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The Evolution in Transport Operator's Corporate Structure: Ownership and Governance

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Abstract

Outsourcing is wide used practice from large companies in the supply chain sector, especially, in transport industries, where world-wide the market deregulation is a continuing tendency towards cost control, service quality and emission mitigation. Many specialists and dedicated suppliers are already emerging with offers to take over parts of the transportation chain, while the booming of start-up companies promote a variety of data-driven applications towards operation efficiency, emission mitigation and revenues generation. Working capital and procurement cost could be more variable and transportation services are more on-demand response than ever in the past and by taken the benefits the digitalization era the shape of transportation business is changing fast, where non-transport revenues leverage by use of data are key driver of the transport companies' business strategy. The balance between insourcing and outsourcing activities are a key challenge for transport sector and this chapter highlights innovation and success factors for the transport industry taking into consideration the digital era wave and best practices, providing recommendations and guidelines to managers, planners and decision makers.

Keywords: transport enterprises corporate strategy, transportation activities outsourcing, managing outsourcing, assessment of outsourcing conditions

1. Introduction

Last decades, the transport industry experienced an essential demand growth corresponded with the e-commerce development and the socioeconomic (welfare) improvements, [1]. Key factor boosting transport sector growth is the deregulation of the transport sector business environment, have been adopted by most of the economies, where new business models have been introduced (e.g. Low Cost Carriers in aviation) generated new demand by providing connectivity to/from remote destinations and stimulated demand in mature markets, [2].

Transport network today, it is totally different compared to the past, where new entries provide additional capacity by new technology fleet, larger vehicles, expanding the transport network promoting connectivity in emerging markets and remote destinations. The existing business environment is highly competitive, especially, in mature international transports corridors (e.g. US-Europe), [3].

Alliances and acquisitions have been extended taken place in transport market promoting collaboration and risk-sharing schemes towards viability of large transport enterprises and market development by offer services even in niche markets served by new entries.

Traditional transport carriers were vertically organized, covering all the operational functions in-house, an approach usually drive to higher operational cost compared to those outsource activities not in the core of transport chain make them more competitive to a globalized market. The competitive liberalized business ecosystem in transport industry, where alliances and acquisitions are key strategies for the international and the multinational enterprises resulting a fast shifting from the traditional all-in structure towards a more outsourcing oriented approach.

While the transformation of traditional carriers is in place, focused on the main advantage of outsourcing that is the cost mitigation, a new framework for subcontracting is growing where the legal responsibilities and business risks are a key challenge for transport enterprises, [4]. Therefore, the condition of contracts is a complicated task for activities related to carrier's core values such as safety, quality of service and branding, [5]. In addition, the introduction of new digital services in sales, pricing, and communication with the client many times rise issues of intellectual property.

New entries in transport business have already establish flexible business models take the benefits of the era of digitalization and technological innovation. In mature markets, cause of rapid technology innovation in vehicles (type of fuels, energy consumption, automations etc.) and the effects of digitalization in offered services to clients (passengers or cargo), the tradition acting framework of a carrier is totally shift from a large work capital-intensive enterprise in early 90s to a more capital-intensive cooperation of today. Digitalization enables this transformation and promote new sources of revenues for the transportation companies and compromising the driving force for cost mitigation, for example, by optimizing the fleet operations (operational cost) and introducing customized services towards penetration in market segments.

In transport industry, the definition of outsourcing deals with the provision of an ongoing service even a business function for a meaningful time extended due to action lifecycle, such as fleet maintenance or rail line operation. Outsourcing not including deliverables from a specific one-off procurement process, service or deliverable, such as the construction of a building or a research project, [6].

This paper key objective deals with the depiction of outsourcing decision framework for the transport sector. Conventional wisdom is to investigate of the transport sector tendencies on keeping inside and outsource activities. The paper layout includes 4 sections, where the market tendencies in supply-delivering are highlighted, the outsourcing framework in transport business is described, aviation sector conditions are given presenting tendencies in the most outsource sector in transport industry, some key guidelines for managers are listed and finally the conclusion and reference section are situated.

2. Market tendencies towards supply-delivery outsourcing

The decision-making framework to evaluate insourcing vs. outsourcing should be based on value analysis of each business function. Each function is weighted in terms of operational capability and the criticality to company objectives including corporate targets. In the analysis several parameters should be taken into consideration, depending on the size of the business, operational complexity of the transport-delivery chain and other factors related to financing, cost mitigation,

risk management and quality control. For enterprises deliver products, the different options could be categorized in three main directions: (a) leveraging internal staffing and technology; (b) outsourcing to a large third-party logistics (3PL) provider, or (c) implementing some combination of the two alternatives.

