The new airport of Lisbon: a strategic framework

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Abstract

The aim of this paper is to provide a strategic framework for the new airport of Lisbon (NAL). By combining concepts of airport strategy with the practical example of Dubai airport, a strategy for the new airport of Lisbon (NAL) was laid-out. The strategy is to design the new airport of Lisbon (NAL) as a hub for the Europe-South America and Europe-Africa market, based on a "push" strategy. It has been researched how an airport with ambitious goals and a clear strategy that takes advantage of the resources available, is able to "push" demand, against all forecasting. The airport "builds" its own demand, instead of being "built" to the demand. Some competitive advantage items that may enable NAL to be a successful hub are exposed.

Keywords

Airport strategy, Lisbon Portela Airport, Push vs. Pull

1 Introduction

Lisbon Airport (IATA: LIS, ICAO: LPPT) also known as Airport of Portela, is located in the centre of the city of Lisbon and it is the main international gateway to Portugal. During the 30's, transatlantic flights were performed by seaplanes, therefore, the Portuguese government sought to build a transatlantic hub made of a maritime airport and a land airport located 3km away. Passengers arriving from overseas, disembarked from seaplanes and where transferred to the land airport to continue their journey to other destinations. Therefore, the Lisbon's airport was open in 1942 with four 1000m runways. It continued to grow and adapt to the trends on aviation, and in 2007 it handled about 13 million passengers and 80 000 tonnes of cargo per year, with 2 runways of 2400m and 3600m (ANA, 2008).

In 1969, the Portuguese government studied the construction of a new airport outside the city limits, predicting the impossibility to expand the current airport, which had become surrounded by the urban landscape. Since then, the project for a new airport has been left aside, and the airport underwent expansion of terminals to accommodate the increasing number of passengers. This expansion will continue until year 2017, when it will reach full saturation. In the early 90s public discussion about the construction of a new airport was intensified and was concentrated in choosing the best location for it. Portugal is a country of contrasts, therefore several hypotheses for the new airport were discussed, like the ones that defended the fact of keeping the current airport in the city and build a new low-cost airport away from the city limits. Still, the two mainstreams of opinions, focused on deactivation of the current airport, but they were divergent on the location. Lisbon is on the north bank of the Tagus river, which as a width between 1600m up to 10 000m upstream near Lisbon's city limits. One location proposed was to build the airport 50km north of Lisbon and the other was in the other bank of the river (south).

The discussion continued and became stronger due several variables and political interests, such as:

- Keeping an airport in the city center, serves the interests of some, e.g turism and the fact that Lisbon's city concentrates 2 million inhabitants, aprox. 1/5 of Portugal's population.
- The choice of on which bank the new airport would stay is very delicate since it has to coincide with future road and rail projects, such as the recently build 17km long bridge in the Tagus river that cost 900 million euros; the high speed train combined project to connect Spain and Portugal projected for 2015 with total cost of 8 000 million euros (RAVE, 2008); The location for the projected 3rd bridge over the Tagus river, that requires to be one of the world's largest suspended bridge (Gonçalves, 2007).
- The southern bank location has higher impacts for the environment yet the area allows all kind of future expansion (flat and deserted landscape), there is no need for terrain expropriation since it belongs to the government, therefore the total cost of construction is largely reduced.
- The northern location is in the core of a well developed Portuguese region (in commerce, tourism and industry) but investment required would be double as the one required on the southern bank: area has several morphological threats to air traffic and it is covered by rivers and pawns, therefore it would require the

movement of 50 million cubic meters of land to stabilize the terrain and to remove a cluttering hill in the landscape, which is equivalent to the construction of six English Channels (Parsons FCG, 2007). Moreover, due to space problems the airport could only be of ICAO category II with limited future expansion options. (R. Moreira, 2007).

- The efficiency of road connections to the large maritime ports located in the southern bank

In 2005, the Portuguese government announced the launch of the new airport in the northern location without considering other options for establishing the new airport. The academic community as well as public opinion raged in fierce discussion against it, since the southern location had proved to be the best from the several studies made since 1969. The government backed up in 2008 after a deep comparative study performed by LNEC (Laboratório Nacional de Engenharia: public research institution of science and technology) which gave reason to those that supported the thesis that the best location was the one on the southern bank.

The new Lisbon's airport is expected to be ready in 2017. The Master Plan is dated from 2002 and was elaborated by Parsons FCG and it is designed for the location that was not chosen. The master plan for the new location has not yet been presented. During the fierce discussion on the location of the new airport, the main issue has been left aside, meaning there is no public announcement for the strategy of the new airport. While the discussion of the location for the new airport kept on busying government, economists, academics, there wasn't a single mention of what kind of airport should be built and what are its long-term objectives or market positioning. The general feeling is that the new airport is built to cope with the expansion restrains of the current airport, disregarding importance of such infrastructure in the competiveness of national economy.

The new airport will give Portugal the change to decrease its economical and logistical dependencies of Spain. Without a clear strategy for the new airport, this opportunity will be overshot and may restrain for several decades the attempts for effective economical restructuring that would allow Portugal to face the challenges imposed by the European common marketplace.

