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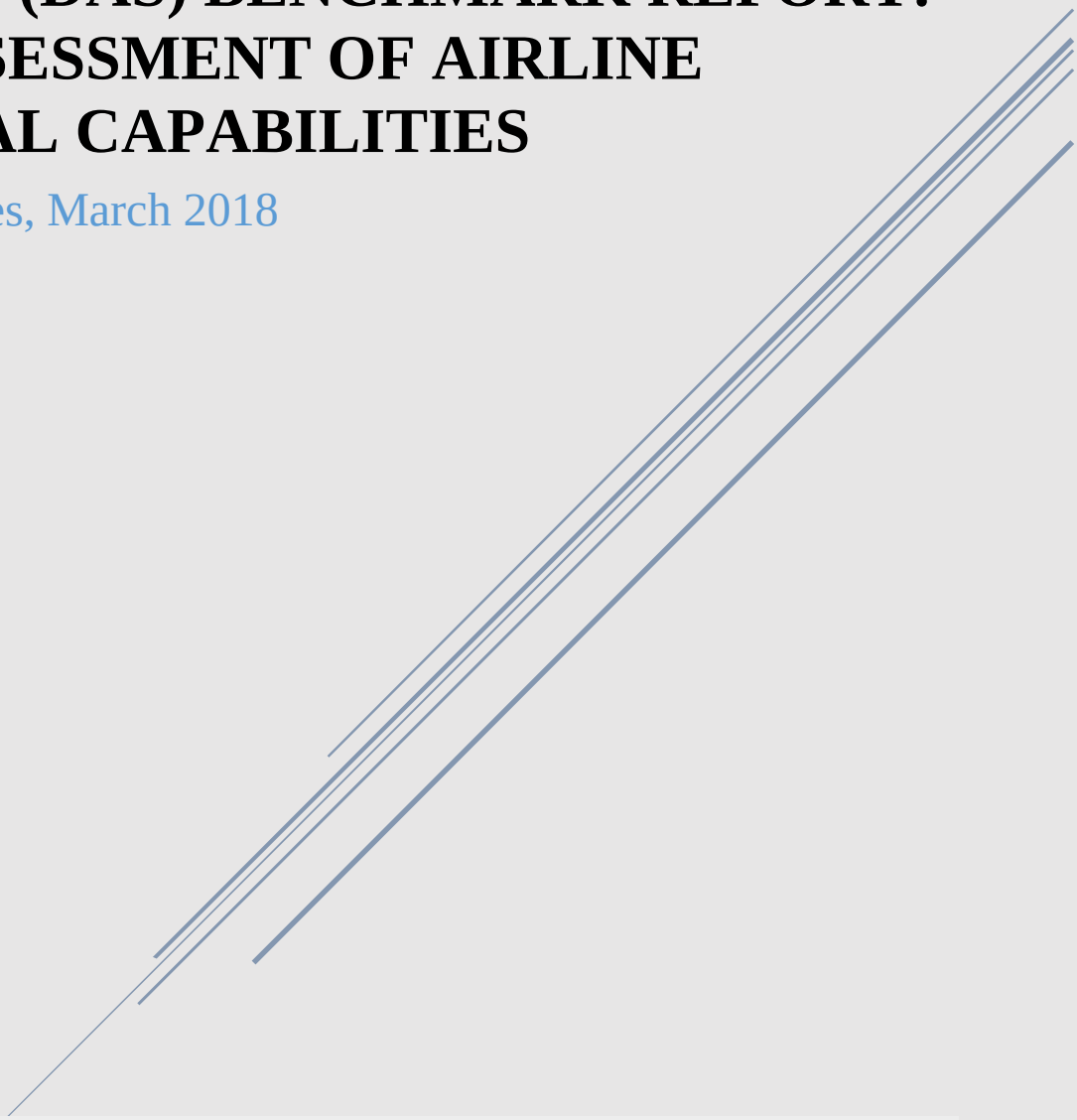
SKAIBLU 2018 DIGITAL AIRLINE SCORE (DAS) BENCHMARK REPORT: AN ASSESSMENT OF AIRLINE DIGITAL CAPABILITIES

Los Angeles, March 2018



AIRLINE E-COMMERCE SOLUTIONS
WE KNOW WHAT IT TAKES TO BE THE LEADER

Contents

SkaiBlu is an e-commerce consultancy advising airline industry clients in the development & implementation of digital strategies

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I. Introduction

This benchmark report by SkaiBlu features an assessment on the digital competitiveness of 90 airlines. The companies surveyed come from different alliance affiliations, geographies, and business models. The assessment of their digital competitiveness is based on research done by SkaiBlu applying a proprietary methodology called the Digital Airline Score or DAS. It involves an evaluation and scoring of a carrier's performance in seven digital areas across 28 proxy indicators (see more details in section III: "Measuring Airline Competitiveness in Cyberspace: The Methodology behind the Digital Airline Score").

Essentially, the DAS methodology is driven by the view that two key factors determine how effectively an airline manages its digital transformation: Adoption and use of e-commerce. Examples of these factors include user friendly digital properties that are fast, intuitive, and click efficient in site navigation, rich in features, and also optimized for mobile commerce and voice empowered applications. Other examples include superior digital data practices, a wide range of digital media use for online advertising and promotion, competitive e-sales & distribution policies, and top quality web customer service via superior self-/assisted service tools and quick responsiveness to customer queries. Airlines that have achieved an advanced e-commerce stage realize important benefits. These include improved economic performance and brand attraction. SkaiBlu defines "Advance E-commerce" as the widespread adoption and competitive use of the internet and digital applications to market products, deliver customer service, and share/exchange information.

Our DAS results show that only a handful of players appear to be well suited to navigate in *pax technica* and manage the next frontiers in cyberspace. For the most part, these are full service, legacy carriers that have made enormous strides in their digital transformation in recent years. Meanwhile, the vast majority of airlines is currently at a less advanced e-commerce stage. Their deficiencies can be attributed to a sub-optimal performance in a wide range of areas, with digital data privacy, web customer service, and digital brand appearance & protection requiring particular attention. They have to improve their digital capabilities – in some cases significantly - if they aim at narrowing any disparities in their web presence. Absent these crucial improvements, the industry might be ultimately moving towards two groups of carriers - one highly digital and continuously advancing their competitiveness and one significantly less digital and falling further behind. This separate and unequal development – or digital divide - does not bode well for future customer experiences, especially where interline travel on alliance carriers or joint venture partners is involved.

With the imminent reshaping of the online travel market place, digital transformation should be a corporate imperative for any airline. To be both effective and sustainable, it requires ongoing leadership, focus, and support by senior management, a trio of trademarks with leading e-commerce carriers.

Any assessment of an airline's digital competitiveness is ultimately subjective. However, we firmly believe that a tool like DAS can allow a more qualified insight into the gaps of an airline's adoption and use of e-commerce and be applied in adjusting, if not setting strategic directions for how to move forward in cyberspace.

We hope you enjoy this report and welcome any comments or questions you might have.

Best regards,

Dr. Michael Hanke

Founder & Managing Director, SkaiBlu LLC

II. High Level Results of DAS Assessment

The 90 companies assessed in 2017 in their digital capabilities come from the three major airline alliances Star Alliance, SkyTeam, and OneWorld (61 carriers in total) that generate in aggregate over 60% of the world's scheduled traffic (in Revenue Passenger Kilometers). In addition, another 29 carriers not affiliated with alliances including full-service carriers (FSCs) such as Emirates and Rwandair as well as several (ultra) low-cost airlines (U)LCAs, for example AirAsia, Frontier, and Ryanair, were part of the survey.

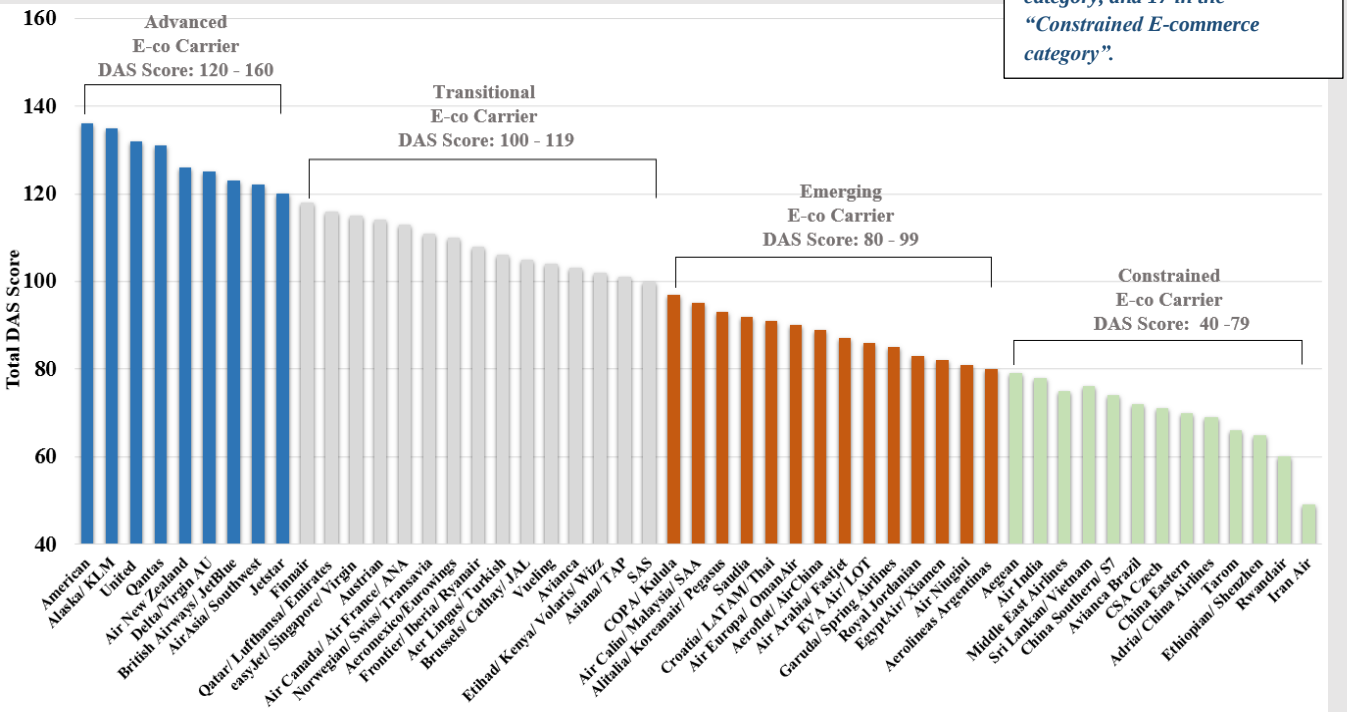
Figure 1: Airlines with Most Advanced Digital Capabilities