Leverage internal staffing and technology constitute crucial driver for outsourcing, especially, for companies or business formations that their supply and delivery process is not core of their expertise. Also, many companies organize in-house logistic activities simply because they do not have the scale or the complexity in their supply-delivery operations to warrant partnering with a large transport or/and logistic provider. With a fully in-house scenario, the transport and delivery functions maintain complete control over all aspects of their operations including negotiating carrier rates, planning, optimizing and contain deliveries.

The challenge for transport enterprises is to reach the appropriate level of staff and fleet resources as well as the appropriate transport management capabilities in place. Benefits to the organization include full visibility of distribution process and outputs including a full control of costs at every step. Key challenge in this option is to define the balance between in-house and outsourcing vehicles and staff towards cost control and mitigation, and a step further to determine this balance in the short- and long-term business plan.

A key challenge for the companies for all business units in all business sectors deals with the decision to outsource all supply and production delivery operations to a large transport enterprise (3PL). This option for the companies with complex and/or larger-scale delivery operations, outsourcing all activities to a 3PL transport-logistic provider can be a optimum choice, provided adequate cost control to each product or service they offer. The biggest advantage to turning the supply-delivery function over to a 3PL provider is that transport enterprises have the knowhow in delivery management, use state of the art techniques and advance technology and they have the necessary human resources and fleet to serve the transport needs over time and on demand.

The downside of fully outsourcing to a 3PL is an option frequently led to a cost overhead, meaning that depending of the range of offered services it could result a higher direct cost for the distribution cost, but an significant cost reduction in relevant investments (capex) and in-house operational inefficiencies (opex). Negotiating the 3PL outsourcing contract should include detailed analysis on contract conditions and especially regarding monitoring expectations and performance, therefore, specifications on outsourcing services it's an area would be clearly stated.

In terms of risk management, many companies promote a combination approach, where some functions are outsourced, and some others managed in-house. In this option, they may choose to keep the functions related to corporate performance internally, such as the carrier rate negotiations, planning, and optimization of their own facilities and resources (staff and vehicles). They can then turn the execution of these orders over to the 3PL, which is a capability that all 3PL's must provide simply to remain competitive. This gives the chance to negotiate the strongest rates with their network of carriers and to also optimize how shipments move through the supply chain. They can take advantage of company exiting resources and use of knowhow and intelligence of a large transport provider.

Strategically, there is not a straightforward best option of those presented above. A comprehensive analysis should determine the appropriateness and effectiveness of each option for each enterprise or business unit over time. These analyses may produce differing results based on a company's varying operating geographies, production lines, market share, organizational objectives, and other factors (management obligations etc.). Also, many times the suitable of one year may not

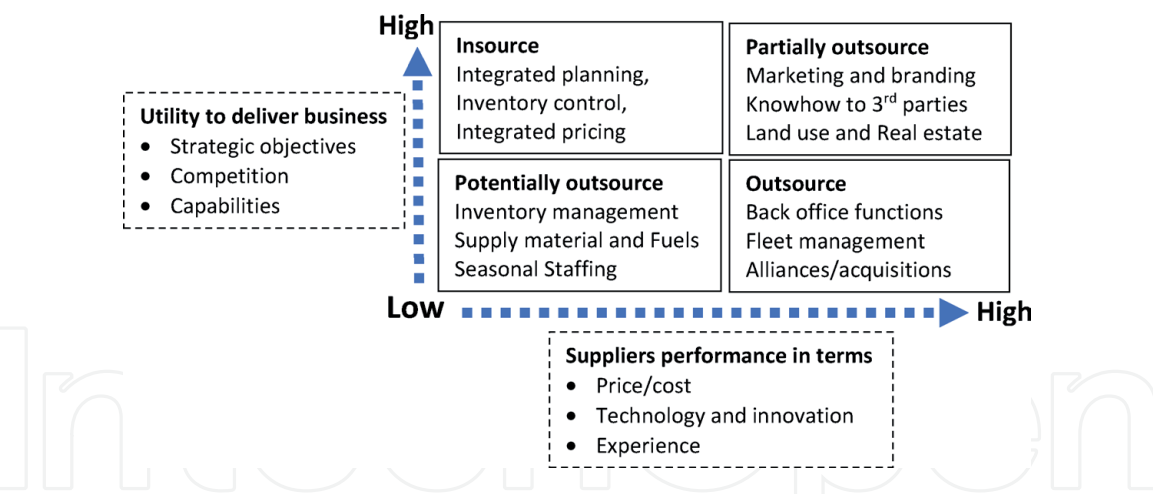


Figure 1.
Orientation towards outsourcing based on business value at risk in transport sector.

the same valuable for the next, therefore, it will be a periodically re-assessment process. These analyses must minimally consider short-term through longer-term impacts relative to costs, benefits, and risks from a financial, operational, organizational, and technological perspective.