Therefore, the purpose of this paper is to provide a strategic option for the market position of the new Lisbon airport by analysing its competitive advantages that may highlight the right place in the market, similarly to what other international players have done.

In Section 2, the methodology that has been applied is explained. Section 3 discusses the sources of airport's competitive advantage, followed by a discussion on the existent concepts of airports strategy. Section 4 analyses the success of Dubai airport. Section 5 finally summarizes the strategic framework to be used by NAL at a conceptual level and a strategy for NAL's market placement is revealed and explained. Section 6 is made up of the Conclusions.

2 Methodology

To achieve the objective proposed by this paper, the following steps are taken:

- Determine the sources of airports' competitive advantage (section 3.1)
- Find the right strategic framework suitable for the new airport of Lisbon (NAL) (section 3.2).
- Analyse the example of other airports that successfully applied the strategic framework (section 4).
- Analyse the NAL's competitive advantages accordingly to the previous findings and provide a strategic market placement for it (sections 5.1, 5.2).

3 Strategic Framework

3.1 Sources of competitive advantage

Park (2003) used Porter's (1980) Five Forces analysis (that determines the competitive intensity and therefore attractiveness of a market) to determine the "five core factors" that affect airports' competitiveness. As Figure 1 shows, cargo and passenger activities of airports are dependant of 5 factors:

- *Spatial*: The level of regional development around the airport, such as international trade zones, logistics and convention centers, aviation-related industrial complexes and other facilities.
- *Facility*: The level of airport facilities and expandability of facilities at existing airports to increase capacity.
- *Demand*: The level of origin–destination (O–D) demand and that of transit and transfer traffic volumes for hub-and-spoke network development.
- *Service*: Consists of the levels of service to users, types of airport operations, and levels of charges.
- *Managerial*: Economical considerations such as airport operating cost, productivity, and revenue structure.

Figure 1: 5 factors that affect airports' competitiveness. Source: Park (2003)

Literature that provides a primordial road map of strategic options, that use these 5 factors of competiveness on the first stage of airport conception, is very scarce. Most of the literature focuses on master planning, meaning, focusing on the design of the airport itself that is posterior to the layout of the high-level strategy that sets the long-term objectives and configuration of desired airport type. A good example of literature focused on airport master planning is Kazda & Caves (2007). Graham A. (2003) however, focuses on some of the managerial factors that influence airport performance. Still, both refer to a short-term or present tense, when the airports' master plan is being designed or when there is a need to align current airport operations (existent airports) with shifting long-term objectives so that they do not loose competiveness. Only Neufville & Odoni (2003) describe a strategic framework, primordial to master planning that is able to provide guidelines to develop the long-term objectives and vision in the first place. Neufville & Odoni (2003) call it "Dynamic Strategic planning".

3.2 Dynamic Strategic Planning

The master planning process is inherently "reactive". It represents one prospective response to one specific expectation about what may happen and assumes that the demand forecast is unalterable (Neufville & Odoni, 2003). Master plans are defined by the demand forecast that is set by many well known econometric models. For instance, gravity models were the earliest causal models developed for traffic forecasting (Grosche et al., 2007). The gravitational law states that the gravity between two objects is directly proportional to their masses and inversely proportional to their squared distances. Therefore the gravity models use this principle combined with other geo-economic parameters to estimate the attraction (passenger demand) of a route or even for the whole airport. For instance, Grosche et al. (2007) explain a basic gravity model (of demand forecast) for a certain route as follows:

$$V_{ij} = e^{\varepsilon} P_{ij}^{\pi} C_{ij}^{\chi} B_{ij}^{\beta} G_{ij}^{\gamma} D_{ij}^{\delta} T_{ij}^{\tau},$$

where Vij is total passenger volume between cities i and j which are dependent of the variables: Population, Catchment area covering the vicinity of an airport, Buying power index, Gross domestic product, Geographical distance, Average Travel Time.

As it is noticed, most of demand forecasting models are based on current geo-economic situation of the areas around the airport, like the population or catchment area. However, Dubai Airport handled 34 million passengers in 2007 and has a total population of 2.2 million. Neufville & Odoni (2003) also mention the success example of Orlando Internationl Airport, that from 1998 to 2000, was able to built traffic from virtually none to 1.2 million passengers (of whom about 1 million were international), through a careful strategy of partnering with holiday tours and charter carriers. These examples are the result of the fact that their planning shaped the future rather than responded to it (Neufville & Odoni, 2003). No forecasting model would predict or encourage these events. Therefore the Neufville & Odoni (2003) concept of dynamic strategy planning assumes that "forecasts are always wrong".

When planning an airport, managers have to be "proactive" instead of "reactive". "Airport operators need to think ahead many moves, establish a position that enables them to respond to threats and opportunities from any direction, and execute the

development of their airport properties move by move, year by year, accordingly to the actual events. Dynamic strategic planning "recognizes future uncertainties and leads to a flexible development strategy that positions airports to minimize risks and take advantage of opportunities". Therefore, the airport planning (or the posterior master plan) must be flexible to cope with future uncertainties, in order not to shackle the airport flexibility right from the beginning. This is as far as Neufville & Odoni (2003) go with their dynamic strategic planning concept.

