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A Conceptual Framework for Measuring Airline Business Model Convergence

Authors

Jost Daft

Sascha Albers

University of Cologne

Faculty of Management, Economics and Social Sciences

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Authors

Jost Daft
University of Cologne
Dept. of Business Policy & Logistics
Albertus Magnus Platz
50923 Köln, Germany
Tel. +49 221 470-4318
daft@wiso.uni-koeln.de

Dr. Sascha Albers
University of Cologne
Dept. of Business Policy & Logistics
Albertus Magnus Platz
50923 Köln, Germany
Tel. +49 221 470-6193
albers@wiso.uni-koeln.de

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A Conceptual Framework for Measuring Airline Business Model Convergence[1]

Abstract: This paper develops a measurement framework that synthesizes the airline and strategy literature to identify relevant dimensions and elements of airline business models. The applicability of this framework for describing airline strategies and structures and, based on this conceptualization, for assessing the potential convergence of airline business models over time is then illustrated using a small sample of five German passenger airlines. For this sample, the perception of a rapprochement of business models can be supported. This paper extends the mostly qualitative and anecdotal literature on convergence in the airline industry and provides a platform for further empirical convergence studies.

Keywords: Airline strategy, convergence, business models

JEL-Classification: L10, L91, M19

[1] This paper will be published in one of the forthcoming issues of the Journal of Air Transport Management (JATM)

1 Introduction

In the field of strategic management, the predominant paradigm of a sustainable competitive advantage is based on the notion that efficient and effective leveraging of idiosyncratic resources and capabilities results in superior firm performance (Grant, 2010). This notion does not preclude the existence of similarities, but it does imply that firms at least need some unique resources and capabilities in order to perform better than their competitors. Empirical studies support this view and even indicate that business strategies that evenly converge toward the mainstream middle tend to show lower performance than "pure" strategic orientations (Thornhill and White, 2007). Seemingly oblivious to these findings, a trend of convergence of strategies and structures ("business models") can be observed in the airline industry (e.g., Bell and Lindenau, 2009). Airlines such as easyJet and Air Berlin, which were initially based on rigorous low-cost practices (such as avoiding major airports or offering only point-to-point networks), evolved toward so-called hybrid business models by implementing practices that had previously only been implemented by established full-service carriers (Dunn and Dunning-Mitchell, 2011).

However, convergence also has positive effects if it reflects the diffusion of efficient processes and practices among firms. Such a process of standardization and homogenization based on diffusion of knowledge is a fundamental part of the competitive process (Lieberman and Asaba, 2006) and, in particular, is well known from mature industries (Grant, 2010). However, especially in mature industries that provide widely homogenous products, as in the passenger airline industry (Tarry, 2010), incumbents are almost desperate in their attempts to aim at differentiation options and have to balance intentional and reasonable imitation to maintain competitive parity.

Hence, business model configurations and, in particular, their similarities seem to matter significantly. Given this importance and the stipulated effect of such configurations on performance, the issue of business model similarity warrants analysis, especially in the highly competitive and notoriously unprofitable airline industry. However, a comparison of airline business models requires that they are coherently assessed. Although the need for a comprehensive framework to precisely describe and quantify airline business models has been recognized (Mason and Morrison, 2008), it remains unmet. Extant scientific work on the components of airline business models is mostly based on anecdotal accounts rather than being rooted in coherent empirical studies. Additionally, a systematic assessment of the evolution of

airline business models (whether converging or diverging) has yet to be subject to scientific inquiry.

Therefore, the aim of this paper is to propose a systematic and methodically founded approach to the diagnosis of business model convergence. This study develops a measurement framework that synthesizes airline and strategy studies and identifies relevant dimensions and variables of airline business models. The framework is then exemplarily applied to an initial sample of five German passenger airlines to illustrate its value for empirically assessing the convergence among airlines over time. The paper ends with an outlook to further research.

2 Business Model Concept

The business model (BM) concept is comparably new in the management area and was devised in the mid-1990s to offer investors a practically accessible, systemic approach to describe and asses a company at a given point in time (Morris et al., 2005; Shafer et al., 2005; zu Knyphausen-Aufseß and Zollenkop, 2007). Closely linked to the rise and fall of the new economy, researchers widely received the BM concept despite severe critique of its usefulness and demarcation from the original strategy term (Doganova and Eyquem-Renault, 2009; Porter, 2001). Still, an overall accepted definition of a BM and its defining components is lacking (Zott et al., 2011).

