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Travel and logistics: data drives the race for customers

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Introduction and key findings

No industry is immune to the changes brought about by digitization, although some are yielding to the pressure more quickly than others. On the face of it, travel and logistics exemplify the extremes. There is hardly a consumer in Europe who does not take to the Internet when thinking about booking accommodation or flights or looking at train timetables for an upcoming trip. Yet few businesses search online for information about air cargo. The balance of industry-related searches brings home the point: in 2017, for every 80 travel-related queries there was one logistics-related query, according to our research.

However, that same research – undertaken by McKinsey in collaboration with Google and the Kühne Logistics University in Germany, based on data from 15 key European countries and extensive interviews with experts on technology, travel, and logistics[1] – reveals significant variations in customers' online behavior and companies' response within the sub-sectors of the two industries. It also points to important trends that indicate how companies in both industries should be preparing for a digital future. For example:

- **Where business-to-consumer (B2C) sectors have led, business-to-business (B2B) sectors are being forced to follow.** In the logistics industry, ocean carriers and freight forwarders are among the sub-sectors feeling pressure from customers to move online. The number of Google searches for terms related to them grew on average by 8 and 14 percent a year respectively between 2014 and 2017, outstripping growth in accommodation, which, across the two industries, is the sub-sector with the highest search volumes.

- **The power of mobile is rising.** While online searches in travel and logistics are increasing, so too is the proportion of those searches conducted on a smartphone. In 2017, they accounted for around 43 percent of all travel-related requests and 23 percent of logistics-related searches. Tablets and desktops combined shared the remainder. The trend suggests the importance of adopting a "mobile first" mindset, prioritizing quick and easy mobile interactions. Yet rare is the company – even in the most digitally mature B2C sectors – whose mobile channels outperform the desktop.

- **Most logistics companies provide limited online services.** Only 6 percent of the largest ocean carriers and freight forwarders have end-to-end online booking capabilities. Some 38 percent of the former and 5 percent of the latter do not even offer online quotes, while most of those that do merely log an online request for a quote, which has to be followed up by e-mail or a phone call, often a day or more later. By contrast, several attackers offer a full suite of online services.

- **In travel, there are as many as 100 prebooking online touchpoints.** No wonder it is so hard to win customers' attention. When researching travel online, the average customer shifts more than 50 times across channels, desktops, tablets, and mobile devices, chalking up roughly 100 prebooking touchpoints.[2] That adds up to way too many chances of losing potential customers if different information is given in different channels, customers are forced to re-enter the same data time and again, and the sales agent has no record of the information given online. In addition, the majority of touchpoints are not "owned" by the travel company. Our research showed airlines owned fewer than 20 percent of all preflight digital touchpoints. That means companies have to be smart in knowing which of the

1 See methodology.

2 Google/Ipsos Connect, April 2016.

various search engines, review sites, blogs, and so on are relevant to their potential customers to focus advertising budgets effectively.

- **Slow page loads are a sure way to lose customers.** Analysis of the websites of 33 large ocean carriers showed that more than half took 13 seconds or more to load on a typical mobile device, while 20 percent took more than 20 seconds. In comparison, the front pages of leading e-commerce companies typically load in significantly less than 10 seconds on a 3G network. Bounce rates – the share of users who do not explore a website beyond the first page – are strongly related to load times. On average, page load times are 50 percent slower for users that "bounce" than for those who continue to engage with a website.[3] This is an unnecessary loss of potential business considering the ease with which load times can be improved.

All this matters because of the potential threat digitization poses to incumbents unless they take steps to harness its potential fully. The transparency the Internet brings puts downward pressure on margins at the same time as attackers – often new, technology-savvy companies that adapt innovations with speed – are raising the bar on what consumers expect, while reducing the cost to serve those customers and accelerating the pace of digitization.

A benchmark and a guide to where future value lies for customers

Against this backdrop, the research and analysis set out in this paper does two things.