The authors of this paper suggest an even bolder approach, where the passenger demand of an airport is no more a *pull* system, but a *push* system. With the right strategic choices that shape the airport type prior to its master plan development, it is possible to control and *push* demand if there is a will to introduce the services, facilities and operational efficiency required to meet the objectives necessary to push demand. Therefore, the demand is created by placing the airport with the right set of attributes (geographical, facilities, services and pricing) in the right market space. This is of course, performed on a daily-basis by most airports in the world when they *push* a passenger by consumer or business marketing (towards airlines), but the concept goes beyond that. In countries (or areas) that have all the forecasting models against their demand growth (due to low GDP, population, etc), it is possible to place the product (airport) to push passengers, instead of relying the actual geo-economical situation and build an airport adequate to the current situation.

This combined concept of "dynamic strategic planning" and "*push* strategy" is what the new airport of Lisbon (NAL) requires. First of all, currently there is no clear strategy (at least not publicly announced) that places the airport in a competitive position on the market; secondly, Portugal is not able to attract demand that can make it compete with other European players, by means of any forecasting model (due to GDP, population, buying power, and other economical indicators); thirdly, the master plan developed by Parsons FCG (for the old location chosen in 2002) is deeply "built-to-fit" the demand forecasting, that is calculated based on previous years (a completely different environment where the main actor is the current restrained airport), moreover, it shows not to have a strong flexible design and it is not able to anticipate future moves (like the New Large Aircraft issue), which goes against to most of the Neufville & Odoni (2003) recommendations.

In the NAL's master plan of 2002, the results of passenger forecasting up to year 2035 are basically a follow-up of current demand trends and commercial aviation's projected evolution, as Figure 2 shows. For instance, the number of connection passengers is a flat line, which is a mirror reflex of the situation at the current airport (mainly point-to-point city airport). If the decision is made to design the NAL to be hub of some kind, it seems safe to assume that the demand of connections will increase by the airport's placement in the market (if successful). However, with this approach, the airport is being designed to meet the forecasted demand and not the other way around, which is totally against to a "proactive" attitude.

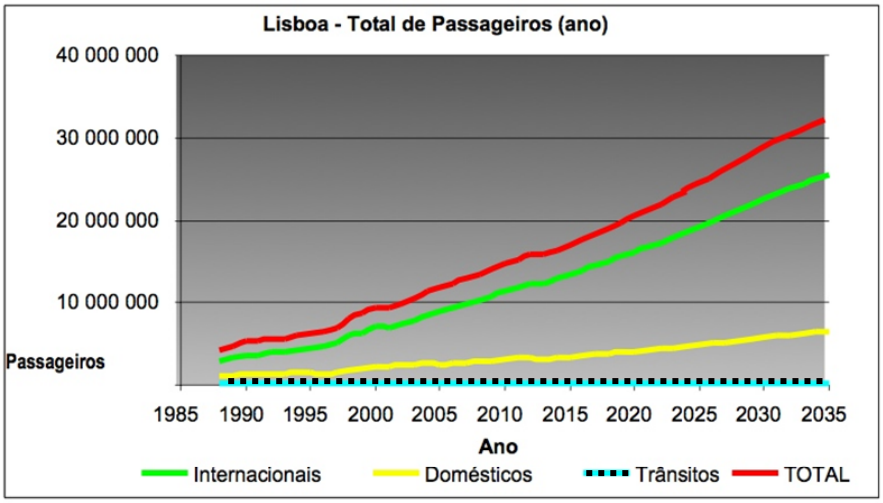

Figure 2: Passenger forecasting of Lisbon airport: Green = International, Yellow = domestic, Blue (dashed) = connection, Red = total passengers. Source: Parsons FCG (2002)

Moreover, there are some issues that are not addressed in the above mentioned Master Plan dated 2002.

The New Large Aircraft issue "is deferred for the following 4 years" (until 2006) is not present in the Master Plan. The issues related to the effects of New Large Aircraft operations on the airport airside are basically a matter of airspace and airfield geometry and how it impacts system capacity. The configuration and operational rules of the surrounding airspace, the size and separation of taxiways, runways and aprons, and the structural design of the airfield pavement, terminal configuration will be affected by the larger physical dimensions of the New Large Aircraft (Barros & Wirasinghe, 2002). Hence the need to address this issue carefully to avoid waste on investment and pre-allocating resources to anticipate the operation of new large aircrafts. The new large aircraft operations is also deeply related to the type of airport that is going to be built, since large aircraft operations is deeply related to hub-and-spoke systems, therefore not considering this issue demonstrates a lack of overall strategy of market position and lack of positioning on the type of service that airport will focus on.

To fully develop the strategic framework, following what has been explained about "dynamic strategic planning" and "*push* strategy", it is important to first analyse an airport that is example of success in applying these two concepts during their planning and growth.