DAS Rank	Airline	DAS Points
1	American Airlines	136
2	Alaska Airlines / KLM	135
3	United Airlines	132
4	Qantas	131
5	Air New Zealand	126
6	Delta Airlines / Virgin Australia	125
7	British Airways / JetBlue	123
8	Air Asia / Southwest	122
9	JetStar	120

A total of 13 airlines are considered "Advanced E-commerce Carrier" due to their superior digital capabilities. American Airlines is the top performer closely followed by Alaska Airlines and KLM both sharing DAS rank 2.

Of the remaining 77 carriers in the survey, most fall into the "Transitional E-commerce Carrier" category (a total of 33), followed by 27 airlines in the "Emerging E-commerce Carrier" category, and 17 in the "Constrained E-commerce category".

Figure 2: Total Digital Airline Score (DAS) – Level of E-commerce Advancement (2017)



III. Measuring the State of Airline Competitiveness in Cyberspace: The Methodology behind the Digital Airline Score (DAS)

We define digitization as the "adoption and use of the internet and digital applications to market and sell airline products, deliver customer service, and share/exchange information.

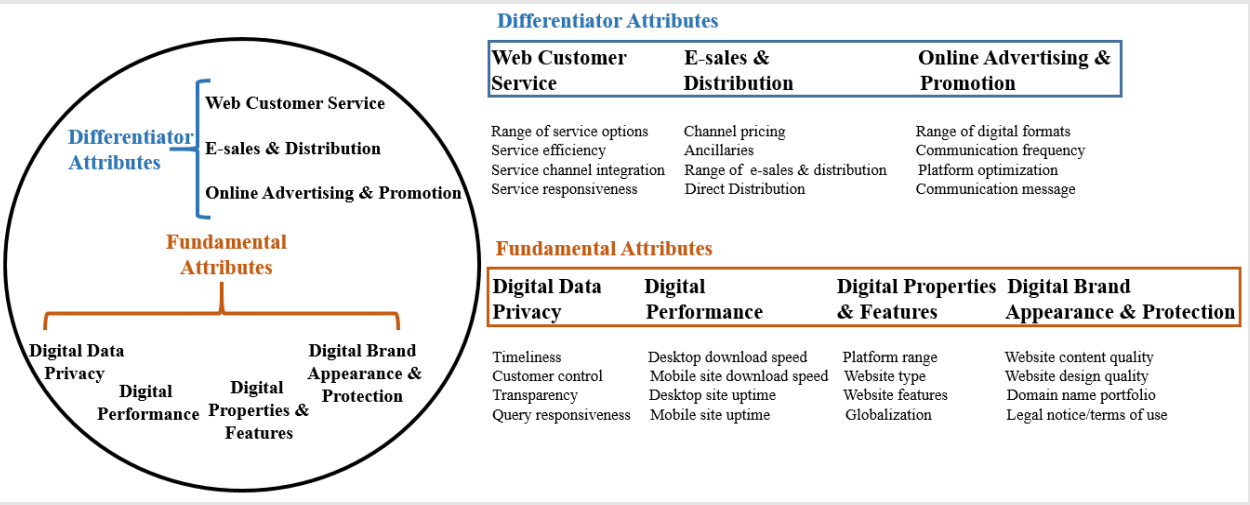
An airline's adoption and use of e-commerce can be measured across seven attributes, grouped into fundamental attributes and differentiator attributes (Figure 3):

- Fundamental attributes (4) – these are fundamental or the essential minimum for operating a digital airline brand. They include digital performance, digital property, digital brand appearance and protection, and digital data privacy.

- Differentiator attributes (3) – airlines usually apply these in their digital value chain to distinguish themselves from competitors. They include online advertising and promotion, e-sales & distribution, and web customer service.

Figure 3: The Digital Airline Score (DAS):

Attributes and Proxy Indicators to Determine an Airline's Adoption & Use of E-commerce



SkaiBlu measures these attributes through four proxy indicators for each attribute. For fundamental attributes, the proxy indicator score ranges from 1 (Poor), 2 (Fair), 3 (Good), to 4 (Excellent). For differentiator attributes, the scores are doubled in recognition of their greater importance over the fundamental attributes. The total maximum score a carrier can earn is 160 (64 for the fundamental and 96 for the differentiator attributes) while the total minimum score is 40 (16 for fundamental and 24 for the differentiator attributes) (Figure 4 on next page).

Figure 4: Proxy Indicators for Fundamental DAS Attributes

Attribute	Proxy Indicator	Rating Scale: 1- Poor	2- Fair 3-Good	4-Excellent
Digital Data Privacy	Timeliness	No time stamp, broken links, outdated privacy contact information	→	Time stamp of recent updates, current with latest country specific privacy laws, industry regulation, best practices, current contact information
	Transparency	No link posting to privacy section, limited if any information of airline's data privacy practices	→	Disclosure & clear language on data practices incl. data collection sources & purpose, data retention periods, 3rd party sharing & protection standards
	Customer Control	No customer control over personal data collected by airline	→	Customer has a say in data sharing/selling by airline, has access to their data profile to view/change, opt-in option if in agreement to be tracked
	Query Responsiveness	No reply to email customer query on data privacy matters	→	Email response by designated privacy contact with clear information relevant to the initial query
Digital Performance	Desktop Site Download Speed	> 10 sec	→	< 4 sec
	Mobile Site Download Speed	> 6 sec	→	< 2 sec
	Desktop Site Uptime	< 98%	→	100%
	Mobile Site Uptime	< 98%	→	100%
Digital Property	Platform Range	Desktop only	→	Multiple platforms incl. desktop, mobile, inflight airport kiosk, wearable, virtual
	Web Site Types	Retail site only	→	Site family incl. blog, all major social sites, subsidiary sites, other special target group sites
	Web Site Features	Industry standard offerings for content, booking, and service	→	Cutting edge features, early adopter
	Globalisation	One site fits all markets	→	Localised web presence for content, booking, service & site design
Digital Brand Appearance & Protection	Web Site Content Quality	Stale content & poor editing	→	Updated multiple times per week, professionally web edited, correct language translations
	Web Site Design Quality	Dated digital look & feel factors, non-responsive to different digital platforms, poor click efficiency, not accessible for disabled users	→	Modern, superior look & feel, platform responsive, all major tasks can be accomplished within 5 clicks, site accessibility for disabled under WCAG, AA
	Domain Name Portfolio	No usage of .com for airline brand, no country specific domains, no brand protection via other domains (cc domains, misspellings, etc)	→	Site uses .com, domains for major sub-brands (FFP, cargo, etc), internationalised/local domains & domains protecting against brand infringement
	Legal Notice/Terms of Use	No disclaimer to serve as liability limitation & no protection of airline intellectual property (IP)	→	Separate site section with specific information on liability limitation & IP protection

Proxy Indicators for Differentiator DAS Attributes

Attribute	Proxy Indicator	Rating Scale: 2-Poor	4-Fair 6-Good	8-Excellent
Online Advertising & Promotion	Range of Digital Media Format	Promotional display ads on own web site and email newsletter	→	Comprehensive media mix with email, display, search (SEM,SEO), augmented reality, advergaming, various social incl. use of social media influencers
	Communication Frequency	Sporadic communication across digital formats	→	Media calendar drives regular communication for key formats (search: all year, email :3-4 x//month, social 5-10 posts/week), programmatic banner advertising
	Optimization for Digital Platform	Communication configured for desktop platform only	→	Optimization of all communication for desktop + mobile platforms
	Communication Message	Focus on broad push-sales promotions only	→	Mix of sales and brand messages, broad and individualized communication, interactive communication inviting customer to participate
E-sales & Distribution	Channel Pricing	No differentiation between offline and online channels for pricing	→	Lowest fares on airline web site only
	Ancillaries	No offering of ancillaries	→	Full spectrum of up-/cross sell products including bundled & a la carte options
	Range of E-sales & Distribution	Focus on direct online sales channels & leisure/VFR segments only	→	Direct sales online channels + cooperation with multiple 3rd parties incl OTA, metasearch, corporate segments
	Direct Distribution	No direct distribution relationship with travel agencies/corporate clients	→	Multiple direct distribution relationships incl. Direct Connect partners with travel agencies/corporates
Web Customer Service	Service Options	Standard assisted-customer service incl phone and email only	→	Mix of assisted customer service incl advanced options (social care, avatars) and range of self-service (FAQ, search, site map, product demos, intelligent personal assistants)
	Service Efficiency	Indiscriminate offering of high & low cost service options	→	Presentation & priority of low-cost self service options over high-cost assisted service options
	Service Channel Integration	Different service options are disconnected & provide for fragmented customer experience	→	Different service options are integrated with each other & offer seamless transition among them
	Service Responsiveness	Below-the-average turn around time in responding to customer queries	→	Above the average response time (email: 2-4 days, chat 1-2 mins, social care < 1 hour)

Based on the total DAS score, SkaiBlu has identified four categories of carriers:

1. **Constrained e-commerce carrier (40 – 79 points)** – airlines have barely begun to engage in e-commerce on a large scale. Their adoption and use of the internet and digital applications is limited. Lack of customer readiness may be one of the external reasons although several internal aspects including lack of overall digital corporate vision, a small talent base, and insufficient resources usually play a role.