However, most of the extant approaches follow a similar logic of describing a company using a certain number of constitutional components and sub-dimensions – even though the choice of model layers, component number, and contents of these categories vary widely.

Considering the component layout, the proposed frameworks consist of between three and eight constituting components. Whereas some approaches are mostly similar in their structure and phrasing, others vary significantly. Nonetheless, the common theme of describing the architectural backbone (or value creation system) of the company is observable throughout most of the approaches. Table 1 gives an overview of selected conceptualizations of business models.

Table 1 Selected perspectives on business model components

Author	**Number of components**	**Main themes**
Hamel, 2000	4	Customer interface, Core strategy, Strategic resources, Value network
Alt and Zimmermann, 2001	6	Mission, Structure, Processes, Revenues, Legal issues, Technology
Weill and Vitale, 2001	8	Strategic objectives, Value proposition, Revenue sources, Success factors, Channels, Core competencies, Customer segments, IT infrastructure
Magretta, 2002	3	Value proposition, Customers, Revenue sources
Bieger and Agosti, 2005	8	Growth concept, Organizational formation, Cooperation concept, Competencies, Coordination concept, Communication concept, Revenue concept, Product/Service concept
zu Knyphausen-Aufsess and Zollenkop, 2007	3	Product-market-combination, Configuration of value chain, Revenue generation mechanism
Richardson, 2008	3	Value proposition, Value creation, Value capture
Casadesus-Masanell and Ricart, 2010	3	Policy, Governance, Assets
Al-Debai and Avison, 2010	4	Value proposition, Value architecture, Value finance, Value network

Source: Adapted from Morris et al., (2005)

Given the aim to provide quick access to the value creation system of a given organization, eventual business model components need to be very general yet comprehensive, and able to grasp the specifics of a value generation process in highly diverse settings of different industries. Therefore, distinguishing a generic and an industry-specific scheme seems useful, where the latter is specified for a given industry context, for example, the airline industry. Such a conceptualization brings four model layers of the BM concept, three for systematically structuring the BM and one (the item layer) for actually measuring it (Figure 1).

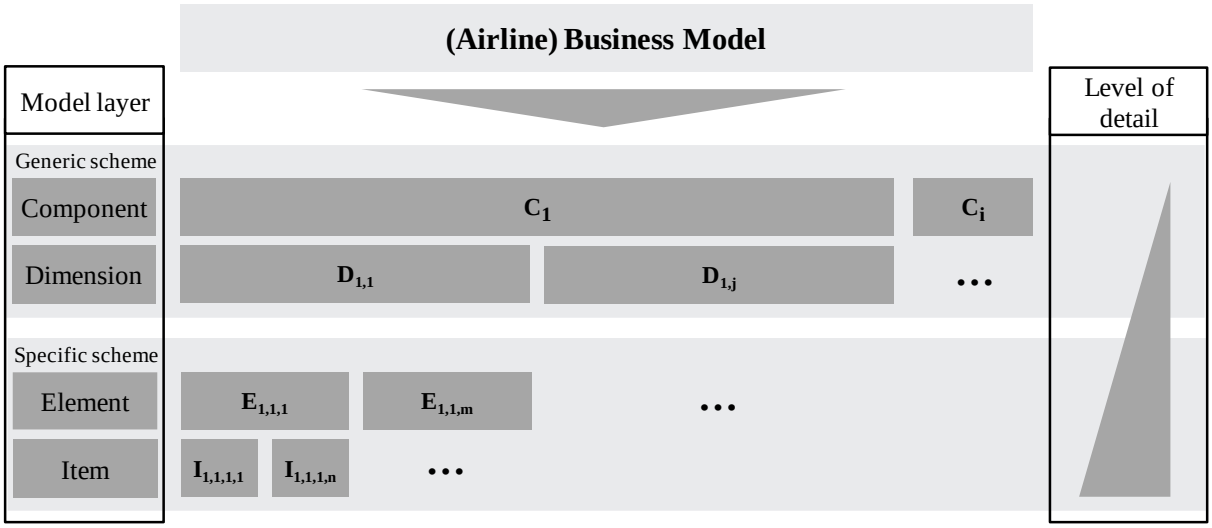

Fig. 1. Principal (airline) business model framework.

Arguably, the design of the BM component layout should be oriented toward the commonly used distinction of decision levels of a company, namely the normative, tactical, and operative levels (e.g., Ulrich and Fluri, 1995). These decision levels cover each functional and organizational layer of a company and, thus, comprehensively constitute the firm's value creation system through its cross-sectional and multidimensional character. Similar foundational hierarchical schemes are common for conveying the central concepts in strategic management (see, for example, Grant, 2010).