4 Example of an airports successfully "*pushed*"

Since the 1970s, the Middle Eastern governments have been focussing on the aviation industry as a measure to diversify their industry to anticipate the future decline in revenues from the petroleum industry. These governments understand that investment on their commercial aviation infrastructure is necessary to achieve their long-term vision of turning the region into a global centre for commerce and trade (Vespermanna et al., 2008). Dubai, as part of the United Arab Emirates is a perfect

example of what is really happening. The population in Dubai rounds 2.2 million, yet its Airport handled 34.34 million passengers in year 2007.

As figure 3 shows, the evolution of the number passengers of Dubai airport is incredible. In less than 10 years, the number of passenger raised from 9.1 million passenger in 1997 to 34.34 million passengers in 2007. With advertised expansion work in progress, the airport plans to have a capacity of 70 million passengers over the second decade of the XXI century.

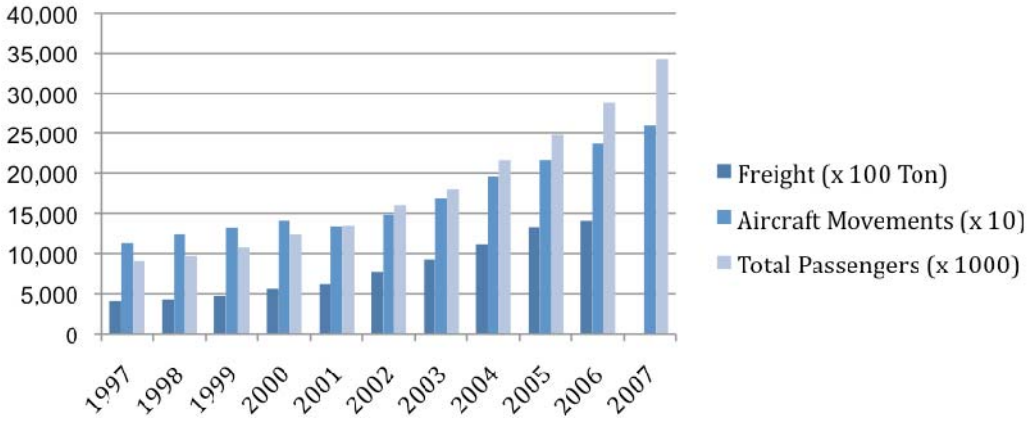

Figure 3: Evolution of handled passengers by Dubai Airport. Based on data from Dubai Airport public stats

The airlines in Dubai are following the same trend as its airport. Emirate Airlines (based in Dubai), show remarkable growth of passengers and revenues between 2002 and 2008, as illustrated by Figure 4. The number of passengers increased from 8.5 million in 2002 to 21.2 million in 2008. Emirate Airlines serves over 20 cities in Europe and plans to connect Dubai to over 100 cities around the world by 2012. Moreover, Emirate Airlines plans to more than double its all-wide-body fleet capacity by 2012 (a total fleet of 200 aircraft) between the several optioned and ordered aircraft in the recent years. (Emirates Group, 2008).

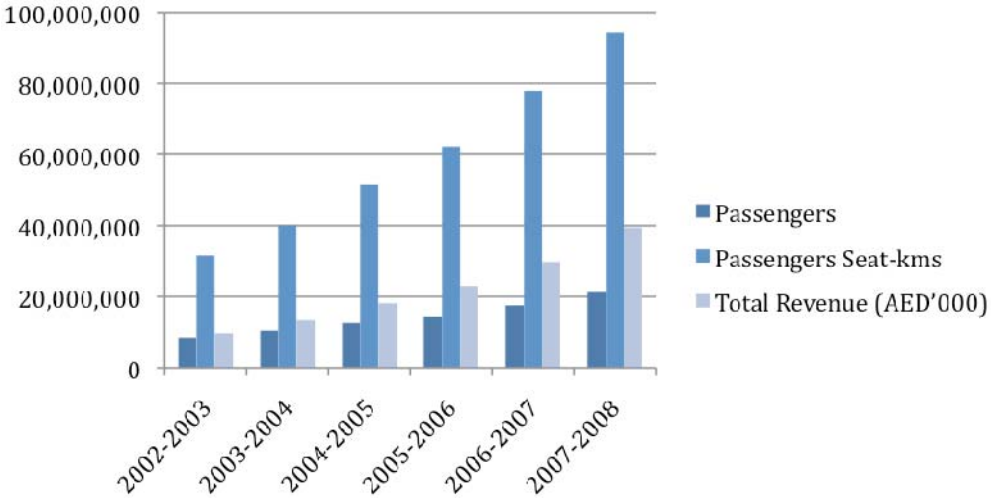

Figure 4: Operational Results of Emirate Airlines. Based on data from Emirate Group public stats

Vespermanna et al. (2008) analysed the potential growth in aviation in the Middle East. The conclusions of their study are as follows:

- Domestic demand in the Middle East is not sufficient to provide so many passengers, due to economic restrictions (estimated proportion of 20% to 45% of the population living below the poverty line) and overlapping catchment areas. The United Arab Emirates, Bahrain and Qatar have a combined 5.5 million people.
- There is a large growth in tourism as a result of high investments on this sector. International tourism arrivals in the Middle East reached about 38 million in 2005. The Middle East is the second fastest growing region in the world for inbound tourism.
- The cost structure of Middle East airports results into lower operating costs, allowing the airlines to be competitive on prices. Therefore, airlines are expanding their routes and penetrating into markets that belonged to Asian (e.g. Singapore, Malaysia) and European players (European major hubs like Frankfurt Airport). Through their competiveness, Middle East airlines are filling capacity on connecting passengers from Europe to Asia, therefore filling their airports capacity with these passengers, as a synchronized synergy between airports and airlines.