First, for all companies in the travel and logistics industries, it provides a benchmark of the digital maturity of the sub-sector in which they operate. It does so by looking at six measures. Three gauge customers' demand for online interactions and services: the number of searches made through Google's search engine, the share of those searches made on smartphones, and online bookings. Another three gauge companies' online marketing response to customer behavior, judged by the intensity of their online advertising. These are advertisement coverage (how often a search is accompanied by an advertisement), advertisement depth, and "cost per click."[4] The last two are measures of the level of competition for online advertising "real estate."[5]

Second, we consider the specific actions that companies can take both in the short and medium term to ward off competition and create value from digitization. We do this by examining passenger air travel as an example of a B2C business, and ocean cargo and freight forwarding as examples of B2B businesses. Of course, the structure and competitive dynamics of each sub-sector differ. Nevertheless, the two-part approach we outline here is applicable to all companies, be they B2C or B2B.

To begin with, companies need to act quickly to improve customers' online experience. For air travel companies, ocean carriers, and freight forwarders alike, that might mean cutting the time it takes for a webite to load on to a mobile device, becoming more savvy about how to attract customers to their sites, or learning where they might lose customers on their online journeys and fixing the problem. Relevant information, such as the pitch of an airline seat,

3 Google, July 2016.

4 All six measures are based on data from Google's search engine.

5 Analysis of how a company's digital maturity can be measured in terms of its strategy, organization, culture, and capabilities can be found at https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/raising-your-digital-quotient

might be lacking, or there might be too many clicks required (some 30 percent of smartphone users will switch to another app if it fails to meet their needs immediately).[6] For ocean carriers and freight forwarders, upgrading websites to enable customers to book directly online or improving self-service offers could be in order.

At the same time, companies need to look further ahead, and understand and embrace the key technology-driven trends that will transform customers' experience.[7] We take a close look at 11 emerging technologies, and suggest areas where they will have the most impact.

In air travel, for example, products will become more personalized and offers increasingly transparent. Among others, virtual reality (VR) and augmented reality (AR) will drive this change. There will be greater use of digital "travel assistants," capable of making and personalizing suggestions by applying machine-learning technologies. And air travel companies will be able (and expected) to engage continuously with customers.

In ocean cargo and freight forwarding, technology will usher in smarter pricing and more tailored solutions, more collaboration along the value chain, and more data-driven products and services. For example, advanced analytics and the Internet of Things (IoT) could deliver end-to-end shipment visibility – perhaps to pharmaceutical companies whose temperature-sensitive products need constant monitoring – if containers, systems, and fleets were modified. And with better links to terminals and truckers, ocean carriers could, for a price, prioritize the loading and unloading of customers' containers.

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A successful strategy will depend upon understanding emerging technologies, the ways they could transform customer interactions, the pace at which they might be adopted, and how these factors might change industry structures and cause shifts in revenues and profit pools. The content of this report will help all manner of companies, whether they serve business customers in logistics or consumers in travel, to craft such strategies.

6 Consumer in the Micro-Moment, Wave 3, Google/Ipsos, 2015.

7 The same technologies that present companies with the opportunity to serve their customers better also present them with opportunities to optimize their operations and lower costs. This topic is not covered in this report.

The digital state of play

Technology is transforming the way companies and customers interact.

Travel and logistics are big business, accounting for 10 and 5 percent respectively of world-wide GDP.[8] In 2016, revenue in the European travel and logistics industries amounted to EUR 330 billion and EUR 410 billion respectively. Exhibit 1 shows the breakdown by industry sub-sector, with air travel and trucking being the clear leaders.