2. **Emerging e-commerce carrier (80 – 99 points)** – airlines have made significant progress in adopting and using e-commerce but are still sub-optimal due to a number of factors. These include insufficient resources, limited senior management support, and weak governance/organizational structures.

3. **Transitional e-commerce carrier (100 – 119 points)** – airlines that have a solid and experienced handle on e-commerce. Their adoption and use of e-commerce is above-the-average and these airlines are constantly expanding their digital capabilities. E-commerce plays a significant role in all aspects of these airlines' business.

4. **Advanced e-commerce carrier (120 – 160 points)** – airlines that are most mature in their digitalness. They are in the forefront of deploying new digital applications and related managerial practices. These airlines are highly sophisticated in the use of e-commerce and their talent base is strong. E-commerce is a key priority for corporate strategy. Advanced e-commerce carriers are best suited to embark on a breakout strategy.

One closing comment on DAS: Like any tool designed for gauging a level of advancement across multiple companies in a particular area, there are some inherent limitations of how deep and broad one can be in this process. In our case, scoring the digital capabilities of an airline involves an outside assessment - we can only capture what is customer facing. This means that a quantification through financial details on online revenue enhancements, cost savings or customer benefits from certain digital initiatives is not part of DAS. This type of information is rare and sporadic and generally not contained in airlines' financial reports. Furthermore, the adoption and use of the internet and digital applications for internal operational areas - the back office and flight operations/maintenance are examples - are not part of DAS either. However, we can reasonably assume that DAS still provides for some clues in these areas since their quality has a bearing also on the digital customer experience. Finally, let us keep in mind that technology is a fast moving area and is constantly changing. Thus, DAS can only be a snapshot of a relatively brief window in a carrier's ongoing digital evolution.

With this in mind, the DAS scoring approach can be valuable for several reasons:

- It provides for a sense of what the overall level of digital capabilities at an airline is;
- It allows a better understanding of where a carrier stands relative to its rivals when it comes to the adoption and use of e-commerce;
- It furnishes an enhanced insight in the extent of improvement required by an airline to move to an advanced e-commerce stage;
- It can be utilized for a change readiness assessment that evaluates a carrier's ability to adopt and implement a digital breakout strategy.

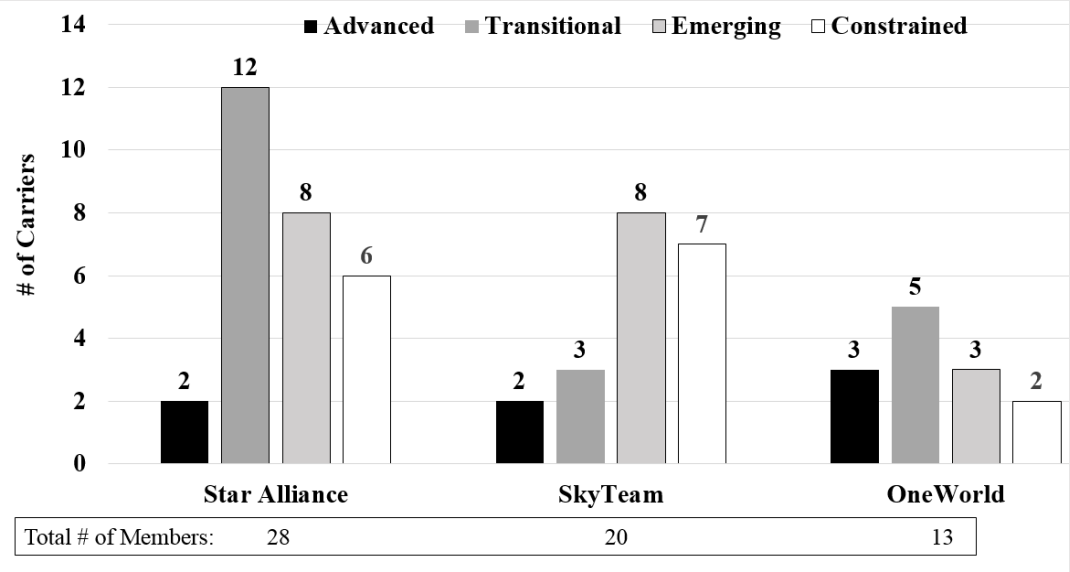
IV. Snaphots of DAS Assessment

The following discussion takes a closer look at SkaiBlu's findings on airlines' digital capabilities in the context of airline alliances, geographic region, and airline business model. Additionally, we present a highlevel review of airlines' main deficiencies in digital data privacy, web customer service, and online brand appearance & protection.

A. Airline Alliances

Among the three major airline alliances, Star Alliance appears to be in a digital leadership position featuring the largest combined number of advanced and transitional e-commerce carriers. At the same time, all three alliances include a significant number of less digitally capable companies (Figure 5). They have much work ahead if they ever want to catch up with the leading airlines within their group. Investment in e-commerce skills, an improvement in e-value chain competencies, and a strategic re-orientation including improved leadership from the top are some of the critical issues to be addressed by the affected carriers.

Figure 5: Level of E-commerce Advancement among Airline Alliances (2017)



Who else is a soon-to-be top player?

Transitional e-commerce carriers poised to join the advanced e-commerce category in the near future due to their ongoing improvement in digital capabilities:

Star Alliance – Lufthansa, Singapore, Austrian, Air Canada
SkyTeam – Air France
OneWorld – Finnair, Qatar

The wide spread of DAS scores within each alliance is an indication that the coordination of activities in cyberspace is less advanced than those in other alliance areas (examples include flight schedule synchronization, airport co-locations, frequent flyer programs reciprocities, and joint marketing). For a traveler, this can translate into an unnecessarily frustrating experience, especially when engaging digital touchpoints for journeys involving interlining between carriers from the same alliance. Take the use of seat maps on online bookings platforms. Star Alliance carriers Lufthansa and TAP offer access before a ticket is purchased while EVA Air and Ethiopian Airlines do not. The area of privacy policy is also interesting: Why do alliance carriers serving European markets feature significantly different digital privacy sections on their website? After all, they are all subject to the same rules of engagement under the EU legislative framework for digital data protection. These two examples are just the tip of the iceberg.

There could be an opportunity for improving a carrier's digital capabilities through closer coordination with other member airlines. We have already seen movements in this direction within alliances subsets, the adoption of direct connect initiatives by the Lufthansa Group and IAG being one illustrative example. There is more that could be done. Some venues possibly used for this process may involve standing e-commerce committees that share best experience and practice, ongoing employee exchange programs, and joint hackathons and RFPs for new digital offerings. Some of this might even be accomplished under the patronage of the three standalone alliance organizations Star Alliance, SkyTeam, and OneWorld. They have valuable experience/know how to establish seamless and consistent travel products and services for their member carriers. So why not using these assets as part of a larger initiative to deliver a consistent digital experience to travelers on alliance interline journeys? Possibly, another approach, albeit more radical, might make use of outsourcing selected services to the most capable digital provider within an alliance. Think of SkyTeam members' social customer care service "brought to you" by KLM with its unrivalled performance in this area or imagine e-commerce savvy Air New Zealand becoming a "digital GSA" and operating a Star Alliance partner's web presence behind the scenes in selected international markets. In essence, harmonizing the cyberspace activities across alliance members can lead to important benefits for both airlines and travelers.