For the operationalization of the components and their dimensions and elements, note that a business model can be actively designed: the parameter values of its components are subject to conscious managerial decisions. These parametric components are the bases of the business model framework. In contrast, measures to evaluate the efficiency of the components such as load factor, profitability, or punctuality, do not themselves constitute part of a BM scheme, even though they are often used as input factors in studies on airline business models. Rather, such measures are outcomes or performance indicators of distinct business model practices.

Additionally, this paper contends that the proposed BM framework is applicable primarily to the business unit level (in case of a multibusiness firm) at which the actual value creation system of the company resides. Therefore, multibusiness firms may operate several business models to allow, at the extreme, every business unit to follow quite different value creation logic (Seddon et al., 2004).

3 A Framework for devising Airline Business Models

This paper derives an airline-specific business model concept rooted in the scholarly literature and in airline practice as follows. Based on synthesizing the general strategic management literature with regard to current business model conceptualizations, the airline-specific scheme is developed by reviewing airline- and transport-related studies. To support the validity of the so-developed airline business model framework, nine semi-structured interviews of 1.5–2 hours each were conducted with airline experts. Experts were selected from different companies in the airline industry to gain a broad view on the business model framework by considering not only the airline manager's inside perspective but also, for example, the outside perspective of airline consultants. Different airlines most likely to represent the observable spectrum of airline types were intentionally considered when selecting airline representatives (Table 2).[2]

At the beginning of the interviews, the interviewer(s) and the interviewee reviewed the general approach of describing airlines using an elaborate business model framework and discussed alternative approaches for measuring an airline's strategic and structural design. After establishing a common understanding of the approach, each of the originally proposed model components was sequentially discussed. Interviewers asked whether the interviewee agrees with the components and what might be potential alternatives or additionally needed components. In particular, requirements for a practical application of the model were considered. After the interview phase, the layout of the framework was carefully adjusted based on the results of the interviews.

As a result of the aforementioned approach, the final business model framework is based on three main components that fully describe an airline's value creation system: (1) *the corporate core logic* as the strategic level, (2) *the configuration of value chain activities* as the structural level, and (3) *the assets* of a firm as its resource level. This component design is based on the requirement for developing a framework for assessing airlines at the business unit level.[3]

[2] The focus on German airline experts may constitute a limitation of the transferability of the results. However, this limitation is suggested not to be major given the global nature of the airline industry and the necessary international mobility of airline experts (that is, the interview partners of this study).

[3] Hence, the airline business model framework can be used to individually asses each airline that holds an own air operator's certificate (AOC).Using the AOC as the indicator for an individual airline model can be well illustrated by the case of Lufthansa in Germany. Whereas Lufthansa Passage as the corporate main line operates a quality-oriented business model, the affiliated Germanwings, which holds an own AOC, follows a budget-oriented approach. Subsuming both airlines within one business model would be neither practically applicable nor meaningful.

Table 2 Conducted airline expert interviews.

Company	Company type	Job position of interviewee
Air Berlin	Hybrid Airline	Head of Strategic Network Development
Booz & Company	Consulting	Principal
Booz & Company	Consulting	Senior vice president
Deutsche Lufthansa	Full Service Airline	Senior manager shared services
Franke Aviation & Transportation Consulting	Consulting	Owner
Germanwings	Low Cost Airline	Vice president e-commerce & sales
Lufthansa Consulting	Consulting	Senior consultant
Lufthansa Consulting	Consulting	Senior consultant
TUIfly	Charter Airline	CFO

3.1 Corporate Core Logic

Corporate core logic represents the essential ideas and values that form the basis for the long-term orientation of the firm, and is the essence of how a company intends to place itself within its industry (Hamel, 2000). Because the core logic is usually viewed as a specification of a firm's strategic orientation, it needs to describe how the firm is linked to its environment and how it intends to create value in this specific setting. Therefore, we propose to further differentiate this first component to reflect the specific internal orientation of the firm as its internal policy choices, and the current positioning in its relevant environment as its external value network (Hamel, 2000; Shafer et al., 2005).