Exhibit 1

Travel and logistics sub-sectors by revenue – air travel and trucking are clear leaders

European[1] revenues, 2016

Industry	Sub-sector	**Revenue** EUR billions	**CAGR** (since 2014) Percent
Travel	Air travel	116	↑ 4.3
	Accommodation	95	↑ 3.8
	Holiday package	55	↑ 3.3
	Passenger rail	33	↑ 3.3
	Cruises	19	↓ 2.8
	Car rental	12	↑ 5.8
Logistics	Trucking	320	↑ 2.0
	Freight forwarding	42	↓ 3.0
	Ocean cargo	22	↓ 3.0
	Rail cargo	20	↑ 1.0
	Air cargo	3	↓ 3.0

1 For logistics: spend originating from European shippers

SOURCE: Transport Intelligence, McKinsey

Each industry, however, is in the midst of rapid change as new technologies transform the way customers and companies interact (see sidebar "Technologies shaping the travel and logistics industries"). Already, some 50 percent of revenues from passenger air travel in Europe derive from online bookings, often exerting pressure on incumbents' margins. By 2017, revenue per available seat kilometer among a sample of ten European airlines had dropped to 4.1 cents from 8.2 cents in 2007. And while the logistics industry has been slower to feel the effects given its B2B focus, it is far from immune. The number of Google searches for terms relevant to ocean cargo and freight forwarding in the 15 European markets included in our research grew by an average of 8 and 14 percent a year respectively between 2014 and 2017.[9] Yet search terms directly associated with ocean cargo are about 50 percent more common than terms related to freight forwarding (whether air or ocean).

8 World Travel & Tourism Council and the World Bank Group. Including indirect and induced effects.

9 Germany, the United Kingdom, France, Italy, Spain, Austria, Switzerland, Belgium, the Netherlands, Poland, Norway, Finland, Sweden, Denmark, and Luxembourg.

New, digital players are often those upsetting the status quo. Not only do they attack incumbents' sources of profit, but they also speed up the disruption of an industry by shaping customers' experience and expectations and continually lowering the cost to serve. Having focused at first on the travel industry, they have since turned firmly to the logistics industry. Venture capital investments in logistics companies worldwide reached USD 4 billion in 2017, almost 25 times higher than in 2012,[10] accelerating the pace of digitization. In ocean freight shipping, for example, emerging e-forwarders now offer self-service options such as instant quotes and bookings, along with digital invoicing and end-to-end visibility ("track and trace") of shipments.

Incumbents can sometimes struggle to keep pace, not least because customer journeys are so complex: the average customer researching travel online jumps more than 50 times between desktop, tablet, and smartphone, and between channels, encountering as many as 100 prebooking touchpoints.[11] Many travel companies still fail to provide a seamless experience for their customers, with different information given in different channels, details lost, and customers forced to re-enter the same data time and again. No wonder potential customers are lost along the way.

To compete against this backdrop, it is important for companies to understand the level of digital maturity so far achieved in their industries. To assess this, we gauged customers' online behavior by examining Google search engine data in 15 European countries that represent more than 85 percent of Europe's population and GDP. In addition, we analyzed companies' response in terms of their digital marketing, again using Google data. The results help make clear where efforts should be focused, both to keep pace with customer expectations and ward off attackers, and potentially to exceed those expectations and gain a competitive lead. There are clear differences in the industry structures of the travel and logistics industries as well as between sub-sectors within those industries. Nevertheless, all companies can learn from what the most digitally mature have achieved, whether or not they are in the same sub-sector or even the same industry.

Technologies shaping the travel and logistics industries

Technology has been the key driver of recent changes in the travel and logistics industries and will be so in the future, although today's pace of technological development and adoption can make that future hard to predict. Consider this: it takes 23 minutes on a 3G network to download 1.25 GB. With 5G, it will take just one second. What new and as yet unimagined business models will that unleash?

The pace of adoption can be scary too. The likes of Twitter and Facebook built a 50-million-strong social media audience in less than one year. Moreover, digital technology makes it hard to see from where new competition will emerge. Many of those bent on industry disruption will not be insiders, as digital technology is blurring the lines between industries and forging new, cross-industry partnerships.

