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AIRNETH WORKSHOP REPORT

"Strategies of multi-hub airlines and the implications for national aviation policies"

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1. Introduction

1.1. Airneth is an initiative to support aviation policy in the Netherlands using the most recent insights from academic experts from various disciplines. In addition, Airneth has the objective to address important policy issues in the academic world.

1.2. Airneth uses several tools to achieve its goals. In workshops, seminars and via the interactive website, Airneth stimulates the exchange of knowledge between academics and policy makers in the field of air transport.

1.3. This report is based on the results of a workshop on multi-hub development on 28 October 2005 in The Hague, The Netherlands.

1.4. Participants of the workshop came from different academic, policy and industry backgrounds. Airneth has the objective to communicate the knowledge and different views of these participants to policy. Hence, the views expressed in this report are not necessarily those of Airneth. In addition, the report is the summary of (different) conclusions of the various participants of the workshop. Therefore, statements and views expressed can sometimes be contradictory. Views are not necessarily shared by all the participants.

2. Executive summary

2.1. The objective of the workshop “network strategies of multi-hub airlines and its implications for national aviation policies” was two-fold. Firstly, to gain insight into the most relevant insights with respect to multi-hub network development in the academic world. Secondly, to assess the consequences for policy-making with regard to the development of Schiphol and Paris as primary hub airports in the network of Air France-KLM.

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2.2. The prospect for Schiphol as a secondary intercontinental hub besides Paris Charles de Gaulle in the Air France-KLM network is a ‘no, but’ story.

2.3. From a network economic point of view, the use of a multi-hub system with hubs located in close proximity to each other is always more cost intensive than a single hub system due to the loss of density economies and the duplication of complexity costs. Given the larger OD market of Paris Charles de Gaulle and its larger network, Paris Charles de Gaulle is likely to be the preferred hub for Air France-KLM.

2.4. However, hub-bypassing, strategic positioning capacity restrictions at the principal hub, complexity costs of giga-hubs, bilateral restrictions and better aircraft utilisation may overcompensate the loss of density economies and the duplication of complexity costs. In such cases, a network with multiple hubs may be the preferred network configuration.

2.5. The policy options for national aviation policy and airport policy to stimulate or steer the development of Amsterdam Schiphol as a secondary hub are limited.

2.5.1. Hubs are a means to achieve network quality, not a goal in itself. Maintaining network quality at Amsterdam Schiphol should be the main objective.

2.5.2. Providing airport and airspace peak-hour capacity and reliability is the key-element for the growth of any hub, including Schiphol. A level playing field for Schiphol vis-à-vis Paris Charles de Gaulle and other hubs has to be guaranteed in order to ensure a fair starting position for Schiphol in the competitive struggle. One should be careful with the facilitation of low-cost airlines at a secondary hub such as Schiphol. Although low-cost carriers are beneficial to an airport in many ways, they could also ravage the relatively small OD market of a secondary hub and drive down the yields of the hub-carrier.

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2.5.3. The Netherlands could give seventh freedom rights to other major airlines if active hubbing at Amsterdam should decline. Seventh freedom rights may force the hub-carrier to develop the secondary hub to keep out competition. On the other hand, seventh freedom carriers may provide Schiphol with long-haul network quality.

2.5.4. If active hubbing by Air France-KLM should decline, having the option to develop low-cost carrier activities at the airport is important in order to ensure short-haul network quality.

3. Context and objectives of the workshop

3.1. Policy makers are faced with a more and more liberal political context, whereby a shift of responsibilities for bilateral negotiations to the EU takes place. The aviation industry is seeking for cooperation, alliances and even mergers and, in this way, is reorganizing its market structure. In these new market situations, rationalisation is taking place for example by combining route structures, resulting in multi-hub systems.

3.2. Because of the merger between Air France and KLM, planners and policymakers of DGTL, DGAC, the Schiphol Group and Aéroports de Paris are faced with a structural changing network context. The network configuration of the home-based carrier at Schiphol airport as well as Paris CDG is changing from an intercontinental single-hub network to a network with multiple hubs in close proximity to each other.

3.3. The merger creates opportunities but also threats regarding the future network development of the company, the network quality of Paris CDG and Schiphol airport.