Conclusively, in transport sector the strategy towards outsourcing should be based on utility function of the enterprise value chain. Globally, it's a strong tendency to outsource non-transport activities such is back-office support in a range of managerial oriented activities such as marketing, branding, IT, legal services and sectorial partnerships. On the other hand, an insourcing tendency for the cost driven functions such as procurement and fuel arrangements are the success factors towards pricing and profitability, where sometimes related to long-term contracts promoting advantages in competition. By investigation of key tendencies in transport business sector in Europe (research outputs from ENIRISST project, at the acknowledgement section details are given), the strategy orientation large transportation companies is depicted in the following figure (**Figure 1**).

3. Outsourcing frame in the transport industry

To date, many carriers have relinquished control of lower-value functions, such as payroll, human resources management or even slivers of the value chain that are more central to their business. Many shipping, aviation or truck carriers focus their strategy to lease vehicles or fleet for a time or season (e.g., holiday summer peak) even for many years (fleet lifecycle lease contracts), and many times these leasing contracts include the staff to operate vehicles. However, these same companies have seen little reason to let go of higher-value functions, especially, those related to managerial attitudes, such as fleet management, pricing, branding etc. as their scale has enabled them to develop world-class capabilities in-house.

On the other head the data driven business planning orientation is heavily affected the corporate business strategies. In a data-driven world, transport system operators' capabilities could be exceeded by those of their suppliers and this option may lead to greater efficiency and effectiveness, but it also comes with major risks associated with suppliers' power and independency. These risks should be handled carefully considering that an outsourcing arrangement that delivers gains in the short term could, over time, create mismanaged dependency, eroding competitive advantage, impacting corporate strategic targets and shareholder values. Transport companies cannot afford to be isolated from the digital ecosystem's innovation

(e.g. blockchain) forming around every industry, but each action must be carefully developed into the frame of outsourcing without giving away the power of the business to 3rd parties or suppliers.

The key factors that will determine which services are into the outsourcing frame deal with (a) if the outcomes can be clearly defined and provided by a 3rd party, and (b) the supplier's contractual conditions and obligations in terms of risk and benefits sharing mechanism. In a data-driven business actions, there are new dimensions to both, where key factor is the data control and maintenance but also the intellectual property for applications and deliverables.

3.1 Key dimensions of outsourcing

Transport enterprises contemplating outsourcing a function with specific content, description and desired outcomes can be clearly defined and counterpart in a contract where the framework is developed by a collaborative agreement with a 3rd party where the risks and benefits are shared between the parties, and the progress monitored by the transport company. In other words, outsourcing dealing with a production chain task that is not traced by the transport company but for a third party (a supplier) that is fully or partially responsible for the product or function constantly evolved. In outsourcing cooperation, the contractor will commit time and resources but cannot generally guarantee a particular result and not taking transport business risks.

Hence, the key factions related to decisions for business performance, meaning the key managerial components of a company (such as the company accounting) and those actions related with the core business of transportation (such as fleet procurement or vehicle drivers) are hard to outsource, because deals with the key functions that the company specialized in the transport business ecosystem. In a high competitive business environment where agility is a key driver towards cost control and management performance, sometimes the concerns about outsourcing are essential in the terms of risk sharing and intellectual property. Therefore, the direction for spin-off business functions promoting joint ventures or gain-sharing agreements might be more suitable than an outsourcing contract when working with suppliers in this way.

Artificial intelligence is a great supporter of establishing such contracts, providing tools of monitoring and counting the contractor performance and outsourcing potential benefits. For instance, a product delivery company make it easier to assess performance of a delivery outsourcing contract in a region based on spatial (GIS) data analysis receive and storage data through sensors and tracking devices. In the cases that the outsource outcome could specified, defined, and monitored with accuracy, the more the company outsource these functions, the higher are the benefits of outsourcing.

Because the nature of transport distribution channers are to be developed in a non-interrupt operating networks, meaning that the performance in a small part of the network may affect the performance of the whole network, therefore, many times it is very trivial to estimate the added value of outsourcing in the company operational environment. This means that outsourcing may be better to include the component in supply chain it is more straightforward to define an outcome for a whole service, such as railroad line (see the case of London tube network) or bus network of a city (see the bus company in city of Nicosia in Cyprus), than for a small component of that services, such as railroad-track maintenance or just a single bus corridor. In such outsourcing contracts the level of offered activity or capacity is related to the whole performance quantified in the given spatial/geographical line, network, or region.