10 PitchBook, 2017.

11 Google/Ipsos Connect, April 2016.

Despite all this, to devise successful strategies, companies will need to understand the new technologies emerging, the pace at which they might be adopted, and how these developments might change their industry structure and shift revenues and profit pools. Our research suggests there are currently 11 technologies that have the potential to reshape the travel and logistics sectors at unprecedented speed and scale. They can be grouped into five clusters in terms of what they facilitate.

For example, the IoT and distributed and nondistributed ledgers facilitate the seamless collaboration of devices and organizations, while advanced analytics and machine learning enable automated decision making. The five clusters are explained in Exhibit 2.

Exhibit 2

Technology cluster	Selected technologies	Explanation
Industry shaping		
Seamless collaboration of devices and organizations	Internet of Things	Sensors and actuators embedded in physical objects that are linked through wired and wireless networks. These networks churn out huge volumes of data for analysis
	Distributed ledger	Blockchain and other, non-blockchain-distributed data structures, enabling the efficient, secure exchange of data
Smart automated and semi-automated decision making	Advanced analytics	The combination and interpretation of huge data sets to create complex models and systems that can be used for demand forecasting or predictive maintenance, for example
	Machine learning	The application of deep learning algorithms based on artificial neural or Bayesian networks to improve data-driven decisions constantly and automatically
Smooth, contextual human-machine communication	Human-machine interaction	The application of natural language processing, gesture and facial recognition, and sentiment analysis algorithms to enable greater interaction between humans and machines
	VR/AR	Immersive technologies that can alter the way we interact with content
Changes in physical production processes	Advanced robotics	Advanced, automated hardware that replaces or supplements human labor. Autonomous cars and ships, drones, and humanoid robots are examples
	3D printing	3D printing of diverse materials based on polymerization (for example, stereolithography), bonding agent, and melting technologies
Hygiene		
Fast, secure, on-demand data access (digital hygiene)	5G (mobile Internet)	Superfast mobile Internet connectivity
	Cybersecurity	The application of encryption algorithms and stress tests to prevent computer systems from being hacked
	Cloud computing	The application of cloud solutions (for example, public/private/hybrid cloud) for flexible, on-demand data access

SOURCE: McKinsey

Measures of maturity

What customers want online and what they get differs greatly by industry sub-sector.

To gauge customer behavior we looked at three indicators of digital maturity: search volumes – that is the number of searches made through search engines, be it to look up rates and schedules or to track deliveries; the share of those searches accounted for by smartphones; and online bookings. To gauge companies' response to customer behavior, we also assessed advertisement coverage, advertisement depth, and the "cost per click" – all measures of the intensity of online advertising. We did this in 15 European countries.

Exhibit 3 shows the results, with each sub-sector ranked between one and six on each measure for the travel industry, and between one and five for the logistics industry, where one indicates the highest level of digital maturity. (For comparison, it also shows each industry's digital quotient – a measure of a company's digital maturity in terms of its strategy, organization, culture, and capabilities, rather than customers' online behavior and companies' response.[12] As might be expected, overall, the more consumer-focused travel industry is further advanced digitally than the B2B logistics industry. Yet deeper analysis reveals new insights.

Exhibit 3

Key performance indicators show varying levels of digital maturity across sub-sectors

Ranked on a scale of 1 to 6 for travel and 1 to 5 for logistics, where 1 is high

		Travel						Logistics				
Dimension	**KPI[1]**	Air travel	Accommo-dation	Holiday package	Passenger rail	Cruises	Car rental	Trucking	Freight forwarding	Ocean cargo	Rail cargo	Air cargo
Customer behavior	Search volume	2	1	4	3	6	5	3	2	1	4	4
	Share of mobile searches	4	2	5	1	5	3	2	3	5	1	4
	Online bookings	1	3	5	4	n/a	2	5	1	3	4	2
Company response – digital marketing	Coverage	4	1	3	5	2	1	1	5	4	3	2
	Ad depth[2]	4	2	3	5	2	1	2	3	5	4	1
	Cost per click[3]	5	2	4	6	3	1	3	2	4	5	1
	Average	3.3	1.8	4.0	4.0	3.6	2.2	2.7	2.7	3.7	3.5	2.3
McKinsey Digital Quotient[4]		41						32				