3.4. The objectives of the workshop “network strategies of multi-hub airlines and its implications for national aviation policies” was two-fold. Firstly, to gain insight into the most relevant insights with respect to multi-hub network

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development in the academic world. Secondly, to assess the consequences for policy-making with regard to the development of Schiphol and Paris as primary hub airports in the network of Air France-KLM.

4. The failure of multi-hub networks

4.1. Hubs are not a goal in itself but a means to add value[1]. In general, hubs add value to an airline through beyond market access. Moreover, they average out natural peaking of demand, can generate rents (hub premiums, density and scope economies) and provide opportunities for mixing prices.

4.2. Primary hubs in a multi-hub system can be defined as hubs having (1) a major share in the traffic system of an airline and (2) being dominated by the hub-airline at the respective hub.

4.3. Consolidation in the US airline industry has shown that merged airlines close down duplicating hubs[2]. Networks with multiple hubs still exist in the US, but the hubs are geographically dispersed. This would also fit for a multi-hub network of a merged British Airways and Iberia with Heathrow and Madrid being the primary hubs. However, this would not fit for the Air France-KLM network with Amsterdam Schiphol and Paris Charles de Gaulle being the primary hubs.

4.4. The example of the de-hubbing of British Airways' secondary hub London Gatwick (besides London Heathrow) is an example of the failure of duplicating hubs in Europe. The Gatwick hub-strategy failed because of: 1) proximity of Heathrow and Gatwick, so local catchment areas are too similar; 2) Yields at Gatwick were lower than on Heathrow; 3) Long-haul routes could be made much more profitable by simply moving them to Heathrow; 4) It was costly to duplicate the short-haul feeder network from Gatwick; 5) runway capacity was insufficiently available at Gatwick to obtain critical mass of frequencies of network spread[3].

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4.5. Tertiary hubs such as Clermont-Ferrand (already de-hubbed) and Lyon are generally considered not to be viable solutions for the future. Low-cost competition, landside substitutes by rail and the growth in the use of corporate jets will further decrease the value of tertiary hubs. In addition, the evidence of the existence of economies of density in relation to short-haul network carriers remains scant[4]. Finally, these hubs will be targeted by airlines as Emirates and carriers in other (non-EU) regions.

4.6. The multi-hub network of Air France-KLM is unique: there are no examples of airlines with multiple hubs within a range of less than 500 km. Detroit-Minneapolis would be closest at 900 km[5].

4.7. Network economics tell us that multi-hub networks are not optimal. Multiple hubs are always more cost intensive due to the loss of density economies and the duplication of complexity costs[6].

5. **The rationale for airline networks with multiple hubs**. Is there a rationale for an airline to operate a multi-hub network?

5.1. *Natural development of airline networks is from skeletal to connected*. Early developments of networks build loads to use larger airplanes and reap aircraft economies[7]. The focus is on a few major hubs. However, later network developments bypass initial hubs. Bypassing saves the costs of connections and establishes secondary hubs. Frequency development outweighs density economies. Growth translates into frequency growth not capacity growth.

5.2. *Hub-bypassing*. Long-haul, direct services from non-hub airports can grab a major share of the premium market[8]. An example is the direct premium, dedicated service between Düsseldorf and New York. Hence, if additional revenues from direct services can overcompensate the additional costs of direct services, the profit maximising network configuration can take the shape of a multi-hub network. Yet, such a multi-hub like network does not

necessarily include hubbing activities (transfer process, wave-system structure) at the secondary long-haul node. Hence, the future of long-haul services from secondary airports such as Amsterdam, Rome FCO, Vienna, Copenhagen and Zurich is dependent on the degree of preference for direct flights and the size of the local high yield demand. High preference for direct flights will favour long-haul services. Low-demand will lead to the abolition of long-haul routes. Medium demand will lead to minor long-haul activities at secondary airports. Based on this line of argument, a reduction in long-haul services from secondary hubs can be expected. As demand grows, more long-haul services will be established at non-hubs.

5.3. *Strategic positioning*. Primary airports, in particular hub-airports, have monopoly power, which often leads to higher costs for the hub-airline. A secondary hub in the network gives the airline some bargaining power over visit costs, since both hubs are now in competition. The lower overall costs may overcompensate the loss of density economies in a multi-hub network. When the overall costs at both hubs are equal, the airline should follow a single-hub strategy, according to Jan-Cristoph Düdden from WHU Koblenz. Such a strategy may be complemented with long-haul connections from non-hub airports to serve specific local demand. In addition, secondary hubs may be developed by an airline to keep out competition.