The internal policy choice dimension subsumes the key characteristics of a company's basic internal structure that represent its core values. Thus, the internal policy choices covers elements that define the activities that should be done and by whom (Zott and Amit, 2010). More precisely, the internal policy choices can be subdivided into the fundamental *business policy* choices as, for example, reflected prominently in the airline's basic route design, and in the *labor policy* choices for accurately describing the company's structure according to a common

understanding of the organizational layout (Chandler, 2001). Labor policy differences among airlines are, inter alia, suspected in the design of the organizational superstructure (hierarchy architecture) and labor intensity.

The external value network refers to the company's links to the relevant actors in its environment, namely the customers and the external partners needed to develop the value creation system (Shafer et al., 2005). Both customers and external partners, such as suppliers or cooperation allies, are crucial elements in defining the long-term basic concept of a company's business model. The *target product-market combination*, which represents the first element of the external value network dimension, can be described by considering the relevant core products of an airline, namely the transportation of passengers and freight. To measure the target passenger groups, the offered mix of seat classes of an airline appears a reasonable indicator.

With regard to an airline's *interorganizational relationships*, its outsourcing policy and cooperation policy are considered. Both items indicate whether the airline is involved in an extensive network of external partners or operates most of its activities autonomously. The outsourcing policy is evaluated by measuring the degree of outsourcing of major flight-related activities such as catering or maintenance, which traditionally differs substantially between carriers (Al-kaabi et al., 2007). Additionally, inter-organizational embedding of the airline into relevant associations (for example, IATA, AEA, ERA) reflects the airline's corporate strategic orientation (Hillman and Hitt, 1999) and, thus, seems a business model indicator.

3.2 Configuration of Value-Chain Activities

The second component of our three-component business model framework refers to the structural design of the value creation system according to the given corporate core logic as a long-term normative guideline. This component is called the configuration of value chain activities and represents a firm's actual architecture that generates value for customers by putting long-term normative ideas into action (e.g., Richardson, 2008). Thus, an activity system perspective is promoted that accounts for the rather mid- to short-term orientation and that covers the relevant elements for describing the airline's value chain (Zott and Amit, 2010). To identify the respective elements, Porter's concept of the value chain (Porter, 1985) offers a useful guideline (Albers et al., 2005; Richardson, 2008; zu Knyphausen-Aufsess and Zollenkop, 2007). The number of Porter's proposed activities for this subcomponent is aggregated into three

dimensions described as *inbound activities*, actual *production (or transformation) activities*, and *marketing activities*.

The first dimension covers all elements that refer to the allocation of input factors into the transformation stage. The allocation of input factors can be best described by considering the *procurement layout*, which covers all relevant sourcing activities. Given the prominence of the aircraft as a major input factor in the value creation activities of an airline, *A/C sourcing* is separated from the overall procurement function (Morrell, 2007).

To describe the production process of an airline, considering the actual service proposition offered to customers is proposed. This service proposition is primarily determined by the specific *route network* that actually reflects the airline's target markets. Prominent indicators for the route network are, for example, the spatial scope of the network or the flight frequencies offered to/from a specific airport. Additionally, the *cabin product* and the *ground product* visible to the customer are essential parts of the value chain activities of an airline.

Finally, the marketing dimension is used to describe how the airline engages in the selling and promotion of its product portfolio. To clarify the marketing dimension, a distinction into the *distribution* of the product and its *fare structure* is followed (Al-Debai and Avison, 2010). Whereas the first element refers to the basic concepts and activities for merchandising the product, the latter refers to the principle design of the pricing structure (for example, the offer of return fares versus one-way fares). Additionally, we consider the specific *bundling concept* of the airline, which refers to the idea of selling product elements separately (e.g. charging extra for catering and checked baggage).

3.3 Assets

The third business model component covers the unique set of resources and capabilities of a firm, as highlighted in the strategy literature (Barney, 1991). Therefore, this paper considers assets as a distinct component that integrates the resources and capabilities of a company and decidedly depicts the individual shape of its specific value creation system.

Following prominent approaches in the literature on strategy, this paper differentiates tangible from intangible assets (Rugman and Vebeke, 2002) that are further specified for the airline context. Relevant tangible assets for the value creation of an airline are its *fleet structure* and the *infrastructure* that it uses to stay operational. In contrast to the process-oriented A/C

management dimension previously introduced, the fleet structure refers to the actual physical asset of the operated aircraft irrespective of its ownership, because both dimensions cover independent choices. Infrastructure-related assets cover important elements such as own terminals and whether an airline uses individualized IT tools rather than standardized off-the-shelf products.