1 If 2 sub-sectors show the same value for a KPI, the same rank is given to both
2 Number of advertisements shown for a relevant search query
3 Highest EUR value ranked as 1
4 The McKinsey Digital Quotient (DQ) measures the digital maturity of corporations in terms of strategy, organization, culture, and capabilities on a scale of 0 to 100. Digital leaders score 62 on average

SOURCE: Google; McKinsey

12 For further explanation, see https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/raising-your-digital-quotient

Customer behavior

The extent to which customers are comfortable using online channels in their interactions with travel companies, or indeed expect to be able to use these channels, is reflected in three measures.

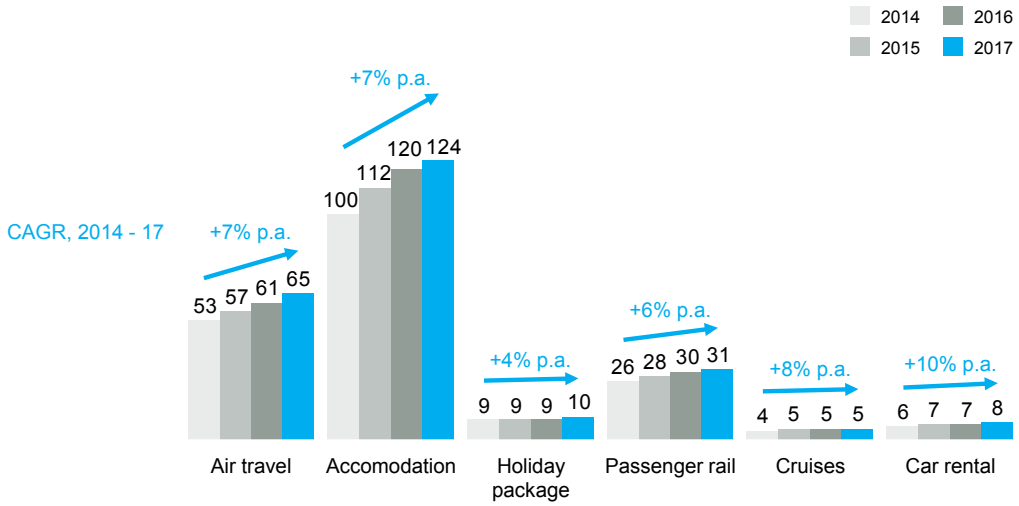
Search volumes

Search volumes are a leading indicator of online bookings, as observed in other industries such as retail. In travel, search volumes have expanded in almost all sub-sectors in the past three years, with cruises and car rentals the fastest growing. The number of search queries is largest by far for accommodation, possibly because it is fragmented, with hundreds of hotels and self-catering options to choose from (Exhibit 4).

Exhibit 4

The volume of online searches is growing in every sub-sector of the travel industry

Indexed to highest level across all sub-sectors in 2014[1]



	Air travel	Accomodation	Holiday package	Passenger rail	Cruises	Car rental
Revenues Europe, 2016 EUR billions	116	95	55	33	19	12

1 Search volume on Google's platform in 15 European countries. A collection of key words was used to categorize searches by industry

SOURCE: Google; McKinsey

Growth in search volumes in the logistics industry is even stronger, albeit from a lower base (Exhibit 5). Interestingly, trucking cargo records only half the number of search queries that ocean cargo does even though the sub-sector is ten times larger in terms of revenues. The strong rise in ocean cargo searches reflects a trend among smaller companies to use search engines to get a clear idea of prices and book directly with carriers, rather than rely entirely on freight forwarders to arrange end-to-end deliveries. The trend might premise pricing pressure on freight forwarders.