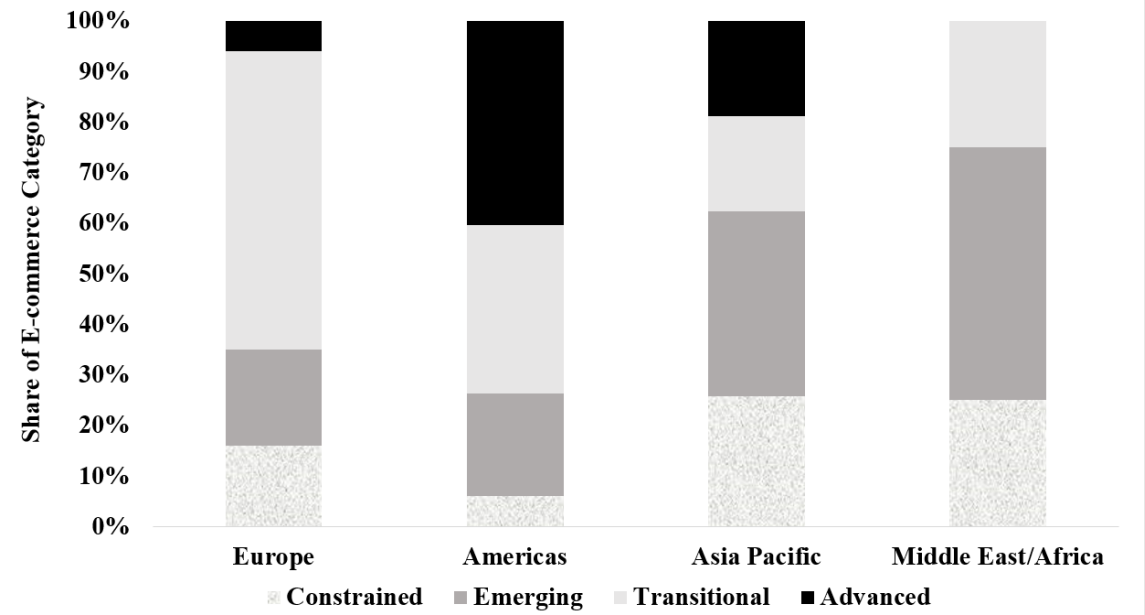
B. Geographic Regions

1. Americas

The largest share of top e-commerce capable carriers is found in the Americas, specifically in the US as the world's single largest and most mature market for online travel (Figure 6). American Airlines and Alaska Airlines are among the best-in class e-commerce carriers followed closely by United Airlines which may well match or possibly even top these two in the near future. Delta Airlines and JetBlue are also very competitive companies each earning solid DAS points in the advanced e-commerce category. However, in order to catch up with their leading US counterparts, both carriers need to make improvements in the area of digital privacy. Also, there seem to be inconsistencies in the airlines' channel pricing. We observed numerous instances of lower fares being offered via OTAs than through their own websites, thus sending conflicting signals to the market place where the best fares are actually available on an ongoing basis. This issue is not certainly the case with Southwest and Frontier that promote their best fares consistently through their own digital properties. Other e-sales & distribution areas, especially their ancillary revenue performance, are equally strong. Nevertheless, both companies show shortcomings in web customer service and digital brand appearance. Frontier's digital presence is also limited since it does not offer inflight wifi and or other emerging platforms such as IoT, wearable computing, and virtual reality.

Furthermore, our DAS assessment features seven airlines from Latin America and includes Aeromexico, Aerolineas Argentinas, Avianca, Avianca Brazil, COPA, LATAM, and Volaris. This group's digital capabilities is modest with Aeromexico (DAS of 110) being the most evolved carrier. Aeromexico still needs to put in place a number of improvements in both in digital brand appearance and digital presence.

Figure 6: Level of E-commerce Advancement by Region



The remaining-Latin carriers all have a wide spectrum of digital issues to fix with Avianca Brazil being in worst shape (they are ranked 81 in our 90-carrier strong survey). Examples of their poor performance in the fundamental DAS areas include:

- slow page loads
- broken site links
- many language mixes on a single site (Portuguese/English)
- very weak handling of digital data privacy

In the DAS differentiator areas, they suffer from numerous shortcomings. These are:

- an extremely erratic posting frequency on social media (for example on Twitter they post sometimes multiple promotional tweets on a single day and then pause completely for several days)
- questionable practices in web customer service (they boast an online chat service and a chatbot yet their US website lacks local service phone numbers – offered are only call center numbers for Brazil, Chile, Colombia)
- uncompetitive e-sales & distribution policies (for example offering the same fare levels on OTAs as on their own website).

Essentially, Avianca Brazil should consider a comprehensive review of its current web presence and swifty implement improvements where necessary.

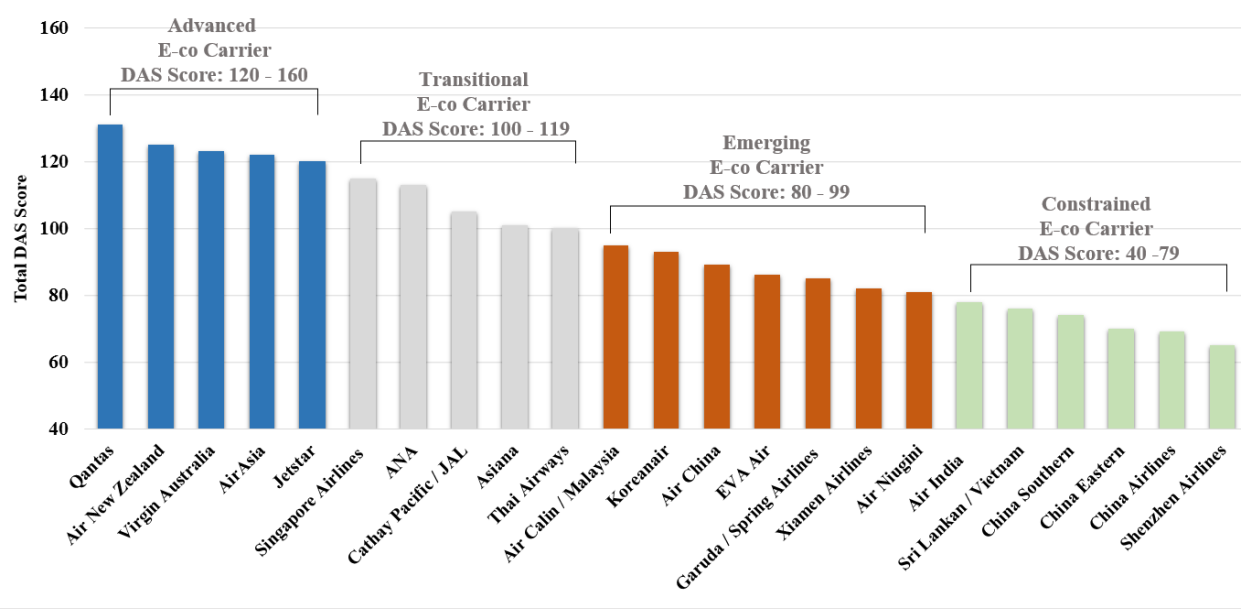
2. Asia Pacific

Leading carriers in this regional group are clustered in Australia and New Zealand (Figure 7). Somewhat closely following are Asian carriers Singapore Airlines and JAL from the transitional e-commerce category. They certainly have the potential of joining the top e-commerce category assuming that they become more competitive in a number of areas. For example, Singapore would need to improve its web customer service while JAL should remedy several deficiencies in e-sales & distribution, among other areas.

The Asia Pacific region occupies the largest share of digitally less capable carriers. Government-owned Air

India, Sri Lankan, and Vietnam Airlines are among them. Airlines from mainland China - Shenzhen, China Eastern, and China Southern and to a certain extent Xiamen Airlines and Spring Airlines – collectively have serious shortcomings in every single digital area. The much talked about digital ascendancy of China has yet to materialize with these carriers. Unless the affected companies' senior leadership is committed to act quickly, invest in new technology and talent, and implement new business practices - all critical ingredients to achieve and sustain digital competitiveness, it is difficult to imagine that these carriers will ever catch up with e-commerce leaders. They face a growing challenge to retain existing business and revenue streams, never mind attracting new, higher yielding travelers.

Figure 7: Level of E-commerce Advancement among Asia Pacific Carriers



3. Europe

Europe contains the largest share of transitional airlines, in a way positioning this region to be possibly the "hotbed" of digital transformation if players in this category continue their ongoing, strong cyberspace engagement. On the downside, our assessment shows that European carriers across the board could do better in digital data privacy and web customer service. Improving these two areas would increase the DAS of several companies that are on the cusp of breaking into the top e-commerce category. These include FSCs Finnair, Austrian, Lufthansa, Air France, and Swiss. For LCAs, they are easyJet and Norwegian (the best performing LCAs from Europe). For all other European airlines, improvements are critical in a wider range of online areas, arguably a more challenging undertaking. Nevertheless, the sum effect of these incremental digital upgrades is a significantly more competitive position in the marketplace. European carriers currently in the constrained e-commerce category such as Aegean, Russian S7, Adria, and Tarom have the most work ahead of them. Budget improvements, expansion of the e-commerce talent base, and higher placement of digital issues on the corporate agenda would all help shift gears in the right direction.

4. Middle East & Africa

The Middle East/Africa region is currently void of companies in the advance e-commerce category although two aspirants – Emirates and Qatar – display strong digital competencies as transitional e-commerce carriers. The bulk of this region's airlines is much less advanced and displays weaknesses in numerous areas. Most players fall into the emerging e-commerce category which includes airline brands South African Airways, Saudia, Royal Jordanian, and EgyptAir. Carriers in this category suffer from multiple deficiencies including but not limited to:

- digital presence (too small platform range, uncompetitive website features)
- web customer service (too few service options, weak integration of service tools)
- e-sales & distribution (low ancillary revenue, small number/no direct connection relationships)
- online advertising & promotion (limited range, low communication frequency, lack of personalized messaging)

Ethiopian Airlines shares all of these above shortcomings but also lacks a privacy policy (Iran Air is the only other carrier in the entire survey not providing for any information on the handling of travelers' digital data), hence their placement in the constrained e-commerce category. Iranair's low DAS rank puts the carrier at the tail end in this region (and all other regions for that matter) but it is reasonable to believe if the company had more and better access to digital travel technology, know how, and best practices, it would improve its performance in cyberspace substantially over time.

C. Airline Business Model

Are (ultra)low-cost airlines more competitive in cyberspace than full-service carriers? A few years ago, the answer to this question would have been a resounding 'yes'. Historical reasons certainly play into this. (U)LCAs were largely born during/after the emergence of the commercial internet in the mid-1990s enabling them to adopt early on new, direct-to-consumer online business models. The world's largest LCA, Southwest Airlines, although they had already been in business since 1967, quickly switched to online and made it their core for marketing, sales, and service, showcases this development. They pioneered a number of cyberspace "firsts" including:

- the world's first official airline website (1995)
- first airline blog site "Nuts about Southwest (2006)
- first airline on Facebook (2007)
- first mobile app (2008)

Traditional legacy carriers on the other hand faced - and still do today - a variety of challenges to undo past analog business practices and merge them with digital. Thus their cyberspace engagement has always had a more complex dimension. Channel conflicts with intermediaries such as travel agencies and GDSs and less nimble corporate cultures are some examples of this.