On the intangible side, the prominence of aircraft and infrastructure finds its counterpart because *human capital*, the airline's staff and its service orientation and skills, is considered the major determinant of intangible assets at the individual level of analysis. On a more impersonal level, the airline will own other intangible assets that allow operations (such as slots at primary airports or patents) and that are essential for the success of its value creation system (*property rights*).

Components	**Corporate core logic**		**Configuration of value chain activities**			**Assets**	
Dimensions	Internal policy choices	External value network	Inbound	Production	Marketing	Tangible	Intangible
Elements	▪ Business policy ▪ Labor policy	▪ Target product-market combination ▪ Interorga-nizational relations	▪ Procurement design ▪ A/C sourcing	▪ Route network ▪ Cabin product ▪ Ground product	▪ Distribution ▪ Fare structure ▪ Bundling concept	▪ Fleet structure ▪ Infrastructure	▪ Human capital ▪ Property rights
Items	For detailed item operationalizing see Tables 3-5						

Fig. 2. Proposed airline business model framework.

Figure 2 shows an overview of the model consisting of three constituting components and their systematic distinction into seven dimensions and 16 elements. To measure the 16 elements, two to three dedicated measurement items are introduced for each element, representing a total set of 40 items. Tables 3–5 show the entire model, which also includes brief explanations for each of the dedicated measurement items.

Generally, one of three different types of scales is used to measure the items. Where applicable, concrete metric numbers for the evaluated item are determined (for example, the number of management layers within the airline for item "Hierarchy architecture"). These parameters are marked with a # sign in the tables. However, for some items, dedicated metrics are either not available or not applicable (for example, to measure the sale logic in the item

"Concept of advertising"). For these items, a solution space with given preset values is proposed (stated in squared brackets). To measure the dedicated airline business model item, one has to opt for exactly one of the given values. In addition to the first and second scale type, a vector scale that allows for multiple entries is additionally proposed. The solution space scale also consists of given preset values (stated in round brackets). However, to assess the item, more than one answer might be applicable (for example, the item "Cooperation policy" can range from zero up to four entries in the case in which the airline operates all types of listed cooperation forms).

To facilitate a consistent benchmark among airlines within the data set, all needed data for measuring the items should be related to the business unit level of the evaluated airline. In this sense, airline group data (such as Germany's Lufthansa) needs to be carefully assigned to the corresponding business units (for example, Lufthansa Passage and Germanwings). The data are aggregated on a yearly basis.

Table 3 Component one: corporate core logic.

Dimension	Element	Item	Scale	Explanation
Internal policy choices	Business policy	Basic route design	[point-to-point, n+n, n*n]	▪ Pure point-to-point concept (e.g., Ryanair) ▪ Uncoordinated grid concept (e.g., Southwest Airlines) ▪ Coordinated hubbing concept (e.g., Lufthansa)
		Business mission	# of components (customers, employees, quality, technology, innovation, growth, profitability, service, value for money)	Evaluation of the airline's mission statement for the nine stated phrases
		Kind of ownership	[private entrepreneurs, institutional investors, private free float, state owned, corporate subsidiary]	Selection of category if it counts for the majority of the shares
	Labor policy	Hierarchy architecture	# of management layers	Consideration of formalized management levels
		Labor intensity	# of employees / # of PAX*1000	Consideration of flying staff and overhead
External value network	Target product-market combination	Target passenger groups	# of actually offered service classes	Consideration of a separated service class if it is actually physically differentiated to other classes; e.g., by higher seat pitch. Premium offers such as serving drinks are related to booking classes and therefore not considered as separated service class
		Role of air cargo	[no cargo transportation, belly use at own risk, belly use at other's risk, belly use for affiliated group company]	Irrespective of transported volumes
		Geographic focus	% SKO domestic	Consideration of SKO under the evaluated airline's AOC only
	Interorganizational relationships	Outsourcing policy	Degree of outsourcing (catering, ground handling, line maintenance, heavy maintenance)	▪ 0: done wholly in house or by wholly owned division ▪ 1: partly done in house or by affiliated division ▪ 2: wholly outsourced to a partly owned division or joint venture ▪ 3: wholly outsourced to an external supplier
		Cooperation policy	Degree of cooperation (interlining, codeshare agreements, alliance membership, joint ventures)	Consideration of any kind of cooperation within the stated categories
		Activity in associations	# of association memberships	Consideration of aviation related associations only

Table 4a Component two: configuration of value chain activities.