Key decision issue on the outsourcing content deals with the impact in the transport enterprise value chain. Therefore, many times the transport enterprises prefer more flexible options into the term of “Smart sourcing” is where the outsourcing solution combines the benefits of different suppliers to come up with the optimal solution. This option is in line with the strategy to keep control in the whole value chain and its widely used in aviation and shipping. Its compatible with alliances and merging strategies that are applied, extensively, in these sectors and the benefits for the company opex and branding are decision key drivers.

For the digital intelligent services, a similar type is widely applied, providing more flexibility to transport companies. The “niche sourcing” approach that its very close to above, but its more suitable for cases where no readily available “off-the-shelf” solution exists that fits an transport company particular needs. Smart or niche sourcing is quite often used in large transport infrastructure operators (ports, airports, logistic centers, etc) enabling an operator to combine the best technology with another supplier having a proven track record for managing IT infrastructure, service delivery, and customer service and project management.

3.2 Value at risk

In a data-driven economy, where the high capitalized transport enterprises listed stock market (see sectors of shipping and aviation) valued much lower than the technological oriented enterprises with much lower capitalization, two other sources of advantage are particularly important towards data-driven services outsourcing. The supplier might have data and technology that the company would struggle to replicate, for instance access to a large data pool or a proprietary solution to finding dependencies between large data sets etc. Additionally, it might have skills and capabilities the transport enterprise cannot reach, or it is extremely costly to reach. With demand for people with big data skills outstripping supply, for example, outsourcing could be one of the few practical ways for a resources company to secure the talent required to develop algorithms for predictive maintenance.

When a technological supplier offers a structural advantage in low-value functions in transport supply value chain then the decision to outsource is not hard to be taken, as little value is at risk for the transport enterprise and the advantages could be easily assessed between the parties. But increasingly, suppliers may hold an advantage in functions deemed more critical to the business, such as data mining for the client’s profile or machine learning applications to predictive be, or in an area where, hitherto, the company has held a strong competitive advantage, such as safety, marketing, etc. or operational excellence towards customer satisfaction. In that case companies need to proceed much more cautiously when outsourcing.

The following figure presents how the companies in transportation prioritize their strategic advantages in their core business value chain, giving room for outsourcing. The results are based on reviewing the corporate strategy of large transport enterprises based on US and Europe.

3.3 Data driven economy encourage outsourcing

The digital force for changes in the operational environment of a transport enterprise are essential. Consider an international carrier in air transport sector: it probably already has more data for their client/passenger than even and data mining applications, potentially, maintain their needs better and promote associated services (e.g. food beverage, entertainment, sales or accommodation). It might

make sense, therefore, for maintain the needs of client (passengers/cargo suppliers) to outsource the catering and other on-board services (e.g. entertainment for long-haul travel) rather than develop different menu for each destination or traveler choice and maintain catering in-house.

Large transport companies already employ external technology experts to track and improve the attractiveness of the offered service (resulting additional revenues) providing a better travel experience compared to competition (thus maintain market share) by using the Internet of Things (IoT). The issue is to aggregate the data from many different companies and introduce services and procedures meet the needs of a global market or even specific market segment. The result could be the development of a large group of new services dedicated for specific passenger profiles, where at the end of the day could be a new revenues generator for the company, and a step further to be tailor-made for passengers' profile, needs and habits.

Example is the transport enterprises for passengers, in which, while the main source of revenues because from transport activities in a few decades ago, to date is transformed to a new business model where significant source of revenues could be came from a platform with real time data for consumption in non-transport services or products and algorithms which support customers to spend for their travel needs (e.g. make reservations for a hotel or restaurant or event in the destination city/region).

As with the transport carrier, the insights that a platform operator would be able to generate revenues using these data could be far greater than those any single company could hope to uncover on its own. The prospect then arises of platform companies in unrelated areas, such as product sales, accommodation, banking, and healthcare, moving into the transport value chain. They recognize that companies accommodate passengers (potential clients) for a time is a key benefit for sales or promote services. Microsoft has already launched predictive-maintenance services enabled by the IoT, while a company such as Amazon could deliver a product bought on fly to the address you choose and a company like Google could give you optimum routing in a city or best travel option to intercontinental long-haul travel to an exotic holiday destination.