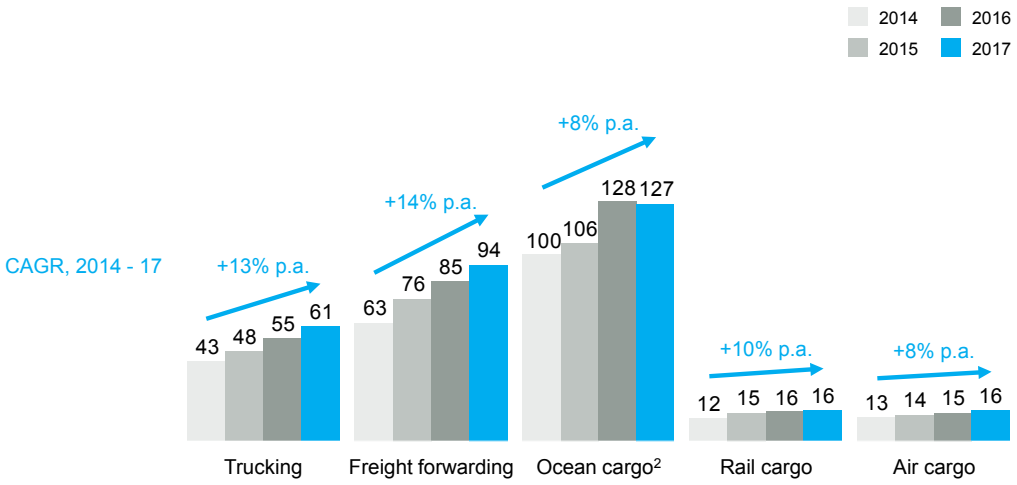
Mobile share

Whether in travel or logistics, the proportion of searches conducted on a smartphone has soared, rising between 27 and 56 percent a year between 2014 and 2017 depending on the sub-sector (Exhibit 6). Smartphones, as opposed to desktops and tablets, now account for around 42 percent of all travel-related requests and 23 percent of logistics-related searches, highlighting the importance of companies strengthening their marketing capabilities for smartphones.

Exhibit 5

The volume of online searches is growing in every sub-sector of the logistics industry

Indexed to highest level across all sub-sectors in 2014[1]



Revenues Europe, 2016 EUR billions	Trucking	Freight forwarding	Ocean cargo[2]	Rail cargo	Air cargo
	320	42	22	20	3

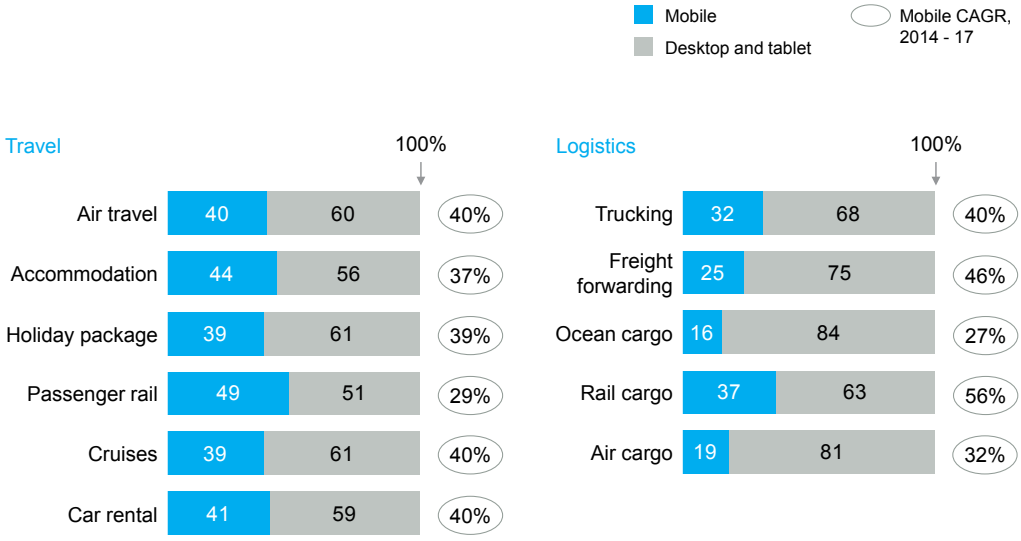
1 Search volume on Google's platform in 15 European countries. A collection of key words was used to categorize searches by industry
2 Search volume in 2017 influenced by industry consolidation