Dimension	Element	Item	Scale	Explanation
Inbound	Procurement design	Use of e-marketplaces	[no use, occasional use, regular use]	Any kind of use of e-marketplaces
		Strategic supplier integration	[never, sometimes, regularly]	Any kind of strategic supplier integration
		Fuel sourcing	[fuel hedging, advanced fuel sourcing processes incl. hedging]	▪ Any kind of fuel hedging ▪ Advanced fuel sourcing processes such as logistics services
	A/C sourcing	Strategic A/C sourcing	# of A/C launches/age of airline	Consideration of new A/C types where the airline is launching customer
		Financing of A/C	% of leased A/C in the fleet	% of total A/C that are leased
Production	Route network	Spatial scope	Ø flight distance	Average value among all routes
		Flight frequencies	# of departures per destination per week	Average value among all destinations
		Passenger transfer	[No transfer available, through fare offer, baggage through check-in, seamless travel offer]	Consideration irrespective of whether transfer is to the same or to other airlines
	Cabin product	Seat pitch	Difference between highest and lowest throughout each available service class in cm	Consideration of the entire fleet (short- and long-haul)
		Individual in-flight entertainment	% of A/C equipped with individual in-flight entertainment systems	Consideration of the entire fleet (short- and long-haul)
	Ground product	Lounges available	[0,1]	Irrespective of fare
		Self-check-in	[not available, optional, mandatory]	Mandatory: If check-in at a counter, will be charged additionally

Table 4b Component two: configuration of value chain activities.

Marketing	Distribution	Use of GDS	[0,1]	Any use of GDS (Global Distributions Systems)
		Use of direct channels	% of booked tickets direct	Direct: e.g., through internet or corporate deals
		Concept of advertising	[price oriented, product oriented, emotional oriented, price and product mixed, product and emotional mixed]	▪ Price-oriented: sales promotions for dedicated flights ▪ Product-oriented: focuses on the image of the airline ▪ Emotion-oriented: focuses on emotions, not the product
	Fare structure	One-way fares	[not available, optional, mandatory]	Detectable by comparing prices of combined in- and outbound flights with the respective round trip price
		Fare logic	[static load factor oriented, dynamic yield oriented]	▪ Static load factor-oriented: one fare at a given time per seat ▪ Dynamic yield-oriented: various fares for one seat based on distinct ticket restrictions
	Bundling concept	Catering	[no catering available, catering not included, catering included]	Consideration of drinks and/or meals offers in base fare
		Checked baggage	kg of included checked baggage	Consideration of base fare (if piece concept: sum of total allowance)
		Frequent flyer program FFP	[no FFP available, FFP not included, FFP included]	Consideration of base fare

Table 5 Component three: assets.

Dimension	Element	Item	Scale	Explanation
Tangible	Fleet structure	Homogeneity	Hirschman-Herfindahl index of A/C families in the fleet	The higher the index, the higher the fleet homogeneity. A value of 1 represents a single-type fleet. Consideration of A/C under the evaluated airline's AOC only
		Fleet modernity	Ø age of fleet	Consideration of A/C under the evaluated airline's AOC only
		Ratio of widebody A/C	# of widebody A/C / total # of A/C	Each two-aisle A/C is counted as a widebody
	Infrastructure	Individualized IT tools for major processes	# of significantly individualized tools (scheduling, inventory and RM, passenger service systems, flight operations)	Based on assessing the four stated major IT processes of airlines
		Owning airport facilities	[0,1]	Consideration of both ownership (majority) and long-term (>10 years) contract based exclusive use of terminals, hangers, lounges, etc.
Intangible	Human capital	Flight crew skills	[no dedicated training, using cooperative training facilities, using affiliated training facilities]	For flight deck and cabin crews
		Service orientation of staff	Cumulated Skytrax Cabin Staff Index	Average value of the seven rated Skytrax cabin staff service parameters for each product type (short- and long-haul, economy and business class)
	Property capital	Patents	# of patents registered to the airline / age of airline	Determining for allocation to airline is applicant
		Access to primary airports	% of flights at primary airports	Consideration of primary airport based on a qualitative assessment of its geographic location (distance to the city center), as well as the airport's flight schedule (number departures of scheduled airlines that serve the airport)

4 Applying the developed Business Model Framework to measure Convergence

The model is now exemplarily applied by operationalizing the business models of five selected airlines at distinct points in time. Considering the recent dynamics in the airline markets and the booming phase of new low-cost carrier (LCC) entrants into the market, the period from 2003 to 2010 is chosen, which represents the decade that experienced the most eruptive change within the European airline industry.