Moreover, Vespermanna et al. (2008) points out an interesting cost breakdown comparison between European carriers and Middle East carriers. As illustrated in Figure 5, Middle East carriers have lower costs in all most important items of the total operational costs, allowing them to be more competitive than European carriers. Vespermanna et al. (2008) also studied the total travel time of the Europe-Asia market, and points out that the travel time can double when flying on a Middle East carrier, therefore, he presents this fact has one of their weaknesses in catching the business/frequent passenger's segment.

Cost	Kerosene	Fees	Personnel	Fleet	Station	Sales	Catering
Share of total cost[1]	23%	12%	32%	15%	10%	5%	3%
Cost difference of Middle Eastern Carriers[2]	-20%	-39%	-48%	-20%	-25%	20%	-5%

[1]Typical allocation for Network-Carriers with high share of long-distance routes
[2]Analysis based on: O'Connell (2006), ADL-Research (2007), own research

Figure 5: Cost comparison EU-Carrier vs. Middle-East-Carrier. Source: Vespermanna et al. (2008)

Now that there is a starting point to elaborate the strategic framework and some lessons are understood from practice, it is possible to lay out the strategy for the NAL.

5 NAL strategy

5.1 Framework

Before proposing a strategy for the NAL, it is necessary to clarify and finish the framework where the strategy will be based upon.

Park (2003) explained that sources of competitive advantage (as shown in the previous section) of an airport are due to 5 factors: Spatial, Facility, Demand, Service, Managerial. However, when using the dynamic strategic planning concept of Neufville & Odoni (2003), combined with a *push* strategy like the one found on the Airport of Dubai, Park's (2003) sources of competitive advantage are thrown to a later stage, more like a by-product of an early stage of concrete strategy that will *push* the airport into the market, and therefore *pushing* demand rather than respond to it (*pull-system*). The same happens with the sources of competitive advantage, as they become the "result", instead of "sources". First, there must be a focus on the current resources, then the commonly used term "strategy" sets what the airport must do with these resources, leading to the competitive advantage, like perpetrated by the management theories of Resource-Based-View and Dynamic Capabilities. Resource-based view (RBV) determines the strategic resources available to a firm. The fundamental principle of the RBV is that the basis for a competitive advantage of a firm lies primarily in the application of the bundle of valuable resources at the firm's disposal (Wernerfelt, 1984). Yet, having all the resources is not enough to build competitive advantage, there must be a clear strategy on how to use them (dynamic capabilities) (Teece et al. (1997)). Resources in this case, are not just internally controllable by the airport itself, they can also be external and uncontrollable like the geo-economical environment where the airport is located. Moreover, resources are not absolute, they can also refer to some kind of added value relative to a competitor's same resource. Figure 6, summarizes the strategic framework described in this section.