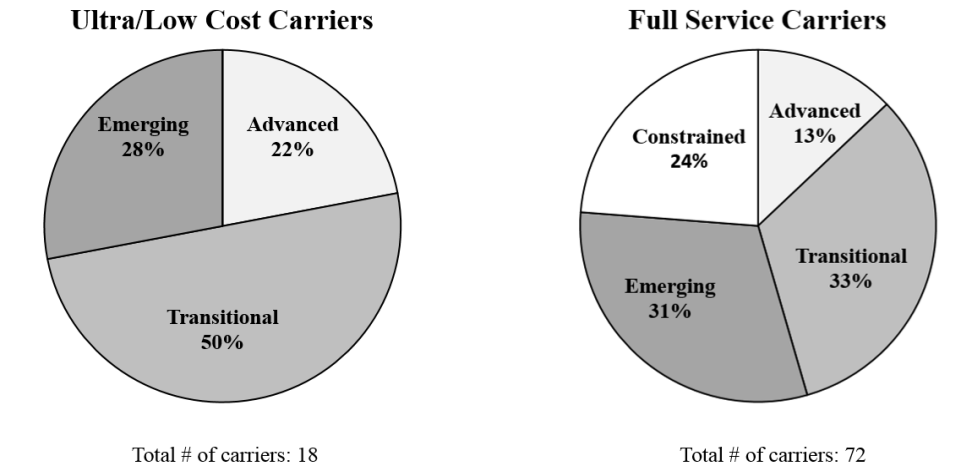
In recent years, however, many FSCs have managed to catch up or have even surpassed (U)LCAs in their digital capabilities. In our survey, 9 of the 13 airlines assessed as "advanced e-commerce carriers" are legacy FSCs. Among them are American Airlines, KLM, Alaska Airlines, and Qantas that have emerged as highly prominent competitors in cyberspace due to their constant push to introduce new standards/practices and perform at a top level across a wide spectrum of digital areas. They are all ahead of JetBlue, the best performing (U)LCA.

When assessing the two groups on a standalone basis and looking through the lense of relative size they occupy in each of the four e-commerce categories, it is clear that (U)LCAs outperform their peers from the

full service side (Figure 8). This picture highlights how digitally competitive (U)LCAs generally are.

Since (U)LCAs claim a growing share of worldwide traffic and tend to be digitally more competent, FSCs would be well advised to continue monitoring what these rivals are up to, adopting some of their practices where suitable, and possibly even joining forces with them. Interestingly, none of the three airline alliances we have discussed earlier have currently a single (U)LCA in their group.

Figure 8: The Digital Airline Score (DAS) – Ultra/Low Cost Carriers vs Full Service Carriers



How do Ultra/Low Cost Carriers stack up?

Advanced Eco-Carrier

JetBlue, Air Asia, Southwest, Jetstar

Transitional E-co Carrier

easyJet, Norwegian, Transavia, Eurowings, Frontier, Ryanair, Vueling, Volaris, Wizz

Emerging E-co Carrier

Kulula, Pegasus, Air Arabia, Fastjet, Spring Airlines

D. Digital Data Privacy

This is the weakest area for almost all carriers. SkaiBlu examined the airlines' website privacy policies against the so-called FIPs (Fair Information Practices). These are internationally recognized practices that address privacy information of individuals. Specifically, assessed were the four areas of:

- timeliness of privacy policies
- privacy policies' transparency
- customer control over their information
- responsiveness of companies to privacy related queries

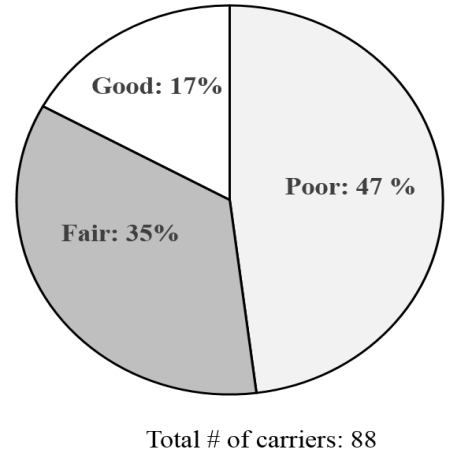
In all these areas, almost all carriers revealed serious deficiencies.

On the issue of timeliness, most carriers' website privacy policies are either out of date (3-4 years old) or do not feature a timestamp at all. Considering the numerous legislative changes for data privacy in many countries, the vast majority of carriers do not appear as current as they should be in this area. The situation is rather different with Air New Zealand: At the very beginning of their website privacy policy, they prominently feature a timestamp when their privacy policy was last updated (May 8 2017). Also, they invite website users to check occasionally if any updates have occurred as a result of legal changes. This approach is a good example that should be followed by more carriers. Interestingly, the carrier even shows a YouTube video hosted by a flight attendant who outlines the carrier's perspective on data privacy ("Think Privacy & Do the Right Thing"). easyJet is another carrier featuring a video about its privacy policy. This is a welcome take on a subject that can quickly become too "inhumane" due to its legalistic nature

In the area of digital data transparency, all airlines can do better (Figure 9). The language used in website privacy sections is often convoluted, if not too legalese, and the information presented is too much. For example, United Airlines' privacy policy contains over 5,300 words, not including the privacy policy of

other United brands such as United Vacations and United Cruise. This is difficult to handle for an average web user, although the other extreme is not helpful either. In the case of Middle East Airlines, their privacy policy features a mere 177 words and is on record in our survey for one of the smallest and least insightful sources on digital data handling. Furthermore, while information on data collection sources and purposes are relatively clear with many airlines, meaningful disclosures on data storage locations (mentioned occasionally are "other countries"), data retention periods ("as long as necessary"), and third party data handlers ("legal authorities", "external service providers") are unfortunately not provided. This is not necessarily an approach for building trust with online users. Air Canada, British Airways, and Emirates are among the few airlines with a better than average performance in this area and may serve as a guide to those carriers seeking improvement. There might be a time in the not too distant future where the treatment of data privacy, unlike today, could become a competitive differentiator and an airline could capitalize on being the privacy friendlier company in the market place. Notwithstanding national privacy laws, the airline industry overall should and can do better in terms of featuring information on digital data management that is more uniform, easy-to-digest, and useful.

Figure 9: Level of Transparency in Airlines' Digital Data Privacy



Room for improvement:

- ***No carrier earned an "Excellent" DAS rating***
- ***Only 15 airlines were "Good" and included American Airlines, Air Asia, Air Canada, Air New Zealand, Alaska, British Airways, Cathay, Emirates, Etihad, Finnair, JetBlue, Kenya Airways, Koreanair, Singapore, United Airlines***
- ***Ethiopian Airlines & Iran Air did not feature any information on their data privacy handling***

When it comes to the FIP area of customer control, on the positive side, most airlines grant access to the data they hold so that travelers can review and/or correct them. A number of carriers including EgyptAir, SAA, and Saudia are silent on this policy. Noteworthy is that some airlines state that they actually may levy a fee for this service. LCAs like Ryanair can be "excused" for this in light of their business model to monetize services offered. However, it was a surprise to see that full service carriers like Emirates and Etihad were among them. If there was a choice between no access and access for a fee, certainly the latter is preferable. Nevertheless, a fee-based approach suggests an anti-consumer policy in terms of data privacy management.

Airlines allow travelers to indicate if they consent to receiving marketing, sales, and flight operational information either from the airline itself or from its partners. This is an important piece of protection and control over the travelers' data. Many carriers in the survey appear to pursue an opt-in policy whereby travelers receive communication by default. This translates to a lower degree of protection for travelers but still furnishes them with some control. In this instance, travelers have to be pro-active in notifying the carrier to indicate that they do not want to receive certain types of communication. Opt-in/Opt-out selections are also relevant for travelers in the context of website tracking technologies, particularly cookie applications that are used by airlines. Most airlines apply these and in all instances, the default setting is for "opt-in". In other words, it is assumed that a traveler agrees to being tracked. Justification for this approach is the supposedly better, more personalized delivery of offerings to travelers. However, as a growing number of privacy advocates points out, if

these offerings are indeed so good, why not let travelers decide for themselves if they want to opt in? Fact is that if a web user prefers not being tracked, it is generally not easy to opt out. Most airlines share no information at all on how to do this while some provide for links to generic third party sites like allaboutcookies.org. Only a small number of airlines including Air France and American feature specific opt-out choices.

The final area assessed for digital data privacy dealt with the responsiveness of carriers to privacy policy queries. With a few exceptions, the responsiveness of airlines to privacy policy queries was poor. Out of the total of 90 carriers contacted via email, 38 did not respond at all including those airlines such as Air Canada and Lufthansa touting a dedicated data protection manager and dedicated email address for queries. Of the remaining airlines that did respond, most provided generic information and referred back to their website (where the answers are actually not available) as opposed to answering the specific privacy questions asked. Some airlines took their time in replying – Air Asia holds a record in our survey with 57 days, followed by Qantas with 27 days - while others like Cathay Pacific were swift and provided feedback within 24 hours. Oddly enough, a few airlines returned an email and requested to be called back for sharing additional information (British Airways and Alitalia were among them). The top performers earning the highest score in this area for their outstanding performance because of their quick turnaround and superior quality of feedback were Alaska Airlines, Air New Zealand, and COPA.

Our assessment indicates that most carriers have a number of deficiencies in the area of digital data privacy. This situation does not bode well for the data intensive airline business in light of data privacy legislation becoming ever stricter around the world. A case in point is the EU where a new ePrivacy Regulation becomes effective in May 2018. Fines of up to 4% of global revenue and the reporting of data breaches within 72 hours are parts of the new data privacy regime. Moving forward, carriers will have to undertake substantial adjustments in how they manage this area and communicate about it – both the travelling public and legislators will demand it.