For the exemplary data sample, five German airlines likely to illustrate the spectrum of distinct available airline business models are considered. For this purpose, one representative airline following the low-cost approach and one service-oriented airline embedded within a large multiservice aviation group are considered. From the German perspective, Germanwings (4U) is commonly assumed to be a rigorous LCC. In contrast, Lufthansa Passage (LH), as the main line airline within the Lufthansa group, is a commonly used example of a service-oriented premium carrier. In addition to these polarizing examples, the data sample was enlarged by considering Air Berlin (AB), Condor (DE), and Germania (JO), each with business model characteristics in between the observable industry range.

Considering data framing, the entire data set consisted of 1,600 entries (eight years times five airlines times 40 items). However, this particular study concentrates on illustrative items rather than measuring the entire sample. Selecting the items ensured that the illustrative framing contains at least one item per dimension. Finally, eleven items were included in the exemplary convergence analysis.

The exemplary analysis also excluded the intermediate years between 2003 and 2010 but focused on the extremity years. The data were collected from annual reports and airline press reports.

According to the reduced item subset, this study decided to indicate the convergence tendency among the airline business model components using color coding instead of precisely calculating the distances between the item values. Depending on the applicable item range, one grayscale was assigned for each item value (Fig. 3). The item range of the illustrative item sample varies between two for the binary items and a maximum of five, resulting in at most five grayscales. Accordingly, numeric items were subdivided into five equidistant categories, enabling the same color coding to be used to visualize them as well.

	Item values				
Item range	**0**	**1**	**2**	**3**	**4**
2			-	-	-
3				-	-
4					-
5					

Fig. 3. Grayscales for item values.

Although a rather rude approximation, similar item values are indicated without introducing a profound mathematical calculation. Such a precise calculation, as well as completed data framing that includes all 40 items on a year-to-year basis, will be part of further studies once a basic convergence trend is indicated.

Fig. 4 and Fig. 5 show the results for the exemplary convergence analysis. In 2003, most of the measured items show low values represented by light gray colors. Lufthansa is the only airline that showed advanced airline business model characteristics commonly associated with the traditional full-service carrier (FSC) model. For example, Lufthansa was operating an advanced hub-and-spoke network (n*n) whereas the other four airlines were rather point-to-point oriented (p-p). Lufthansa, which already implemented an extensive cooperation policy with several aviation and non-aviation partners, was using its belly capacity for cargo transportation and offered several advanced services to its customers, such as seamless travel and a well-established frequent flyer program. In contrast, none of these characteristics were broadly observable throughout the other airlines.

However, when comparing the item values in 2003 and 2010, the picture clearly changed. Except for Germania, the other airlines clearly began to adopt practices that were only formally used by the full-service airline Lufthansa. These airlines began to broaden their cooperation policy and opened up their belly capacity for cargo transportation. Moreover, advanced passenger services such as seamless travel and frequent flyer programs became commodities among the airlines. Yet, the exemplary convergence analysis also indicated that the movement is mostly driven by former LCC-oriented airlines. In contrast, Lufthansa seems to have a rather stable airline business model as its characteristics remain primarily constant from 2003 and today.

Overall, although the illustrative convergence analysis is based on a reduced item setup, indicating on a rudimentary basis a converging trend in airline business model characteristics in

the German airline industry is possible. Moreover, indications were found to presume a convergence direction toward the original FSC model.

	Business model layout 2003				
Item	**4U**	**AB**	**DE**	**JO**	**LH**
Basic route design	p-p	p-p	p-p	p-p	n*n
Labor intensity	0,121	0,313	0,24	0,189	0,735
Cooperation policy	0/4	1/4	1/4	0/4	4/4
Target passenger groups	1	1	2	1	3
Role of air cargo	no cargo	no cargo	no cargo	no cargo	belly use for affiliated group company
Strategic supplier integration	no	no	no	no	no
Passenger transfer	no transfer available	seamless travel offer	seamless travel offer	no transfer available	seamless travel offer
Frequent flyer program FFP	no FFP available	no FFP available	FFP included	no FFP available	FFP included
Fleet homogeneity	1	0,62	0,63	0,64	0,24
Owning airport facilities	no	yes	yes	no	yes
Flight crew skills	no dedicated training	no dedicated training	affiliated training facilities	no dedicated training	affiliated training facilities

Fig. 4. Selected business model characteristics of German airlines 2003.