5.4. *Insufficient capacity at principal hub*. Capacity shortages may force an airline to open a second hub (e.g. Lufthansa at Munich, BA at Gatwick) to accommodate general market growth[9]. Congestion at primary hubs drives the need for secondary hubs. There may be a need for three or four secondary hubs in Europe, besides the three or four primary hubs.

5.5. *Giga-hubs are vulnerable to congestion and disruption*[10]. Hubs are expensive due to complexity costs. Because of these complexity costs and low-cost carrier threat, some hubs moved to the rolling hub concept, by spreading out

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the waves and having less tightly integrated banks. This reduces costs through fewer factors such as labour and aircraft and reduces the amount of congestion generated by the hub-carrier itself. The value of connectivity has to be judged against the costs of complexity.

5.6. *Restrictions in bilateral air service agreements*. British Airways, for example, is not allowed to serve the partner hub Dallas Ft. Worth from London Heathrow because of bilateral restrictions. British Airways is forced to operate out of London Gatwick instead[11].

5.7. *Geographically dispersed markets*. Differing geographic flows may lead hubs to specialize in certain markets (e.g. Heathrow to North America, Madrid to Latin America)[12].

5.8. *Better aircraft utilisation*. The use of multiple hubs allows hub-airlines to schedule a departure of an aircraft from hub one and the return to hub two[13]. In a single-hub network some aircraft have to wait at the spoke airport to fit in the next arrival wave at the hub (because of the hub-repeat cycle). With two hubs, this problem can be (partly) avoided and aircraft utilization increased. This type of scheduling is often used in the US but not in Europe. However, because of the different branding of Air France and KLM, the use of KLM aircraft at Paris Charles de Gaulle and of Air France at Schiphol will be difficult from a customer perspective apart of the routes between The Netherlands and France.

5.9. *Aviation law*. From the perspective of aviation law, the ownership and control structure of Air France-KLM tries to reflect the commercial interests of the combined operations whereas at the same time the nationality clause in bilateral agreements are taken into consideration. As long as a Community clause is not included in all relevant bilateral agreements with non-EU states and the criterium of principle of place of business has not been accepted in

global air transport policy, EC member states, including therefore France and the Netherlands, must rely on such traditonal nationality clauses[14].

6. Future prospects for Amsterdam Schiphol and Paris CDG

6.1. Until 2008, the State Assurances between the Dutch state and Air France-KLM guarantee the direct service of 42 intercontinental key destinations by Air France-KLM from Amsterdam Schiphol. For another three years, Air France-KLM has committed to the equal and balanced development of the Amsterdam Schiphol and Paris Charles de Gaulle hubs. The Dutch State monitors if the network behaviour of Air France-KLM is in line with the State Assurances. Until now, the recent network development at Schiphol is stronger than the one at Paris CDG[15].

6.2. Local catchment area of Amsterdam Schiphol will always secure a certain number of non-exclusive, short-haul and long-haul connections[16].

6.3. Consolidation versus fragmentation: one giga-hub or multiple hubs[17]?

6.3.1. Consolidation theory: airlines will grow large markets by the industry growth rate. The argument is that large markets will need larger aircraft, that industry consolidation and alliances increase this trend and that this trend is happening. The consolidation theory favours one dominant hub. The number of alliances determines the number of primary hubs on each continent. In Europe, the consolidation theory would mean three major intercontinental hubs.

6.3.2. Fragmentation theory: fragmentation theory states that a small number of large markets peak early (focus on major hubs). The rest of history is the story of these initial markets being bypassed in various ways. The fragmentation theory supports secondary hubs. According to David Gillen of UBC, history supports the fragmentation theory as demand growth

translates into frequency growth, not in capacity growth. Moreover, large markets are not growing as fast as the consolidation theory predicts.

6.3.3. The consolidation theory with its giga-hub scenario would favour Paris CDG and larger aircraft (A380). The fragmentation theory would lead in the direction of Air France-KLM having multiple hubs. The fragmentation theory is currently more persuasive looking at history.

6.4. In case of a giga-hub scenario, Air France-KLM is likely to favour Paris CDG because of its larger local demand, but the airport is also more difficult for a hub-airline to dominate[18].

