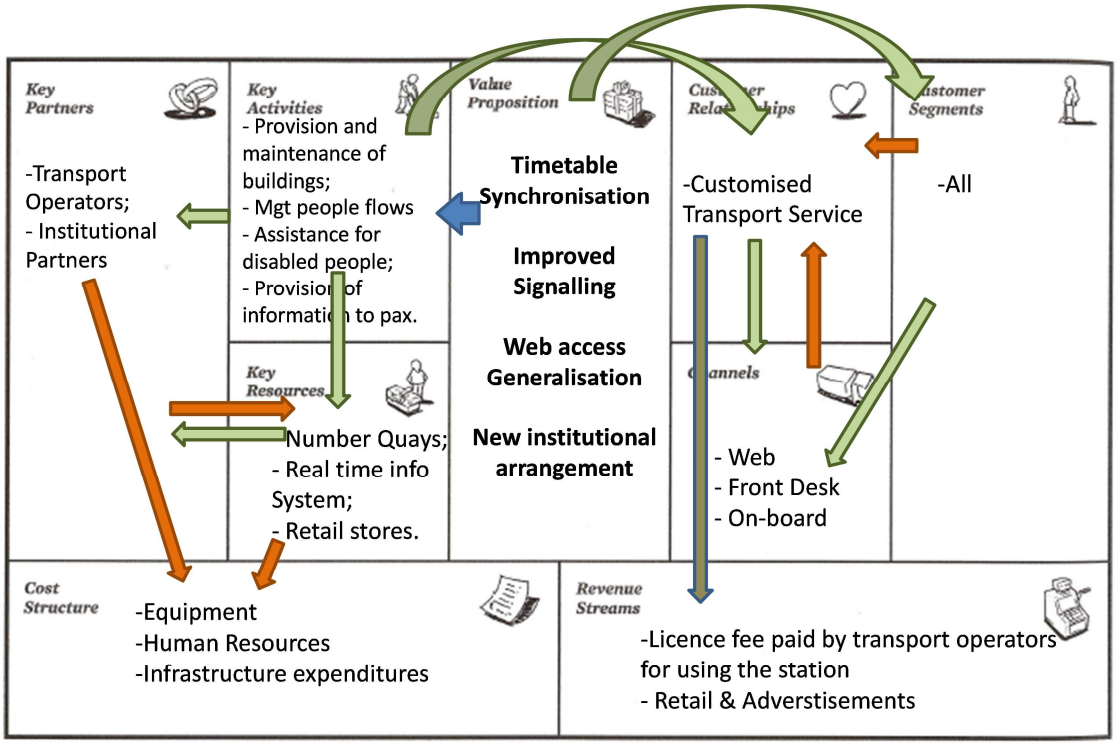


Figure 6 - Business model for the Case Study – Part-Dieu Station

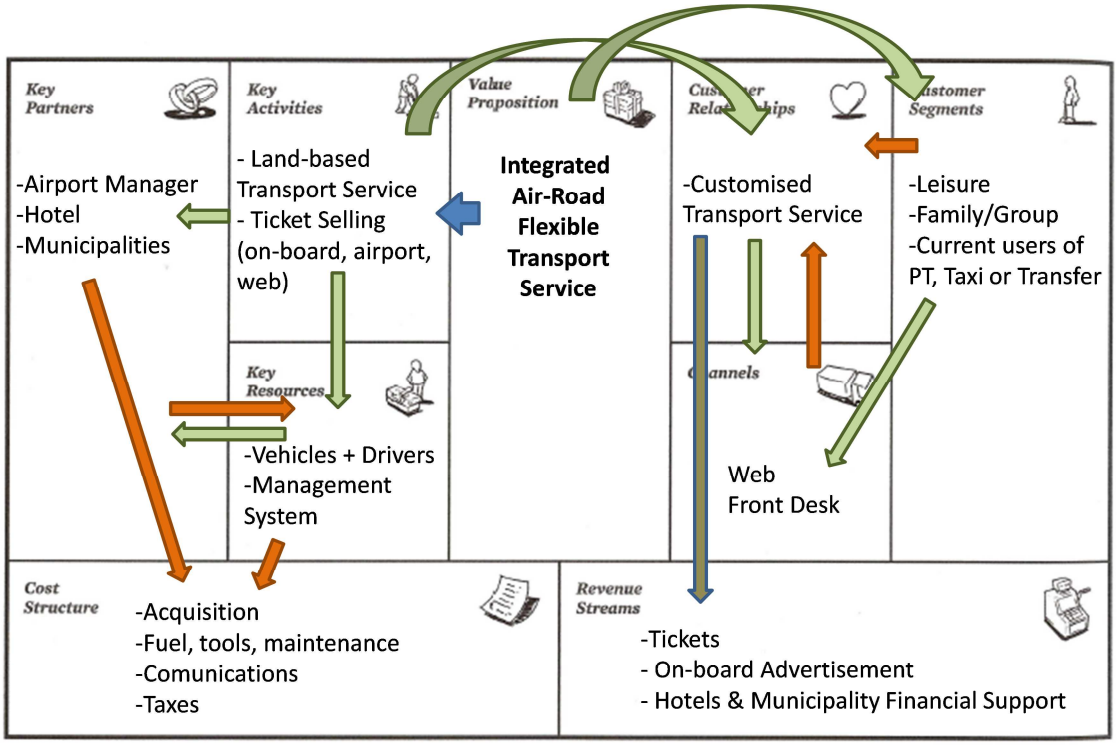


Figure 7 – Business model for the Case Study – Airport of Faro

Only road based connections are offered at the airport. The nearest train station is located in the city centre of Faro. The available transport services are: public bus, private bus (shuttle), taxi, rented-cars, or private cars.
The agents with relevancy for the definition of the business models are:

- Passengers;
- Airport of Faro Manager (ANA);
- Rent-a-Car companies;
- Taxis;
- Public Transport;
- Private Shuttle Companies;
- Hotels.

In order to overcome the current problem and to implement a truly intermodal service between the air and the land based transport services, we propose to include air-land intermodality into the value proposition of the airport. We propose to implement a flexible small-scale collective transport service integrated with the air transport, in terms of tariffs, scheduling and information. The collective transport service will provide transport to some destinations in the region of Algarve. Passengers would be offered a seamless transport journey, since their airport of origin until their final destination in Algarve. By seamless we understand no (or short) waiting time at the airport and direct transport to final destination. In Figure 7 we present the canvas according to Osterwalder for the new business model.
The FCTS operator will concentrate all the information about the new service, including schedules and tariffs. The basic sales channel must be a clearly marked counter on the

arrivals hall, although it is possibly useful to consider from the beginning a web-based sales channel. Another channel is foreseen, which consists in selling tickets on board aircrafts. This will imply the establishment of a commercial agreement with the air

7. CONCLUSIONS

This paper proposes a novel approach, based on the concept of business model, to contribute to the integration of EU's transport network, particularly, the urban and inter-urban networks.
Prototypes of business models have been brought forward for overcoming the existent barriers and to establish the missing links. The analysis of the Case Studies allowed the identification of two primary locations for the barriers and the missing links: in the intermodal links or in the transfer points. The former location refers to problems of integration between the transport services; while the latter location refers to problems inherent with the transfer point that precludes a seamless modal transfer between the long and short distance services.

Changes in the current business models are certainly associated with the possible implementation of these proposals. An assessment to the changes in the building blocks was undertaken. The analyses of the changes provide information about which aspects of the transport services are required for obtaining an improvement in the quality of the intermodality. The analysis of the improved business models considered the existence of fundamental barriers to intermodality, concerning the links and concerning the nodes