	Business model layout 2010				
Item	**4U**	**AB**	**DE**	**JO**	**LH**
Basic route design	n+n	n*n	p-p	p-p	n*n
Labor intensity	0,165 +27%	0,265 -18%	0,5 +52%	0,267 +29%	0,641 -15%
Cooperation policy	2/4	3/4	2/4	2/4	4/4
Target passenger groups	2	2	3	2	3
Role of air cargo	belly use for affiliated group company	belly use for affiliated group company	belly use on other´s risk	no cargo	belly use for affiliated group company
Strategic supplier integration	sometimes	sometimes	sometimes	no	sometimes
Passenger transfer	through fare offer	seamless travel offer	seamless travel offer	no transfer available	seamless travel offer
Frequent flyer program FFP	FFP included	FFP included	FFP included	no FFP available	FFP included
Fleet homogeneity	1	0,36	0,55	1	0,3
Owning airport facilities	no	yes	yes	yes	yes
Flight crew skills	affiliated training facilities	Cooperative training facilities	no dedicated training	no dedicated training	affiliated training facilities

Fig. 5. Selected business model characteristics of German airlines 2010.

5 Conclusion

The aim of this paper was to develop a consistent measurement framework that enables a systematic assessment of airline business models. In particular, similarities among different airlines should be detectable by the framework. For this purpose, this study synthesized the airline- and strategy-related literature and developed a framework based on identified components, its composing dimensions, and the airline industry-specific item layout. The proposed framework and item layout were validated through interviews with airline industry experts. Where needed, adjustments were made to enable this study to develop a framework of three relevant components composed from a total of 40 dedicated items that most comprehensively measure airline business models.

The usefulness of the derived framework was illustrated by exemplarily applying it to an initial sample of five German passenger airlines. Although the exemplary convergence analysis was based on a reduced item subset of only eleven items, a rudimentary indication of a converging trend in airline business model characteristics was possible in the German airline industry over the last eight years.

These results, if confirmed across a larger sample and reinforced through similar tendencies in the remaining BM measurement items, have a strong effect on airline practitioners. By indicating that the widely assumed convergence trend is underway, airline managers are encouraged to explicitly reconsider their differentiation policies. In particular, the carriers that depart from the original, pure low-cost model by offering extended services similar to established FSC are potentially prone to lose profitability (Alamdari and Fagan, 2005). A clear differentiation among the high- and low-price-oriented airline services is key to survival in the airline industry. As an example, Qantas most recently announced a restructuring of its loss-making main line by founding a new premium carrier and, at the same time, expanding its low-cost subsidiaries. This restructuring can be seen as a move toward rethinking the differentiation policies of both LCC and FSC airlines.

Yet, to derive detailed differentiation recommendations for elements of individual airline business models, the rather new topic of airline convergence analysis needs to be studied in greater detail, by both practitioners and academics. Thus, the results support the quest for a more detailed analysis of airline business models over time. By extending the research in this field, future studies should be able to answer the most important emerging question, whether forming a

dominant airline business model design is observable. Moreover, future studies should analyze the effect of a growing similarity among airlines on their overall financial performance.

For this purpose, future research would benefit from considering the entire item set introduced in this paper. Also, the data sample has to be extended to an international perspective that includes a variety of airlines with different backgrounds, such as former national flag carriers, new startup airlines, low-cost oriented airlines, Gulf carriers, or entrepreneur-owned airlines. By considering such a broad spectrum of airlines on a year-to-year basis, precise detailed mapping of converging or diverging trends in different periods among different airline business models is presumed possible.

In particular, a consideration of annual snapshots will help indicate the rate of the developments. Thus, based on the business model framework developed in this paper, assessing whether convergence is a rather new phenomenon and whether its dispersion is or is not accelerating will be possible. Moreover, validating whether the airline business models converge toward the original FSC model or whether originally full-service-oriented airlines begin to adjust their architectural backbone according to core elements of the LCC model will be possible.

This knowledge will be essential for airline managers to precisely analyze the effect on airline performance and to derive strategic recommendations to handle new challenges that might be caused by the growing similarity of airlines around the world. This paper extends the primarily qualitative and anecdotal literature on convergence in the airline industry and provides a platform for further studies in the field of empirical convergence analysis and corresponding strategic airline management research.

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Department of Business Policy and Logistics
Prof. Dr. Dr. h.c. Werner Delfmann
University of Cologne

Albertus-Magnus-Platz
D-50923 Cologne, Germany

spl@wiso.uni-koeln.de
www.bpl.uni-koeln.de

Phone: +49-221-470-3951
Fax: +49-221-470-5007