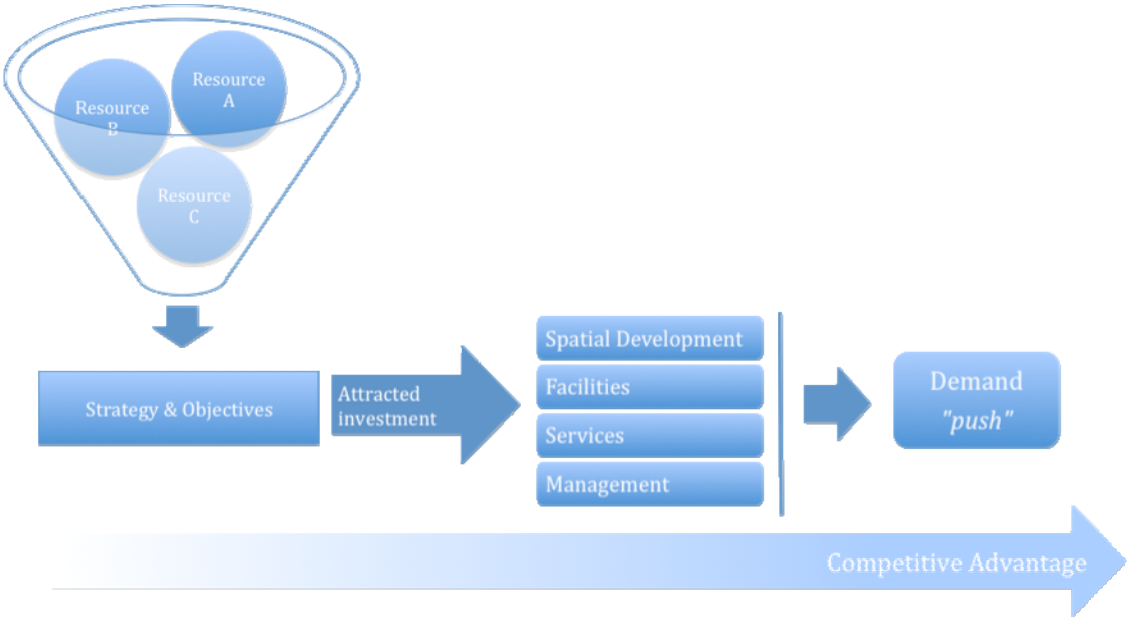

Figure 6: Final concept of Strategic framework

If there is a clear strategy and motivation to place the airport in the market in some way, the airport will develop (*push*) the necessary items of competitive advantage by itself, e.g: develop adequate facilities, promoting the attractiveness of the area around the airport, choosing the managers that are aligned with the airport's long-term objectives, etc.

If such a clear strategy (or vision) exists it will be able to attract more private investment, both from the airside and landside, as the feeling of having a common goal and synergy building towards the same objective pleases the ones that operate on and around the airport as well as investors. Like in Dubai Airport's example, the success is only possible if there is a synergy between the airport and based airlines, somewhat to what is verified in Europe's greatest hubs, e.g. the synergy between Schiphol (Amsterdam Airport) and KLM. This notion goes further than that, the airport must not rely solely on existent based carriers, since it is risky to lean on such volatile companies (airlines), specially, in the case of NAL, TAP Portugal's future is still uncertain due to upcoming privatization. The strategy must also include means to foment the consolidation of smaller Portuguese based airlines and the investment on new airlines. For instance, most of the touristic routes are served by low-cost carriers like Easyjet or Ryanair[1] because the Portuguese tourism[2] is able to efficiently attract the British and German tourist markets and there is no reason why this segment is not well served by Portuguese based carriers instead, since Portuguese carriers can be a lot more competitive in important cost items like labour costs (that represent high share of the airline's costs, see Vespermanna et al. (2008)).

As soon as the airport places itself in the market and remains one step ahead (controlled risk) *pushing* demand, private investment will follow and due to the *spin-off effect* it will feed and strengthen the foundations of the airport to take another step forward to reach the proposed objectives. It seems risky to *push* an airport (product) in this way, but the current demand (the one that is always exists due to the current need of travel) is able to support the airport (*pull*-system) while endeavouring one step further, similar to what happens when an airport faces the decision of expansion, the steps taken towards expansion must be of small increments so that if there is a recession on demand, the airport is still able to support itself on the current demand: the essential basis of any master planning (flexibility) as proposed by Neufville & Odoni.

In the next paragraph, the authors propose a strategy for the NAL based on the strategic framework and mentions the possible resources that the NAL may have, however, the remaining items mentioned on the strategic framework are out of the scope of this paper.

5.2 A Europe-Africa and Europe-South America Hub

The authors propose that the NAL strategy is to position itself as Europe-South America and Europe-Africa (sub-Saharan Africa) Hub, through a multi-hub system with nodes in Brazil and Angola as shown in Figure 7. The following elaborates on this strategy, followed by a detailed discussion about the two primary resources (labour costs and geographical distance) on which the strategy is based.

[1] Ryanair carried 1.3 million passengers in 2006 on their routes from Faro and Oporto. (Ryanair, 2007). Easyjet carried 93,500 passengers in the first 6 months of operations from London to the recent "open-sky" of the Portuguese Atlantic Island, Madeira; 560,000 passengers on their routes to Lisbon between 2006 and 2007.

[2] Portugal is on the world's top 20 touristic destinations, with almost 12 million tourists in 2006 seeking Golf and luxury Beach Resorts (WTO, 2007).

Figure 7: Sketch of a multi-hub system from Europe to Africa and South America. Nod hubs in Brazil and Angola

Hub-and-spoke networks are more likely to be profit-maximizing if the value of flight frequency is high and the disutility of longer travel times and connecting is low. The demand uncertainty benefits a hub-and-spoke network, because it allows a reallocation of capacities after demand has been revealed (Wojahn, 2001). If the NAL is using a "push" strategy where the demand is uncertain or yet to be created, the NAL should strive to be a hub, in order to place itself at the same level of competition as other major players in Europe. The hub-and-spoke model has awarded several central-western Europe countries, 8 of them (including the neighbour Spain, with Madrid Barajas Airport) have hubs that keep on expanding, with growth in passengers from 30% to 60% between 1995-1999 (Dennis, 2001). Others, like the United Kingdom (Heathrow Airport) and Germany (Frankfurt) are congested due to growth on passengers. Portugal has to take the change not lose the opportunity to build a hub, instead of continuing with a point-to-point system that reveals to be less profitable than a hub system and which is unable to generate (push) demand as well as attract other investments for start-ups of service providers and airlines, or even for the growth of current operators. Hubs can play an important role attracting tourism, conferences, theme parks, and other important industrial and commercial activities (Martín, 2003).