D. Web Customer Service

After digital privacy, web customer service is the second weakest area for all carriers in the survey. Our analysis has revealed significant gaps in carriers' capabilities. In essence, this shows what is already a known fact for airlines in the offline world: The delivery of good customer service is not easy but those that excel at it can truly differentiate themselves from rivals. Prompt responses and consistent information, delivered by skilled employees and customer self-service tools that take into account who the traveler actually is and what their situation is for a more personalized and contextualized support are all part of "good" customer service.

Airlines today have so much more insight from their ever growing digital data collection activities on travelers, yet numerous industry surveys show how low customer satisfaction levels still score. There are several reasons for this poor state of affairs: Multiple and disconnected airline databases, organizational siloes that prevent critical data sharing, lack of proper IT infrastructure, inadequate inhouse analytics talent, and maybe also the still underlying approach of the industry to view its business through the lense of a logistics company as opposed to that of a customer service company. A case in point, even though an extreme one, was the violent removal of passenger David Dao from an overbooked United Airlines flight last year. This was an interaction based on customer data that factored in his degree of FFP loyalty and ticket price paid to accommodate an on-duty United flight crew who had to travel to another location.

Out of the total maximum score of 32 possible for web customer service, the highest score earned by any carrier was a DAS of 28 by Virgin Australia. Finnair, Qantas, and United were next and scored a DAS of 26 each. On the low end of the spectrum with a DAS of 8, we find airlines with a poor performance record in web customer service. These include Adria Airways and China Eastern.

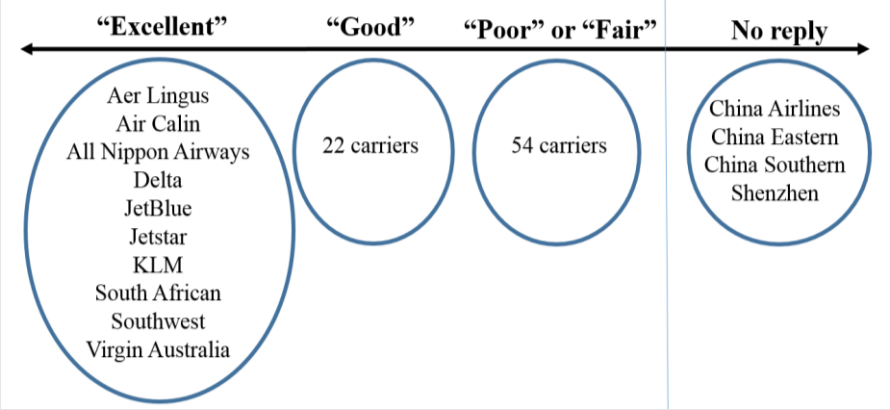
The large majority of airlines offers a less than sufficient range of online service options. Particularly, common self-service tools such as FAQ sections and site search were often missing. Interestingly, even when self-service tools are available, most carriers do not appear to take advantage of their relatively lower costs (self-service costs $0.10 or less per customer contact while phone support ranges between $6 and $12) and present them more prominently. Essentially, the websites in these cases typically feature both self-service and assisted service options somewhat randomly. An example of this situation is Romanian carrier Tarom whose website tarom.ro shows the carrier's customer contact phone number next to their site search tool.

Advanced e-commerce carriers have a different approach vis-à-vis customer service. They offer a wide range of different service options. They do this because they know that travelers often bounce back and forth between numerous channels in order to resolve their issue. Also, they know that customers from different age groups have different preferences when it comes to certain service options. Offering a wide range thus allows an airline to fulfill the needs of a larger audience. At the same time, e-commerce savvy airlines are also cost conscious when it comes to web customer service. They prioritize low-cost self-service options over higher, customer-assisted, service cost options. For example, instead of featuring a toll-free phone number on the homepage, these carriers encourage web travelers to use self-service options first before escalating to email, chat, or phone. This approach is supported by clever web design and "penalties" in the form of surcharges that are occasionally levied on travelers if they engage a customer service representative.

Another aspect looked for in scoring web customer service was the degree of integration among the different service options. Customers dislike nothing more than disconnected service channels that not only make the transition between them a challenge but also require them to share their service issue multiple times over. For instance, by the time a web traveler contacts an airline via phone, the customer service representative very likely has no idea that the traveler might have already tried to self-help on the carrier's website or received assistance via social media from other customers. Making transitions among different service channels more seamless and carrying over content from one service channel to another provide an improved customer experience and makes better use of corporate resources. With the exception of British Airways, no airline excelled in this area; among the few earning a "good" DAS rating were Alaska, Kenya Airways, Qantas TAP, Virgin Atlantic, and Virgin Australia.

A lack of responsiveness to customer service queries contributed to the sub-par performance in this category. Specifically, SkaiBlu assessed both the speed and quality of carriers' replies to queries submitted via email, social media, and a site search tool when available. Companies without any response to our queries included several mainland China carriers (Figure 10).

Figure 10: Quality in Web Customer Service Responsiveness



On the other hand, All Nippon Airways and Virgin Australia were among those earning a top score because they replied to email and Twitter queries fast and accurately while their sites search tools handled submitted key terms very well. Nevertheless, over 50 carriers in the sample either scored "Poor" or "Fair", a clear sign that the vast majority should improve their current web customer service levels.

E. Digital Brand Appearance & Protection

Based on our assessment, digital brand appearance & protection also offers several opportunities for improvement. As part of the DAS methodology for this area, we specifically reviewed the quality of web content, website design, domain name portfolio, and legal notice. A more detailed discussion on the first two follows below.

1. Website Content

Overall, most carriers offer travelers appealing website content in order to support their digital marketing, sales, and customer service activities. Nevertheless, many companies should take a closer look at the content management process of their digital properties. Out of date content such the copyright stamp on the Thai Airways website from 2014 or the pre-Christmas fare special still offered in January on SriLankan.com are outlier examples but indicative of a lack of quality control at an airline. This also goes for misspellings, wrong grammar use, and awkward/incorrect language translations, frequently observed even with top quality carriers. Language mixes on a single site (Eva Air's French language site with all its English content is an illustrative case) and substandard imagery are also often encountered. "Content is king" when it attracts rather than disrupts and it centers around customers as opposed to itself. Therefore, while these issues may seem superficial for some observers, they degrade the quality of interaction with travelers and also hint at a level of professionalism (or the lack thereof) and sincerity in terms of how seriously an airline manages e-commerce.

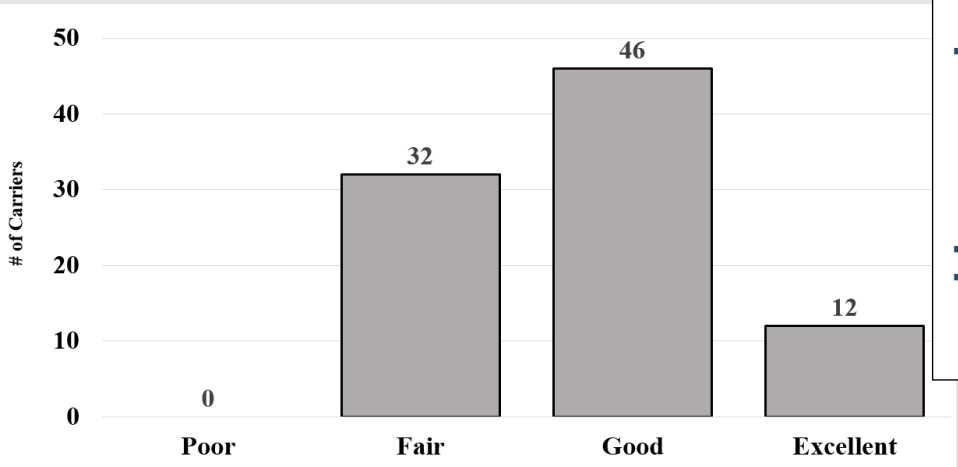
Content deficiencies as described above need to be addressed through well-defined content management policies, adequate resources, and clear content ownership guidelines. For example, rather than assigning airline employees (often from a local marketing or sales office with native language skills) to translate/edit the content themselves when time permits, it is advisable to involve professional translation companies and possibly full-time inhouse editors who have the know how to effectively wordsmith content for an online audience. Furthermore, departments that own significant content on a carrier's site – the frequent flyer department is an example – should consider appointing a full-time web champion to ensure that "their" content is properly managed.

The task of managing digital properties is not getting easier for airlines: As they continue adding more and more information to their websites (fueled lately by the industry's merchandising activities), content becomes larger and more complex. It is not unusual to see a carrier's website encompassing several hundred if not thousands of webpages. This development poses a growing challenge for all airlines in cyberspace but the ones already experiencing content shortcomings today will need to step up their engagement in this area if they want to avoid triggering brand trust issue with travelers.

2. Website Design

The impression a site makes is inherently subjective due to a user's physical attributes, cultural context, age, and even gender, but there are base factors crucially important for creating a positive user experience. The good news is that none of the airline websites reviewed for the quality of their design fared poorly. Nevertheless, 32 companies or slightly more than one third of the 90 carriers are in need of improving their website design. Additionally, even the 46 airlines which earned a "Good" rating show deficiencies that could morph into larger issues over time if not adequately managed in the near future.