6.5. The future of the Schiphol and Paris CDG hubs will be determined by Air France-KLM and will be influenced by possible cost advantages at Schiphol and Paris CDG. In essence, the airports of Schiphol and Paris CDG consider themselves as competitors. Key variables are visit costs, service quality, local O/D demand and capacity offered[19].

6.6. The intercontinental networks of both Amsterdam and Paris CDG are rather complementary. Network specialization would favour a multi-hub strategy. In this case, Amsterdam could specialize in North-America and Asia/Pacific where it has a comparative advantage.

6.7. Should the combined Air France-KLM group decide to favour one of the hubs, it would be, at least in the medium-term, limited by traffic rights enshrined in bilateral agreements[20].

6.8. The overall market-share of Air France-KLM will be larger with two hubs than with one[21]. Otherwise, rivals will take your market share at the secondary hub. For example, Air France-KLM is not likely to leave the US market from and via Amsterdam to the competition. In other words, dominated secondary hubs can be used to keep out the competition.

6.9. As more hubs in Europe fail, the position of Amsterdam will become stronger. Without Amsterdam, there may be insufficient hub capacity in North-western-

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Europe. Brussels and Gatwick have already been de-hubbed. Copenhagen has a weak position for long-haul[22].

6.10. Secondary hubs such as Amsterdam have much smaller home markets than the primary hubs (such as Paris CDG) but have established good feed, reasonably good yields and low costs. Low-cost-carriers have further scope for entering their short-haul home markets, and this will affect yields. Their long-haul sectors may not be targeted as much as the primary hubs since they have much smaller home markets, but the major hub operators will compete with them fiercely[23].

6.11. There remains a risk that if demand dips or Amsterdam's short-haul network becomes ravaged by low-cost airlines, yields at Amsterdam fall. Then the quickest way to improve viability will be to move long-haul services to Paris and withdraw from markets in Amsterdam[24].

6.12. Do not forget about massive uncertainty: the assumptions about the future growth of the industry are not a certainty but an assumption, which may vary greatly across markets[25]. Many political, economic, social and industry variables are important for future growth patterns but difficult to predict and are also surrounded with uncertainty. Many disruptures of the trend are possible. These uncertainties should be taken into account when considering the future of the Air France-KLM network.

7. Prospects: Summary

7.1. The prospects for the position of Schiphol as a primary, intercontinental hub besides Paris Charles de Gaulle in the network of Air France-KLM are mixed.

7.1.1. In the short run (until 2008/2012), network quality is protected by the State Assurances between the Dutch government and Air France-KLM. Air France-KLM performance well from a financial point of view. Network at Schiphol is still growing but market share is stabilizing.

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7.1.2. In the longer run, fragmentation theory (which is supported by historical developments) supports the idea of a multi-hub system with Amsterdam and Paris Charles de Gaulle being (geographically specialized) intercontinental hubs. In addition, hub capacity in Northern Europe is scarce. Without Amsterdam, there may not be enough hub capacity to accommodate traffic growth within the SkyTeam alliance. Moreover, bilateral agreements enshrine in the medium run the opportunities for the airline to swap intercontinental destinations between both hubs. Furthermore, strategic positioning may be an argument for Air France-KLM to operate a secondary hub at Schiphol and to keep out competition.

7.1.3. On the other hand consolidation theory and the giga-hub scenario are supported by the introduction of the A380 in the Air France-KLM network. Besides, low-cost carrier development in a limited OD market remains risky for the development of the secondary hub. In addition, multi-hubs that close to each other are not optimal from a network economic point of view. Given the larger OD market of Paris, Paris CDG will most probably be the preferred hub in the giga-hub scenario. Given the still considerable OD market, Schiphol will have a substantial number of non-exclusive long-haul destinations even in the giga-hub scenario.

7.1.4. Keeping aero political and capacity variables constant, the development of Amsterdam Schiphol as a secondary hub besides Paris CDG will depend on the business economic balance between complexity costs and the loss of density economies versus the value of strategic positioning, revenues of long-haul services, increased aircraft utilization and increased market share by simultaneously developing two long-haul hubs.