The main conclusion from the analysis to the improved business model focused on the links is a similitude in the improved value propositions for overcoming the current barriers to intermodality, that is: implementation of a new service to improve integration. In addition, the proposed business models do not imply significant changes in the remaining building blocks, with the exception of the cost structure that is affected with the introduction of the new service. No changes in the customer segments are expected which denotes that the proposal of business model is not expected to attract different types of passengers, while it should attract more passengers besides improving the quality for the existent ones, which by itself is very positive. The implementation of a new service will have some impact in the key resources and possibly in the key activities, but no major changes have been identified. Likewise, the channels and customer relationships would not be significantly affected. The key activities will remain essentially the same, as the new service is also a transport service.
Looking now into the analysis of the business models focussed on the nodes, the main conclusion is a lack of a unique suggestion for improved value proposition. Indeed, several value propositions have been suggested related with integration of information, governance, and physical integration. Integration of information is related with improving the readability of the terminal stations (in particular, directions and information on arrivals and departures), the physical integration is related with

improving the accessibility to the passengers, in particular to those with reduced mobility. The integration governance is related with the need to improve the relationships between transport operators, terminal managers and local authorities in order to provide a better quality services to passengers. Secondly, another building block that presented considerable evolutions vis-à-vis the current situation is the channels. In all case studies substantial improvements have been denoted. Likewise, the case studies, whose problems are related with the governance, also exhibit evolutions in the building block key partnerships. Thirdly, no relevant changes were identified in the remaining building blocks.

Comparing the results of the two analyses we may reach several conclusions. Foremost, in the set of cases with issues on links the proposed value proposition is rather similar across case studies. This may indicate a similarity of the barriers causing problems in the links and, therefore, the likely existence of a solution to overcome it. Conversely, in the cases with issues on the nodes a multiplicity of improved value propositions were suggested. This shows that the barriers causing problems on the nodes are multiple and more complex than those causing problems in the links. Also, it highlights that a generalisation of the solutions is not likely possible for this type of cases. Consequently, it should also be expected that solving the problems in nodes is more difficult than solving problems with links.

Another conclusion is that the proposed business models do not require major changes in the remaining building blocks (the changes result from the new value proposition), suggesting that improvements in the intermodality level may be possible to achieve with well-defined and precise changes in the business model.

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