It is noteworthy that above-described actions are not driven just by the large IT or software or platform companies. The rapid development and introduction to market of new applications and the growing interest for funding start-up and small flexible enterprises provide significant advantages for the smaller ones, while in a useful idea at the right time could be extremely beneficial. Therefore, a small team could, for example, develop the optimum fleet-maintenance tailor-made to the actual needs of the company and to be as intellectual as those of the high branded manufacturing companies in their sector. Also, another group could develop the optimum network planning towards profit maximization or risk mitigation or both and just outsourcing management to a global supplier that can collate data from the hundreds of thousands of sensor-laden vehicles it manages to optimize the fleet's performance. While that were a future fiction in early 90s, today it is a common practice in Travel and Accommodation (T&A) sectors.

Typical example is the aviation industry where passenger's data used to be the core business for an airline or airport. A stream of transaction, tracking, monitoring and other functional data applications each passenger reservation, cargo shipment, or flight operation. Much of this data contains non-public personally identifiable information, especially in the PNR (passenger name record). Airlines also have volumes of proprietary and confidential information related to their business operations and IT assets. Moreover, much data is created in one country and follows a passenger or cargo shipment to its ultimate destination in another country,

while often transiting numerous other countries en-route. Outsourcing adds yet another layer of complexity, in that numerous third parties will need access to airline customer data.

Airlines need to ensure that their agreements with suppliers properly protect the confidentiality of airline and third-party trade secrets and limit the use of non-public proprietary information as required in all applicable jurisdictions. Restrictions on cross-border exchanges of non-public personal information, especially following the model of the European Union, are likely to make this process even more complex. Airlines also need to examine the extent to which data flows relating to money transfers and settlement functions have special money laundering and suspicious activity reporting requirements.

3.4 Outsourcing conditions

Outsourcing suppliers are often perceived as “invisible” insiders or “remote” workers. From the view of top management, the confidentiality rules are crucial towards direct and honest cooperation, where a range of best practices are in place covering a range of conflict of interest during the outsourcing selection partner, non-disclosure legal terms in the contract due to prohibition and non-permission for delivering connected actions for a period after the contract termination. The non-disclosure agreements may not provide any relief against release of information by outsourcer employees, who may often be providing services to competing companies as well.

Offer services even into the company property using company assets many times are not covered by the same obligations and dissemination barriers as it happens for the company employees, and the coordination may be a tight task. Outsourcing arrangements must settle who will have access to company information and especially corporate and client’s data and under what circumstances will facilitate the use and access of such data in the outsourcing arrangement. Considering outsourcing arrangements effected in transport business ecosystem, the key considerations towards efficient outsourcing contracts could be summarized as follows.

- collaboration arrangements need to be based on cost-efficient and performance management schemes (e.g. bonus-malus), therefore, the price arrangements between parties should be flexible, involving from long-term payback assets to rapid development of technological innovations.
- medium-long term contracts is beneficial for the sectors of aviation, shipping and inland transports, while flexibility in innovation is the cornerstone of success for short to medium term contracts in urban transport networks.
- Smart sourcing and niche outsourcing arrangements, although focused, need to be integrated and include provisions dealing with relationship maintenance, substitution of parties to niche markets and partnerships in service customization and transaction services.
- Appropriate outsourcing arrangements should specifically address opportunities presented by joint ventures and alliance arrangements.
- Outsourcing agreements should clearly address who will have access to business confidential data, and under what circumstances, and provide enforceable confidentiality, non-disclosure even prohibit terms in appropriate jurisdictions.

4. Outsourcing tendency in aviation

The air transport industry has seen major changes in the post-deregulation era - almost 40 years after the airline deregulation first took off in the US and extended in Europe in '90s - primarily, because the Low-Cost Carrier (LCC) successful business model and the wide spread of hub-and-spoke networks resulting a dynamic airline industry, an incredibly competitive business ecosystem and a growing offering of capacity and services to the market, [7]. The hub-and-spoke networks enabled airlines not only provide the frame of synergies between the competitor carriers, but also to build partnerships more attractive as the spatial and temporal concentration of flights enabled efficient connectivity among the partners, [8].

The issue of "connectivity" is the cornerstone of modern air network planning and its strongly related to air transport productivity, airline efficiency and airport effectiveness, [3]. Today, the global business environment of aviation based on two main success factors: (a) the risk sharing mechanism between carriers, travelers, airports, and regional market [7]; and (b) the benefits achieved by outsourcing in internal (corporate and operational structure of aviation companies) and external business environment (extended through synergies, multilateral and globe-spanning air carrier alliances and joint ventures due to typical outsourcing contracts in catering and cleaning), [6, 7].