7.1.5. The prospects for Amsterdam Schiphol have been summarized in the figure below

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Future prospects for Amsterdam Schiphol as an intercontinental hub within the Air France-KLM network

Strengths State Assurances guarantee short-term network quality OD market will always guarantee certain number of long-haul destinations Good traffic feed Strong comparative position of AMS in North-America and Asia-Pacific Air France-KLM financially relatively healthy	**Weaknesses** Lack of big home market Restricted environmental capacity AMS Reliability runway system Limited HST network
Opportunities Shortage of hub-capacity in Northern Europe Fragmentation theory supported by history: growth translates in frequencies not in capacity Networks of Amsterdam and Paris CDG rather complementary Small OD market AMS limits attractiveness for entry by low-cost carriers Strategic positioning argument favors multi-hub network	**Threats** Multi-hub networks not optimal Consolidation theory supported by A380 at Paris CDG H-pier: scope for low-cost carriers to enter rather small short-haul OD market at Schiphol Dips in demand or rapidly declining yields at Amsterdam may result in removal of services from Amsterdam to Paris CDG Future growth restricted by environmental capacity limitations Capacity increases expected at Paris CDG Uncertainty future US SkyTeam-partners and their hubs

8. **Implications for national aviation policies and airport planning**. How can governments (in particular the Dutch administration) and airport authorities and planners positively influence or facilitate multi-hub development?

8.1. Hubs are a means to achieve network quality, but are not a goal in itself[26]. Hence, the issue for Amsterdam Schiphol is not being a primary hub but to have network quality to support the mainport strategy. To be a large airport is more important than to be a hub. In this respect, Amsterdam Airport Schiphol has defined 50 primary destinations it wants to be connected with[27].

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8.2. Active monitoring of the development of the network quality of Schiphol and Charles de Gaulle and in particular the State Assurances. Governments can only act then when they know to what extent both hubs show an equal and balanced network development.

8.3. Level playing field: fair competition from an economic point of view should be possible between Amsterdam Schiphol and Paris Charles de Gaulle/ other airports as well as between Air France-KLM and other airlines: Chapter 11, security, pensions, airport charges, taxes, and bilateral traffic rights[28]. In this respect it is important to take note of the consequences of a dual till system for the airport charges at AMS versus a single till system at Paris[29]. This could affect the level playing field substantially.

8.4. Providing airport and airspace capacity is the key for hub-development[30].

8.5. Invest in the local catchment area of Amsterdam Schiphol to support OD demand[31], for example by means of investments in landside accessibility (HSTL, road, rail). In comparison to Paris, the catchment area of Schiphol is one of its major weaknesses.

8.6. Be careful with low-cost carriers at a secondary hub. On the one hand, low-cost carriers can provide more efficient use of airport resources, generate income of the airport (in particular during economic downturns), stimulate consumer welfare due to larger network spread, higher frequencies and lower ticket prices[32]. In addition, facilitating low-cost carriers is a risk spreading strategy of an airport to decrease the dependency of a single hub carrier in an uncertain environment[33]. On the other hand low-cost carriers can ravage the relatively small short-haul OD market of a secondary hub and may drive down yields of the hub-carrier[34].

8.7. Coordination between the French and Dutch governments with regard to code-sharing provisions in bilateral treaties is important. Code-sharing helps specialisation of both hubs on international routes. Cooperation between both

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governments on this issue has been successfully ever since the merger. This coordination could, in theory, be used as a tool to direct traffic between Paris and Schiphol. However, both governments are looking at the balanced specialisation but do not want to interfere in the commercial strategy of Air France-KLM[35].

8.8. If active hubbing should decline at Amsterdam Schiphol, the airport can follow non-exclusive strategies: 1) Focus on premium, high-yield traffic and 2) create own feeder traffic by improving land-side accessibility and by lowering costs to low-cost carriers, which could lead to an increase in passive hubbing[36].

8.9. If active hubbing should decline at Amsterdam Schiphol, the Netherlands may try to maximize the number of direct long-haul flights by giving seventh freedom rights to other European or non-European major carriers. Major non-local carriers are preferable to local players since new local players will lack the size and financial backing to endure Air France-KLM and competition in general[37].

8.10. However, the major problem with other major carriers establishing a hub at Schiphol is the lack of local feeder traffic. In addition, most major hub-airlines are involved in global airline alliances (Oneworld, Star, and SkyTeam). These alliances already have their own hubs at each continent[38].

8.11. If seventh freedom rights would be given to potential hub-competitors (Emirates, Cathay, Singapore Airlines), the strategic positioning argument of secondary hubs becomes important. Air France-KLM may want to develop its secondary hub because the carrier wants to keep out competition and maintain market share.

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