Figure 11: Quality of Airline Website Design



Principal site design deficiencies:

- ***Visual presentation often suffering from informational overload and cluttered web pages***
- ***Navigational inefficiencies due to high number of clicks to complete online tasks, limited shoppers' situational awareness, missing web site authentication, lack of connectivity between mobile and desktop devices***
- ***Lack of responsive web design***
- ***Accessibility for disabled web users generally sub-optimal and in some cases completely missing***

Examples of the areas that most airlines should pay attention to for improvement are related to visual presentation and navigational efficiency. Many carriers overload their websites with too much information, especially on the homepage, typically the first stop for online shoppers. The result is cluttered real estate that makes it challenging for users to find what they are looking for. Aeroflot's and ANA's websites fall into this group where it takes a significant effort to fully explore their website homepages. This situation is likely to be further exacerbated as a growing number of airlines are behaving like retailers that are known to "spam" their target audience with (too) much information. Interestingly, (U)LCAs, generally considered leaders in digital retailing increasingly pursue a "less is more" approach. Their websites, take Norwegian.com as an example, are more airy and minimalistic in design, emphasizing a clean and simple look & feel. The downside of this approach is that it could involve more page scrolling. Successful design is about trade-offs between white space and efficiency, smart airlines conduct A/B tests to find the right balance (airnewzealand.com is an excellent example of this right balance).

In terms of navigational efficiencies, many carriers could do a better job to streamline the interaction with a web site and minimize the number of clicks it takes to complete the key task of purchasing a ticket. Examples of helpful features to auto-populate website entry fields that otherwise need to be (re-)filled one at a time:

- Situational awareness of a traveler via geo location

- remembering a user's last search when a website is revisited
- website authentication through online registration enabling the use of a traveler's stored profile information
- better connectivity between mobile and desktop devices for carrying over content

For secondary tasks such as check-in or flight status, our observations show that carriers generally offer good solutions. Take for instance Alaskaair.com featuring a single horizontal navigation bar with "Check-in", "Flight Status", and "Manage" in bolded text. Contrasting this with Emirates.com where one finds both horizontal and vertical navigation bars with a lack of differentiation and information blended together. In their case, a user has to slowly and deliberately read every label to ensure that the right item is found.

Another aspect of website design deals with mobile strategy. Similar to how the internet handles mobile users as a whole, our sample of airlines reflects of what is going on: Some carriers maintain separate mobile sites and/or mobile apps, others have fully or partially responsive websites, and a few do not do anything. In SkaiBlu's ranking methodology for DAS, airlines earn a higher score for fully responsive websites. This is because maintaining websites for different devices is costly and Google also gives preferred ranking results to responsive websites. Overall, carriers performed well in this area with the vast majority using fully responsive sites and a few directing users to their mobile websites.

Nevertheless, there were some awkward observations. For instance, Aer Lingus makes it mandatory to download its app when accessing them through a smart phone or tablet while SAS only offers a link to its full desktop site. Both carriers may want to adopt a more user friendly approach and either launch a separate mobile site or adopt a fully responsive design moving forward. Among some of the Chinese carriers, the picture is anything but consistent: For example, Xiamen Airlines' links to its mobile property were constantly broken while Shenzhen Airlines' global site for customers outside China only offers a full desktop site (its site for domestic China is responsive).

Part of our assessment on the quality of website design also evaluated website accessibility for disabled users. As carriers have moved more services online, equal access to users experiencing auditory, cognitive, tactile, and visual disabilities has become crucial. According to Worldbank data from 2017, over 1 billion people or 15% of the world population experience some form of disability (if one accounts for extended family members, well over 2 billion people are directly affected). Against this background, SkaiBlu views that in today's modern society, making travel accessible for disabled users is first and foremost a social responsibility.

Meanwhile, a growing number of countries have adopted (or are in the process of doing so) legislative frameworks to handle this issue. In the US, for example, the US Department of Transport announced in November 2013 that the Air Carriers Access Act of 1986 that prohibits the discrimination by US and foreign carriers on the basis of mental and physical disabilities would apply to websites as well. Accordingly, by December 2016, web pages were supposed to be compliant with the widely accepted Web Content Accessibility Guidelines (WCAGs), Level AA. Government agencies of the EU and other countries including Australia, Canada, and New Zealand have already adopted this standard some time ago and the business sector will increasingly be also subjected to WCAG compliance in the next few years in those countries.

Several airlines have made great modifications to their websites in this regard (British Airways and Delta Airlines are examples). However, still far too many of the airline sites checked have shortcomings. Key items for better web accessibility include:

- full keyboard access for non-sighted and limited mobility users
- better color contrast for travelers with limited eye vision/color blindness
- alternative content with text/transcripts
- captions as substitutes for imagery and other online media

Web accessibility is here to stay with the next legislative wave – accessibility for mobile devices – already in the wings. Accessibility is law and carriers not fully prepared yet for making it an integral part of their web presence risk financial penalties, temporary website shutdowns, and negative PR.

V. Summary of DAS Assessment Main Findings

Digital Attribute	Proxy Indicator	Overall Assessment
Fundamental Attribute		
Digital Data Privacy		**Worldwide and especially in the EU, digital data privacy legislation is becoming increasingly stricter, yet this area is among the weakest for the vast majority of airlines. Air New Zealand is the leader applying best-in class privacy policy practices.**
	Timeliness	Most carriers' privacy policies are out of date (3-4 years old) or feature no timestamp at all.
	Transparency	Generally vague with little/no information on data retention periods, storage locations, tracking mechanisms. Also, only a few advise what happens to personal data in a merger or bankruptcy.
	Customer Control	Offered by most airlines although some levy fee for data access; "opt-in" for tracking is typical default while "opt-out" process is cumbersome.
	Query Responsiveness	Dismal responsiveness in terms of accuracy and timeliness, even with carriers that feature a dedicated digital privacy contact.
Digital Performance		**Generally good performance but carriers need to stay focused on speeding up their mobile properties and ensure a 100% uptime to cover flight disruptions**
	Desktop site download speed	Most carriers' download speed is competitive at or below 4 seconds.
	Mobile site download speed	Most carriers' mobile speed slow, ranging between 2 and 4 seconds; some including Alitalia, Air India, Oman Air, and South African take more than 6 seconds.
	Desktop site uptime	Not 100% for all carriers, some showing 99% and a few even 98% uptime.
	Mobile site uptime	Not 100% for all carriers, some showing 99% and a few even 98% uptime.
Digital Properties & Features		**Most airlines perform at acceptable level but could improve their cyberspace presence with wider platform range and better connectivity among multiple devices, enhancement of basic website features, and quality improvement of global web presence.**
	Platform range	Standard platforms with desktop, mobile, and social media by all carriers; inflight wifi connectivity spotty but deployment growing across fleets, especially longhaul aircraft. Emerging platforms with wearable computing, virtual reality, and IoT currently clustered around digitally highly competent, larger carriers. Inflight engagement (meal ordering, entertainment, etc) via travelers' devices is still in infancy.
	Website types	Some carriers lead this area with "website families" featuring corporate blogs, embedded microsites or separate sites for FFP, vacation program, cargo, and even charity foundation. BA is one example.
	Website features	Standard features by all carriers; desirable is the launch/introduction of more alternative forms of payments, seamless multi-device shopping between desktop and mobile, enhanced destination/airport information, more self-service features (eg instant online refunds/exchanges).
	Globalization	Overall acceptable with country specific sites offered by most airlines but localization of content (eg local news, image use of Asians vs Caucasians, local forms of payment and currency quotes, local customer support) could be better.
Digital Brand Appearance & Protection		**Overall good but need to improve non-English sites, accessibility for disabled web users, and control over domain names that could damage airline brand (eg. "evaairsucks.com").**
	Website content quality	Generally good but with some grammar and misspellings, particularly on non-English language sites, expired fare promotions, and fuzzy/distorted images.
	Website design	Generally acceptable. Main challenges are with visual presentation and navigational efficiency. Cluttered website with too much content, high number of clicks for task completion, limited shopper's situational awareness, missing web authentication and disjointed connectivity between mobile and desktop, lacking responsive website design are contributing factors. Better accessibility for disabled users remains an issue.
	Domain Name Portfolio	Most carriers use .com for their brands and subbrands (eg FFPs, vacation programs) but need to better manage their domain name portfolios. Missing are often localized domains (eg. .co.uk), domains for subbrands (eg for FFPs) and English language anti-brand domains ("Ihateairline.com", "airlinesucks.com").
	Legal Notice Terms of Use	Most all carriers have well defined legal notices/terms of use on their website. Intellectual property (IP) rights related to an airline's digital properties, liability protection against possible site content inaccuracies, and disclaimers regarding third party websites are clear. A handful of carriers do not feature legal notices/terms of use on their website and are therefore exposed to possible IP infringements and liabilities: China Southern, Czech Airlines, Ethiopian, S7, and Tarom.