However, with the European hub systems becoming more and a more competitive it is important to find the right place in the market where NAL could compete. There is an impression that attention is drawn to Asia (by Frankfurt, Schiphol, etc) or to the North American market (Heathrow). Madrid is probably the only airport that is revealing itself as an "hub for the Europe-South America" market, due to geographical location

(that shortens the time of travel) and due to historical relations and influence in some South American countries. Madrid-Buenos Aires where the city-pair with highest traffic on the South-American market in 2000 (Martín, 2000). As Vespermanna et al. (2008) demonstrates, major European hubs are already losing millions due to the higher competiveness of the Middle East airports in the Europe-Asia market. If the situation continues, the European Hubs will turn their focus to other markets in an obvious technique of survival. The Europe-South America and the Europe-Africa (sub-Saharan Africa) markets are yet to be fully explored, especially with recent fast growing economies in Africa like Angola (growing 2 digits a year after the civil war has end ended in 2002). NAL has the opportunity to venturing into these "unexplored" markets before facing severe competition around 2020 (by the time Middle East Airports expect to reach maturity) from some major European Hubs. An airport in Lisbon is unsuited to intra- European traffic but may be an optimal location for the Europe-South America market. (Dennis, 1994).

Portugal has strong historical relationship with Angola and Brazil that enable multi-hub system to work properly. Brazil was discovered and colonized by the Portuguese in the XVI century. Even after independence from Portuguese domain in 1822, the relationship has maintained, and now a days strong political, economical commitments and partnerships from both sides continue, way beyond the touristic context. Portugal has a 5th freedom of air agreement with Brazil, which is a first step to build alliances and partnerships required for an efficient multi-hub system. Moreover, TAP Portugal (flag carrier) has investments in Brazil; for instance, it owns Varig, a Brazilian airline. If we observe the map of routes of Star Alliance (which TAP belongs too), it is possible to visualize the present strong incidence of TAP on the markets of Brazil and Angola. Angola was a Portuguese colony from 16th century to 1975. The civil war in Angola ended in 2002 and with its stabilization; there is a visible rush of foreign investment to cease the opportunities that the country has to provide. Currently, Portuguese investors are taking the lead in investing in Angola, as there are also good incentives from the Portuguese government to continue to do so. In 2008, the Portuguese government approved a special credit system for the Portuguese investors that wish to invest or increase their investments in Angola. The majority of investments are on infrastructure development: communications and construction. Moreover, at glance, Angola seems to be a nearly optimal location, geographically speaking, to serve the Sub-Saharan market.

The political and economical situation of these two countries can be considered well aligned with the proposed strategy.

The resources (see Figure 6) of the NAL on which this strategy is based are **geographical distance** (flight routes), **lower labour costs**, and ultimately may lead to lower fares and lower operating costs for both airport and airlines. Vespermanna et al. (2008) points out that an operating cost structure favouring low fares and low cost of operations for the airlines, is the main reason for the success of the Airport of Dubai.

Geographical distance

NAL is located near the far west coast of Europe, which represents the shortening time of flight from South-American destinations compared to Madrid Barajas Airport. There is also the coordination with the High-speed trains routes to Spain, can also

increase the effect of geographic distance since they can easily feed NAL with Spanish passengers too.

Martín (2003) studied the optimal location for an Europe-South America hub, that minimizes airline's transportation costs, for one hub system and two hubs system. His findings are displayed in Figure 8 and Figure 9.

Hub airport candidate	Average distance		Distance penalty hub vs. direct service	
	km	% inc	km	%
Lisbon	9432	0	50	0.55
Tenerife	9501	0.72	119	1.29
Gran Canaria	9503	0.75	121	1.32
Porto	9508	0.80	126	1.37
Madrid	9540	1.14	158	1.71
Recife	9986	5.87	604	6.56
Salvador	10,050	6.54	668	7.25
Paris	10,376	10.00	994	10.79
Rio de Janeiro	10,408	10.34	1.026	11.14
Sao Paulo	10,477	11.07	1.095	11.89
London	10,524	11.57	1.142	12.40
Brussels	10,715	13.60	1.333	14.47
Zürich	10,803	14.53	1.421	15.43
Amsterdam	10,939	15.97	1.557	16.90
Frankfurt	10,972	16.32	1.590	17.27
Rome	11,115	17.84	1.733	18.82
Caracas	11,441	21.30	2.059	22.36
Bogota	12,249	29.86	2.867	31.13
Buenos Aires	12,588	33.45	3.206	34.81
Quito	12,947	37.26	3.565	38.71
Santiago	13,734	45.61	4.352	47.26

Figure 8: Candidates for optimal location of Europe-South America hub. One hub system

Hub airport candidates for airlines (two hub network)