Outsourcing strategy for airlines, IT vendors, MROs (maintenance, repair and overhaul providers), more recent airports and other aviation-related businesses widely adopted many years ago. But last decade, the pace and scope of aviation outsourcing has significantly increased. For example, between 1985 and 1999, the 10 largest U.S. passenger airlines experienced a tenfold increase in their MRO outsourcing, representing more than \$2.4 billion a year in revenues to outsource suppliers, [9]. Airlines outsource many functions to help them focus on core activities, achieve efficiencies, and maintain competitive advantages. The outsourced functions include passenger or cargo reservations systems, accounting and traffic management systems, operational systems (flight operations, crew scheduling, gate operations, ground handling, catering), fleet maintenance, and office systems and functions.

Some of these outsourced functions relate to the use of long-life span assets, such as aircraft and airport facilities, which present airlines with duration issues related to how long the activity should be outsourced - for the life cycle of the asset or a lesser period. Many airlines in the U.S. and Europe historically have provided most of their airframe and engine MRO services inhouse (Delta, Lufthansa, British airways, etc). Today, airlines need to evaluate their outsourcing opportunities at all phases of an asset's life span.

Aviation industry is a leading sector using technology innovation and by taking the benefits of deregulation enforced in 80s in US and 90s in Europe, promote best business practices adopted or extended to other sectors. The introduction of the new type of fleet (more than 500 seats wide body aircrafts, e.g. A380), the growth of door-to-door airline integrators such as FedEx and UPS, the development of budget-oriented ticket pricing model (LCC), the public-private-partnerships in airport development and operation, have transformed the aviation industry. Today's successful business strategy is linked with efficient and flexible in terms of technological changes outsourcing be beneficial for all involved parties, while modeling and technological innovation based on mega data is fast transforming industry towards smart and intelligent business.

Airlines are keen to take the benefits of outsourcing, as a risk sharing mechanism, a cost control tool and brand extension strategy. Airlines strategy focused on branding. They acting to keep high branding strategy promoting collaboration with

world class enterprises in destination marketing, food and beverage and customized services. While in the past were followed a branding line extension strategy (by introducing additional products and services for each service under the airline brand), modern airlines are keen to adapt a brand extension strategy even an co-branding approach, by using their own brand or promote co-operation for services offered by world class suppliers. Therefore, a corporation with a famous food and beverage firm to provide on board meals are beneficial for both. On the other hand, fleet management, business intelligence and strategic alliances or bilateral corporations are the core of the modern airline and impact on branding (Figure 2).

The wide-ranging changes of the aviation market impact on the airport business environment as well. While airlines are change pioneer, airports also are following an essential transformation from a typical state authority of '90s accommodate air traffic to a private oriented company using the benefits of high passenger's and activities concentration in their territory, shifting airports not just as transportation hubs but also as large commercial centers and technological innovation units. While commercialization and privatization of airports are a continuing tendency around the word, supported by long-term investments and international cooperation's, these long-term life cycle arrangements boost outsourcing arrangements at airports towards operational efficiency, corporate performance, and socioeconomic effects in local economy, [1, 2].

The outsourcing strategy for airports dealing more to control working capital cost and provide low aeronautical charges to their clients that are airlines. On the other hand, the non-aeronautical business unities are key drivers for revenues at airports. Therefore, airport operators transformed to more commercialized entities, there is plenty room for more outsourcing in terminal and land side activities. The modern airport terminal is closer to a large shopping mall, while many logistics, commercial and technological centers are spatially located at airports landside area. Therefore, airport revenues strategy encouraging business competition into non-aeronautical business and tend to reduce the barriers to entry in aeronautical business sections, [4, 6] (Figure 3).

Furthermore, the innovation in air transport sector also including the development of drones and airspace services, are growing fast. Up to now, for commercial activities the drone enterprises provide dedicated services as alternatives of traditional transport modes. Drones enterprises acting mainly as transport service providers are taken full responsibility of the transport chain. However, it's a very