Digital Attribute	Proxy Indicator	Overall Assessment
Differentiator Attribute		
Web Customer Service		**Web customer service is the second weakest performing area after digital privacy. Leaders include Virgin Australia, Finnair, and Qantas.**
	Service Options	Almost all carriers offer standard range of options (phone, email, site search, FAQ, social care), Chatbot assistance is on the rise (eg Austrian, Lufthansa, KLM). Best-in class is Finnair offering widest spectrum including online chat, chatbot, "how-to" demos, social, and others.
	Service Efficiency	Best tiered approach and accounting for low-cost self-service options vs high-cost assisted options are Virgin Australia, Aeromexico, Finnair, Qantas, and United. Among (U)LCAs, easyJet, Eurowings, Norwegian, and Wizz are the leaders.
	Service Channel Integration	Generally, transition between different service options is inconsistent and not seamless; even highly advanced digital carriers need to improve more in this area for a better customer experience.
	Service Responsiveness	Except for Aer Lingus, Jetstar, KLM, SAA, and Virgin Australia, responsiveness across email, social media and site self-service tools is poor with most airlines.
E-sales & Distribution		**Increasing use of direct distribution by full service carriers (FSCs), led by American, BA, Iberia, and the Lufthansa Group. LCCs lead ancillary sales.**
	Channel Pricing	Most carriers offer lowest fares on their own websites, some have better fares via OTAs or their call centers; low fare guarantee only available by a few.
	Ancillaries	(U)LCAs with Air Asia, easyJet, Frontier, Ryanair, and Wizz lead ancillary sales; Air Canada, American, Alaska, Delta and United are top performers among the full service carriers (FSCs).
	Range of E-sales & Distribution	Most airlines participate in all major OTAs and meta search engines; range is becoming wider with (U)LCAs tapping increasingly into the corporate travel market and FSCs becoming more engaged in price sensitive travel segments. Selected carriers including Air Canada, British Airways, Iberia, the Lufthansa Group, and Vueling have also started participating in newly emerging e-sales & distribution platforms such as "Flyiin". KLM is leader in social media sales, having become the first non-Chinese airline to pay for tickets and ancillaries via WeChat.
	Direct Distribution	Led by American, BA, Iberia, and Lufthansa Group who have initiated direct booking programs. More carriers are also participating in the IATA NDC program to overcome distribution gaps between their own channels and 3rd party travel outlets.
Online Marketing		**Top performing airline is Qantas followed by six carriers each achieving the same score (Alaska, Emirates, Lufthansa, KLM, Qatar, and United) in this area. Many carriers are relatively little differentiated among each other; any significant personalization is still elusive with almost all carriers.**
	Range of Digital Media Formats	Majority of airlines use standard spectrum of digital media formats (search, display, social, email); growing in popularity are programmatic advertising, social media influencers, and advergaming but only a few airlines appear to use them so far.
	Communication Frequency	For email newsletters and social media posts, only a few are best-in class (Alaska, Aeromexico, Emirates, Qantas, United) with Air Asia and Frontier being most prolific among (U)LCAs. Many carriers should increase their communication frequency to be in line with best practices (1-2 email newsletter/week, social media posts >30-40/month).
	Optimization for Digital Platform	Generally good with all carriers although some airlines could improve optimization for search marketing (including with non-Google players Baidu, Naver, and Yandex) and email marketing.
	Communication Message	Most airlines offer generic messages with (U)LCAs focusing almost exclusively on fare promotions while FSCs also frequently highlight product and services. Communication with personalized content is only provided by a few companies including Air New Zealand, Emirates, Qantas, and Qatar.

VI. Moving Forward

Airlines seeking to advance their e-commerce adoption and use need to have a good understanding of where their digital strengths and weaknesses are. In terms of DAS, this means taking a closer look at the company's performance in the fundamental and differentiator areas of e-commerce.

A. Elevation of e-commerce on the corporate agenda

This is first and foremost an action item for carriers that are e-commerce constrained. They have significant deficiencies across all relevant areas and the development of an overall framework for e-commerce is essential. In order to become more effective digital players, each of them has to elevate e-commerce on the corporate agenda. Importantly, both the involvement and the oversight of senior management are critical. If leaders at these airlines do not take ownership of e-commerce, it will continue being managed as a by-product with non-aligned stakeholders who pursue their own e-commerce agenda for the company. Leaders at these airlines have to view e-commerce as an opportunity that creates benefits for both the company and customers alike.

There are several immediate steps that constrained e-commerce carriers must address:

- providing additional funds and recruiting e-commerce knowhow
- improving the current web presence by overhauling website design, repurposing existing website content, and introducing industry standard website features
- integrating a "mobile" perspective for all digital properties

Changes like these are instantly visible to customers, who will have a better online experience when using the carrier's digital properties. Only when an airline has successfully managed these fundamental issues should an orientation toward the differentiator factors in sales, marketing, and customer service be considered.

Our assessment has shown that there is room for improvement for all carriers. The question is what needs to be done and how it should be done. Depending on how advanced a carrier is in e-commerce, decision makers at airlines should focus on a few key imperatives.

B. Introducing better governance and organizational structures

A sub-optimal e-commerce performance is often a reflection of poor organizational processes and structures. This is particularly an issue with emerging e-commerce carriers. As a result, a number of crucial digital areas that should receive utmost attention are improperly managed, possibly neglected, or do not even register on the corporate e-commerce agenda. Common issues of this situation include:

- Limited digital platform presence (limited if any IoT/virtual reality/wearable computing applications/inflight wifi)
- Poor digital brand appearance (weak digital content and design, small domain name portfolio)
- Sub-par e-marketing (lack of e-marketing venues such as programmatic advertising, weak search engine participation, low communication frequency)
- Weak e-sales & distribution (limited up/cross sell ancillaries & direct distribution relationships, inconsistency in online pricing across distribution outlets)
- Uncompetitive web customer service (slow responsiveness, limited selection of service tools, often too costly)

Carriers from the emerging e-commerce group that aim at closing the gap on these essential weaknesses will need to organize their digital transformation better. The assessment and implementation involved in this process takes time (6–12 months). Effective collaboration among stakeholders at the airline and outside companies and efficient decision-making processes are examples of what needs to be achieved. Furthermore, recruitment of e-commerce talent, clear organizational roles and responsibilities (no mismatch

between authority and responsibilities), and senior level leadership are also important.

C. Adopting an ecosystem perspective on e-commerce is vital to success in cyberspace

This requires an airline to engage in multiple e-commerce areas at the same time— only feasible if a carrier acknowledges the convergence among and between fundamental and differentiator e-commerce factors.

For example, advanced e-commerce airlines do not view mobile platforms in isolation from desktops (or other platforms in the digital eco system). Crucially, there is no discernible disconnect between the "e" and "commerce." IT, e-marketing, e-sales and distribution, and web customer service are viewed as part of the same equation. Advanced e-commerce carriers manage the different "e" and "commerce" components so that they complement and reinforce in each other. They also ask "How can we do this online?" and "What is the impact on other components and stakeholders?" Travelers benefit from this holistic approach in the form of better e-commerce products and a more integrated and consistent online experience.

Less advanced e-commerce carriers often struggle with transcending siloes and approaching e-commerce as a coherent ecosystem. This is particularly the case when dealing with the differentiator factors applicable to e-sales and distribution, online advertising and promotion, and web customer service. They are arguably more challenging to manage than fundamental e-commerce aspects such as a website's speed and uptime reliability. Nevertheless, these issues need to be tackled if an airline wants to rise above its current level of performance and strengthen its competitive standing in cyberspace.

VII. Closing Comments

After 22 years, when the airline industry embarked on its digital journey, there is still plenty of room for improvement in the digital transformation of all carriers. The majority of airlines evaluated for our benchmark report is still not able to compete effectively in cyberspace, nor to fully reap the rewards available. Even American Airlines as the top performer with a DAS of 136 has some distance to cover before closing in on the maximum score of 160. Importantly, there is no magic silver bullet to succeed in this area. As we have pointed out before, a carrier needs to establish a whole range of e-commerce related goals and pursue their achievement in tandem via multiple action items if an overall improvement in digital competitiveness is on the corporate agenda. This has to be an ongoing process if the digital transformation of a carrier is intended to be sustainable.

Furthermore, as previously acknowledged, an assessment of an airline's level of digital competitiveness is ultimately a subjective process. Nevertheless, a tool such as DAS allows an insight into the gaps in an airline's adoption and use of e-commerce. The insight shared in our discussion may serve as a wake-up call.

Companies that fall into the constrained or emerging categories are well advised to at least initiate an analysis of their current situation, to look at market best practice, and determine what is going on and what needs to be done. These are essential steps when devising a sound strategy for a digital transformation.

Even when airlines have scored well with DAS and are categorized as advanced (or close to being advanced) because they are doing a lot of things better than the rest, the question is for how long. This field, increasingly driven by consumers and unpredictable market conditions, is constantly and rapidly changing. There can be no room for complacency and business strategy models require a new, higher level of improvisation.

The internet is becoming more immersive and pervasive every day. For example, travelers so far have experienced the internet through a few devices and the browsers they support. This is about to change. Supported by artificial intelligence (AI) and big data, the internet of things (IoT) will be the next major physical layer of connected devices. Estimates on their number range between 20 and 30 billion by 2020 – whatever the correct figure turns out to be, we will see soon more communication between devices than between people.

Today's empowered consumers are frequently much more proficient – and demanding – in cyberspace than airlines. Millennials and members of generation Z who do not know life without the internet will significantly shape tomorrow's demand for travel. What will be the impact on the online travel market place and what digital offerings does a carrier need in order to stay competitive? It is vital for airlines to adopt a mentality that recognizes the opportunities – and potential threats – in dealing with travelers in cyberspace. The best e-commerce airline practitioners will always be in a catch-up mode as the periods of relative market stability shrink constantly. Thus, a true breakout strategy, for example via personalization, may always remain elusive for even the best of airlines.

Nevertheless, the key is to be prepared for the transitions ahead. Improving its digitalness is a corporate imperative for any airline, while regularly conducting internal audits to assess its core competencies in the area.

A DAS-based approach should be conducted at least once a year along the lines set out in our earlier discussion offers one way to evaluate an airline's position and those of its competitors. As necessary, strategic directions for the digital transformation can then be constantly adjusted. No one will "get it right", but an important start is at least to recognize fully the importance of this activity and to put in place the necessary structures to apply best practice – and even eventually to create it. With this approach, an airline is best positioned to move from a current status quo to a possible breakout area ahead of competitors.

For further information on this report, please contact Dr. Michael Hanke, Founder & Managing Director, mh@kaiblu.com.