Hub airport city-pairs candidates	Average distance covered by passenger		Distance penalty			
			Two hubs vs. direct service		Two hubs vs. one hub in Lisbon	
	km	% inc	km	%	km	%
Recife–Tenerife	9945	0	563	6.12	513	5.57
Recife–Gran Canaria	9960	0.15	578	6.28	528	5.73
Recife–Lisbon	10,024	0.79	642	6.97	592	6.43
Salvador–Gran Canaria	10,054	1.09	672	7.29	622	6.75
Salvador–Lisbon	10,089	1.44	707	7.67	657	7.13
Salvador–Tenerife	10,090	1.46	708	7.69	657	7.15
Recife–Madrid	10,093	1.48	711	7.72	661	7.18
Recife–Porto	10,134	1.90	752	8.17	702	7.63
Salvador–Madrid	10,163	2.19	781	8.48	731	7.93
Salvador–Porto	10,173	2.29	791	8.59	741	8.05
Rio–Tenerife	10,373	4.30	991	10.76	941	10.22
Rio–Gran Canaria	10,409	4.66	1027	11.15	977	10.61
Rio–Lisbon	10,446	5.03	1064	11.55	1014	11.01
Sao Paulo–Gran Canaria	10,481	5.39	1099	11.94	1049	11.39
Sao Paulo–Lisbon	10,510	5.68	1128	12.25	1078	11.71
Sao Paulo–Tenerife	10,513	5.71	1131	12.29	1081	11.74
Rio–Madrid	10,516	5.74	1134	12.31	1084	11.77
Rio–Porto	10,554	6.12	1172	12.73	1122	12.18
Sao Paulo–Madrid	10,591	6.49	1209	13.13	1159	12.59
Sao Paulo–Porto	10,612	6.71	1230	13.36	1180	12.82

Figure 9: Candidates for optimal location of Europe-South America hub. Two hub system

Tenerife and Gran Canaria locations have no importance and may be disregarded, since they are small Atlantic islands. Lisbon presents itself as the best place to have an Europe-South America hub, with Porto in second place, in a one-hub system, beating by far all the European (continental) locations, with a distance penalty compared to direct service to be negligible. In a two hub system, Recife (Brazil) – Lisbon are the best place to implement it, therefore, strongly supporting the proposed strategy.

Lower labour Costs

As it is known, labour costs can take a large share on airport's cost structure. Portugal is the 3rd country in the European Union (25 countries) to have the lowest Total Labour Cost Index (TLCIT) in the Transport, Storage and Communication sector. Germany occupies the first place (TLCI = 111.2), followed by Austria (TLCI = 113.8) and Portugal (TLCI = 118.8). The TLCI average on European Union is 126.9 and Spain has TLCI = 128.2, which is above average on European Union (EuroStat, 2007). This factor can be a source of competitive advantage towards other prospective competitors, however it is only useful if the management is able to foment high employee productivity, something that is still hard to do in the current Portuguese industrial context.

6 Conclusions

The new Lisbon airport (NAL) clearly needs a strategy. Making the most out of the fact that the literature is scarce regarding new approaches for *strategy-making* of new airports, the authors believe that they were able to combine some existent concepts into a final strategic framework, that be successful if applied in similar contexts. The NAL can be a big airport if it strives to *push* demand, like others did, instead of just responding to it. The government (responsible for the NAL's decision-making, design and planning) should be aware that in fact it is possible to do so, even against classical demand forecasting. If there is an ambition to turn NAL into a profitable, well-positioned airport, instead of building just another air gateway to Lisbon/Portugal, there will be return on investment by "pushing" this ambition to other stakeholders. Only a very well tuned "choir" of all stakeholders (i.e. citizens, government, private companies, touristic entrepreneurs) will enable the success of an ambitious strategy for the NAL.

The strategy presented in this paper should not be interpreted as definite and complete since (first of all) it is not fully justified and validated. Still, it agrees with some wishes for the NAL strategy that are starting to be publicly whispered by some stakeholders, because some are able to see the resources at NAL's disposal to build competitive advantage over direct competitors. Only time will tell (first NAL operational results to be published around 2020) if there is a clear ambition to implement and take advantage of the resources available.

In this paper, the analysis should be more in depth, when justifying the placement of the new Lisbon's airport, as well as a more concrete study on how to effectively construct the multi-hub system: what alliances to develop, deep study on the competitor's weaknesses and NAL's strengths, etc. However, there was satisfactory focus on the conceptual framework to adopt when defining the airport, which is the most important step. Developing focus on further steps of implementation would

require more time and resources (information) that were not available by the closure of this paper. This is something that leaves space for the development of other papers and analyses that focus on these matters.

With regard to the theoretical framework (Figure 6) one element that especially deserves further research is the airport-airline relationship. The example of Dubai airport showed that the airline (Emirate Airlines) plays a significant role in the success of Dubai's "*push*" strategy. What the characteristics of this airport-airline relationship are and how important this relationship is within the proposed strategic framework is topic for further research. The importance of the growing tourist sector in the case of Dubai and how this relates to the *push*-strategy lain out for the NAL is also a topic for future studies. Finally, the possible negative effects (e.g. environmental) of the proposed *push*-strategy should be subject to further analysis as well.

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