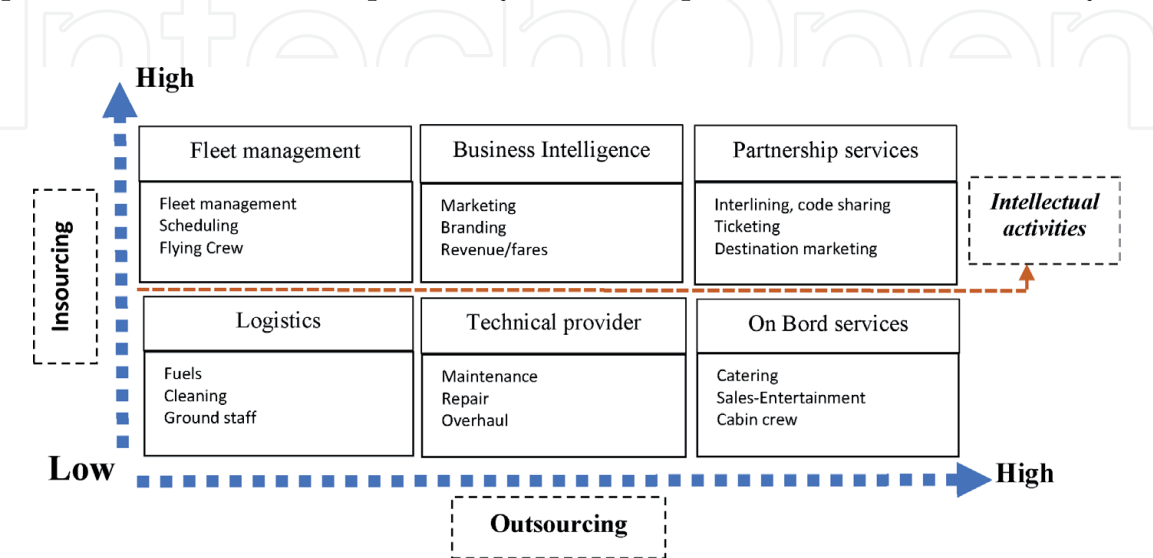


Figure 2.
Outsourcing functions for a typical international air carrier.

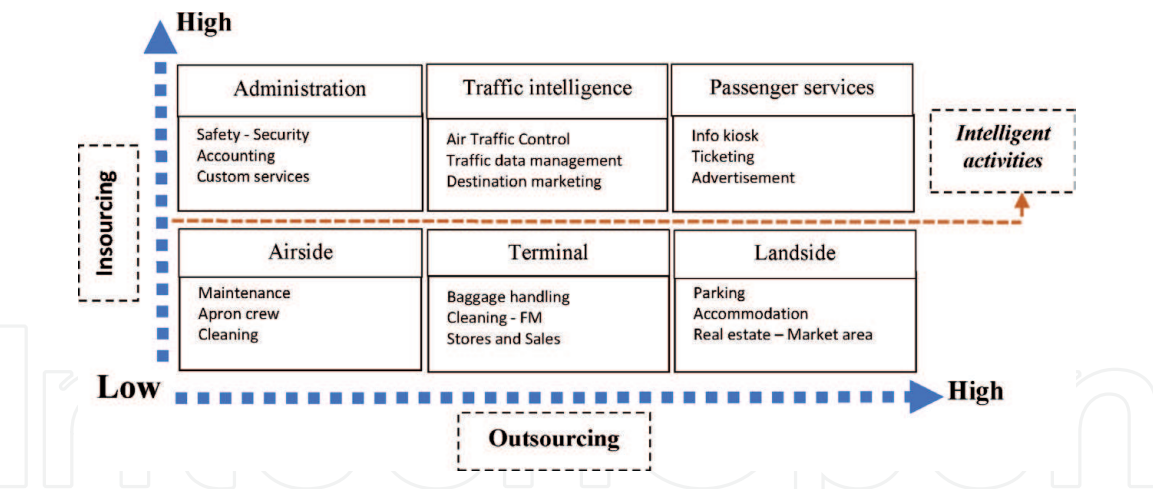


Figure 3.
Outsourcing functions for a typical international airport.

promising activity with a strong tendency to offer massive services, in urban networks (taxis, urban logistics, etc) and interurban distribution channels (remote destinations, islands etc) where other options are limited.

5. Outsourcing ground rules for transport sector managers

The operational environment in distribution channels is changing fast. The operations of a large transport company could be optimized in weeks by comparing its performance data having access to the competition and supplier’s data are uploaded in a database. In contrary, examples of extensive outsourcing of high-value functions are, for now, few and far between, with aviation and shipping be the pioneer sectors. In transport and logistics there is more room for outsourcing based on the market dynamics.

While considerable opportunities exist, transport enterprises need to prepare carefully and take into consideration a variety of strategic, business, operational and legal issues as well the key values of shareholders should be assessed towards deciding what functions or parts of function be beneficial to outsource. The key initials should be reviewed are:

- How to maintain flexibility when outsourcing a particular function or service that may change over the business life-cycle;
- For the high value functions the risk mitigation for smart source or niche-outsource should be carefully assessed;
- Compatibility with existing strategic alliances and partnerships should be analyzed;
- How to protect and manage the business sensitive data across competition and a tendency for outsourcing AI and IoT tools and applications and control the use of such data by third parties.

