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The impact of airline alliance terminal co-location on airport operations and terminal development

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A B S T R A C T

The notion of co-locating alliance carriers to their designated terminals in airports has gained significant interest in recent years. While benefits on the part of airlines are made clear by existing literature on alliance-hubbing, the tangible benefits to airport operators are less clear due to a lack of studies in the literature. This paper considers existing cases of London Heathrow, Paris Charles de Gaulle and Tokyo Narita Airport, and applies their operational practices to a medium-sized airport in Asia Pacific to evaluate the universal applicability of alliance member co-location. Although some operational and financial improvements are observed, the paper concludes that implementation of this concept should not be done through a one-size-fits-all approach.

1. Background

The notion of international airlines collaborating for their mutual benefit through the formation of strategic alliances has gained credibility in recent years (Evans, 2001). These strategic alliances, along with a portfolio of co-ordinated synergies, have already impacted on the operations of airport infrastructure worldwide. Being part of a multilateral alliance allows airlines to access markets and resources otherwise not attainable due to current geographical and regulatory constraints (Gudmundsson and Lechner, 2006). To take advantage of each other's network coverage, alliance hubs have emerged at major airports where member airlines' services are heavily concentrated. As a result, the implementation of the concept—alliance terminal co-location—has become a major development in recent alliance strategies, as an airline-side effort to strengthen connectivity and streamline asset utilisation at hub airports. With additional terminal capacity becoming available at many major airports, and as a stable pattern of alliances begins to emerge, airport operators around the world have begun to embrace the concept of alliance terminal co-location and grant member airlines more logical terminal allocations.

Under hub-and-spoke operations, a hub's connectivity is often measured by the number of meaningful connections generated during each schedule wave (Goedeking and Sala, 2004). While shorter connecting times would create a greater number of flight-pairs during each schedule wave without having to extend its duration, a key benefit of airline-dedicated facilities is that they increase the likelihood of intraline connections by making it easier and faster for passengers to transfer to another flight within the same terminal or terminal area (De Barros et al., 2007; Phillips, 1987).

A survey of airlines participating in the alliances showed that the greatest increase in passenger traffic was observed primarily on hub-to-hub routes, and secondarily on hub-to-non-hub routes (Iatrou and Alamdari, 2005). In other words, the provision of seamless connections through hub airports has played an important role in the upsurge of alliance traffic. At many multi-terminal airports, such as London Heathrow Airport, prior to the alliance terminal co-location exercise, the allocation of facilities was made with little effort to minimise the number of inter-terminal transfers required. Instead, sectorisation of services between terminals was determined in such a way that routes serving a similar geographical region used to leave from the same terminal (Hanlon, 1989).

Options towards reducing or removing multi-terminal operations through the expansion of existing or building of new terminals address only the supply-side of the airport congestion problem. To achieve the operational and financial synergies similar to those derived from airline-dedicated terminal facilities in a common-user terminal environment, all three global strategic airline alliances have negotiated, or are in the process of negotiating, alliance terminal co-location at their respective hub airports. This demand-side effort is designed to create synergies in two aspects: one is to improve connectivity and reduce the minimum

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connection time (MCT) at key hub airports; the other is to eliminate replicated station costs by consolidating common processing and brand representation through joint airport equipment and facilities (Wu, 2010).

In a study on the impact of airline hubbing on airline economics in the US, Kanafani and Ghobrial (1985) found that much of the available evidence concerning station costs suggested that average costs per passenger did not necessarily decline with passenger volume at an airport. While it was concluded that the economies of scale of airline hubbing did not apply to station costs, the result may be different in today's alliance hubbing context where station equipment and passenger facilities are more commonly shared than before. Star Alliance has long incorporated the 'Move Under one Roof (MUoR)' concept as a part of its key alliance strategy. The objective of the MUoR concept is to develop exclusive Star Alliance terminals or terminal areas at hub airports to provide customer services (e.g. check-in counters and ticketing office spaces) by utilising member airlines' resources more efficiently (e.g. lounges and ground handling equipment).

By 2010, almost all the world's major network carriers were integrated with, or were being sought by, one of the three multilateral strategic airline alliances (oneworld, SkyTeam and Star Alliance). In a list of established and emerging airport business models proposed by Feldman (2009), the author highlighted the strategy of being "alliance anchor hubs" as a successfully established business model for airports around the world. With both parties having the intention of strengthening the airport's role as an alliance hub, airport operators and airlines need to work together to ensure that their facilities and services are capable of adapting to today's competitive and economic environment. While Feldman considered that the business model of being an 'alliance anchor hub' is more relevant to airports that can attract high volume of passengers each year, he did not acknowledge that the context of alliance hubbing today is not only limited to co-ordinating network and attracting connecting passengers, but also facilitating the consolidation of back-office functions and sharing of airside resources and operations management for cost reduction.

Hence, this paper aims to better understand why some airport operators have supported the 'alliance terminal co-location' concept—even at locations with low volumes of connecting traffic—apart from identifying the potential operational and financial incentives and implications for airports to implement the strategy. This paper is organised as follows: section two provides a brief description of the methodology used; section three provides a systematic discussion of three example airports that have recently implemented the terminal co-location concept; this is followed by a case study in section four with conclusions provided in section five.

2. Methodology

The underlying reasons motivating airport operators to implement the concept of alliance terminal co-location are varied and complex. Some are directly related to the strategic development of global airline alliances, while others are concerned with the operational characteristics and financial structure of the airport operators themselves. To explore the rationale of the implementation of alliance terminal co-location at airports worldwide, we analyse three sample airports that had gone through terminal co-location exercises in the past few years, including London Heathrow Airport, Paris Charles de Gaulle Airport and Tokyo Narita Airport. These airports were selected based on the following criteria: 1) a network hub for at least two of the three major airline alliances (i.e. oneworld, SkyTeam and Star Alliance) and 2) with alliance terminal co-location already implemented.

A series of interviews with airport authorities were conducted both face-to-face and by email correspondence. Prior to contacting the airport operators of the above sample airports, secondary data concerning each airport's airline activities, alliance initiatives, operational statistics as well as financial characteristics were gathered to formulate an understanding of how each sample airport exercised the concept of alliance terminal co-location in its unique business environment. Once contact with each sample airport was established and the intentions of the case analysis were communicated, an interview was arranged to collect primary data at each sample airport. Moreover, the meeting presented a unique opportunity to observe and document the specific airline/airport constraints or merits experienced at each sample airport as a result of implementing the concept, which could later be tested on the case study airport.

To evaluate the universal applicability of findings from the qualitative study of sample airports, they are applied to a medium-sized Asia–Pacific airport as a case study. In particular, we focus on the allocation of check-in counters and aircraft parking bays at the case airport's international terminal. A typical week schedule of the Northern Summer 2011 (NS11) season is applied in this study as the 'Base Case' to reflect the real-life passenger and aircraft demands at this terminal. For the purpose of assessing the operational and financial impact of the alliance-driven common check-in concept at the case airport, a proposed scenario is assessed against the base case. In this scenario, alliance-driven common allocations are applied to airlines of oneworld, SkyTeam and Star Alliance, while the remaining non-aligned carriers adopt their existing block allocations. Existing terminal resource allocation parameters, e.g. passenger arrival profiles, transaction times and check-in allocation procedures, are applied to both the base case and the proposed scenario.

To analysis the operational impact of the alliance-driven terminal aircraft parking bay allocation, the base case is assessed against the scenario in which the allocation of terminal aircraft parking positions is prioritised to flights operated by airlines of oneworld, SkyTeam and Star Alliance; flights operated by non-aligned carriers are assigned to the terminal parking positions wherever possible, otherwise to the remote parking positions. Existing apron limitations and allocation procedures are used as a guideline for aircraft parking allocation criteria and priorities. A key indicator used to determine the operational efficiency of the alliance-driven terminal aircraft parking allocation is the number of flights that require passenger bussing operations between the terminal and remote aircraft stands.

3. Existing terminal co-location cases

While the current airline alliance groupings might serve as the backdrop to an airport operator's decision to implement the 'alliance under one roof' concept, airports will only embrace the idea when their internal circumstances make this the correct operational and/or financial move. For the purpose of validating the hypothetical driving forces for airport operators to adopt the strategic arrangement of alliance terminal co-location, three global hub airports—London Heathrow Airport (LHR), Paris Charles de Gaulle Airport (CDG), Tokyo Narita Airport (NRT)—with the concept currently in place are selected as the sample airports for this paper's case analysis.

3.1. London Heathrow Airport (previously managed by BAA Airports Limited – now called Heathrow Airport Holdings)

London Heathrow Airport up until recently had five passenger terminals and a pair of parallel runways. Three terminals (T1–T3)