The key challenges for transport enterprise managers in a fast-changing industry and into the existing regulatory framework are highlighted in the following paragraphs.

5.1 Data control

Companies need to guard against outsourcing arrangements or partnerships that prevent them from adopting new technologies or contracting with new vendors. Data management is a great value for a transport enterprise so it's a of great importance to control data produced by its activity. Those with the biggest and best databases will be those with the best models and predictive power, able to outcompete others. Giving away data increases dependency on suppliers increasing company value at risk. Hence, the data management system architecture so they can change with the times as new and unforeseen options emerge. Any outsourcing arrangement must be structured in a way that enables the architecture to be flexible, compatible, and open oriented. Key success factor for pioneers is the developed data driven business intelligent tools to help build outsourcing services, tools that are sold to competitors. Deep consideration should be given in conflict of interest, non-disclosure agreements, intellectual properties, and information shared procedures, as mentioned in above section.

5.2 Outsourcing condition of contracts should be flexible and incentive

Both parties must share benefits and depending on nature of outsource service to share risks as well. Therefore, incentives should be the core of the collaboration frame and the outputs should be quantitated, determined, and monitored. Conventional wisdom is to agree in suitable incentives for an outsourcing arrangement to succeed. The usual ones—sharing gains and rewarding outcomes rather than inputs— are not extremely attractive in a digital age. But where outcomes are concerned, flexibility will be required. Eventually, it might be better to use another supplier to maintain competitive tension rather than to run existing outsourcing form of contacts. In business intelligence, hence, should avoid the deals that hinge on the use of proprietary or niche technology.

5.3 Risk control and assess value at risk

The risks of outsourcing to a single, dominant supplier might not be obvious initially, as digitization reduces the barriers to entry, prompting a proliferation of new players, all rushing to capture value and competing strongly. The risk of losing leverage over a supplier through a lack of credible competition is therefore significant. In addition, becoming too entrenched with a single supplier can make switching costs high, as many companies have found with enterprise-resource-planning systems. To help maintain a healthy level of competition, large companies spread even the same function of an activity among several suppliers and nurture smaller ones, although this does not come without a cost either. In a provocative sense, even the outsourcing for a large network in a city or region to a single supplier may the risks are significant lower to choose two or more suppliers to commit competition.

5.4 Negotiating outsourcing contract

When negotiating, both suppliers and transport enterprises should consider clauses providing for asset substitution, upgrading, and modification, intellectual property and know-how issues along with adjustments in pricing and penalties. A clear “objective” for both parties along with clear and dedicate benefits-risk sharing mechanisms to maintain technological change should be considered.

6. Concluding remarks

In transport sector, outsourcing can be extremely beneficial, productive even crucial to capture the potential of new technologies and innovation capabilities. Decisions to outsource for some companies' might base on buy time to build their own skills and capabilities or gain cooperation with technological driver of innovation, while smaller ones might outsource to leverage the capabilities of new suppliers. Ultimately, when up against increasingly smart and capable suppliers, many companies might have to rethink their core business. But in the meantime, they need to be highly strategic in their decisions about what or how to outsource.

With time, technology will undoubtedly break up the traditional value chain in the transport business ecosystem as companies are forced to conclude they enjoy a competitive advantage in far fewer functions than they do today. Eventually, they might be able to outsource entire parts of their business or major factions impact essential their value chain. Transport enterprises have to take the benefits of artificial intelligence and business intelligence as well. The outsourcing of research and development activities, especially, in the data management is on the top of the agenda even for the large companies.

The future impact of technology remains far too unclear. Very few years ago, for example, few businesses knew how important cloud data management would become. Open technology standards will be key to maintaining future strategic options towards outsourcing data retrieve services. While support might be sought for the execution of a technology strategy, decisions about what data to keep, where to store and process them, and how applications can access and manipulate them need to be made by the company. What companies should follow to ensure the capture of the short-term gains that outsourcing can deliver in a way that does not limit their future strategic options.

The paper outputs depict the results of a functional analysis for the transport enterprises, driven from the research outputs of ENIRISST program where transport intelligent application taken into consideration. The paper outputs given according to a System of System approach providing the changes on transport sector towards outsourcing and co-branding strategy. An area of further research could be this analysis to be extended for each sector of transport industry and to provide results in term of enterprise size, sector and market segment.

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