SOURCE: Google; McKinsey

Exhibit 6

Mobile's share of search volume is rising fast

Share of searches, percent[1]



1 Search volume on Google's platform in 15 countries. A collection of key words was used to categorize searches by industry

SOURCE: Google; McKinsey

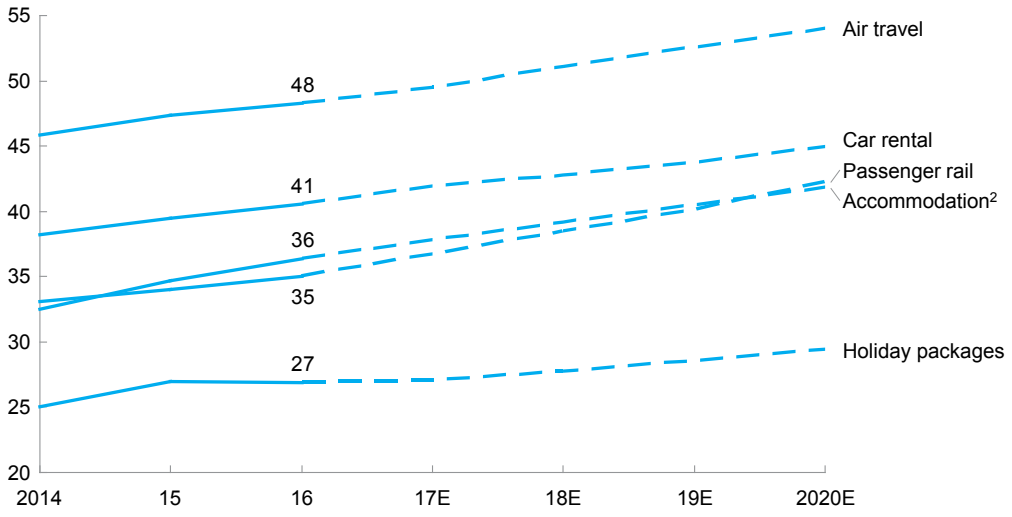
Online booking

As noted, almost half of the bookings in the air travel industry in terms of revenue are made online[13] – a trend that may well be replicated in other sub-sectors in the travel industry. The only travel sub-sector where we do not envisage continued strong growth in online bookings is package holidays. Because of the complexity of some of these products, many customers continue to consult agents (Exhibit 7).

Exhibit 7

Online booking revenues in the travel industry – air travel leads the pack

Online transaction share per sub-sector,[1] 2014 - 20, percent



1 Corporate agents excluded due to lack of transparency. Directly booked corporate travel included. Data for cruise lines not available
2 Hotel bookings only

SOURCE: Phocuswright; Euromonitor; McKinsey

Nonetheless, offline still matters – for the time being at least. We found that across the European travel industry, 87 percent of all bookings involved online research, but 42 percent of these were ultimately carried out offline. Exhibit 8 shows the different ways in which customers combine online and offline activity in different sub-sectors. So-called "research online, purchase offline" (ROPO) behavior is highest for package holidays, while flights are predominantly researched and bought online. Note though that the share of ROPO customers has fallen in every sub-sector; more and more customers are happy to stay online.

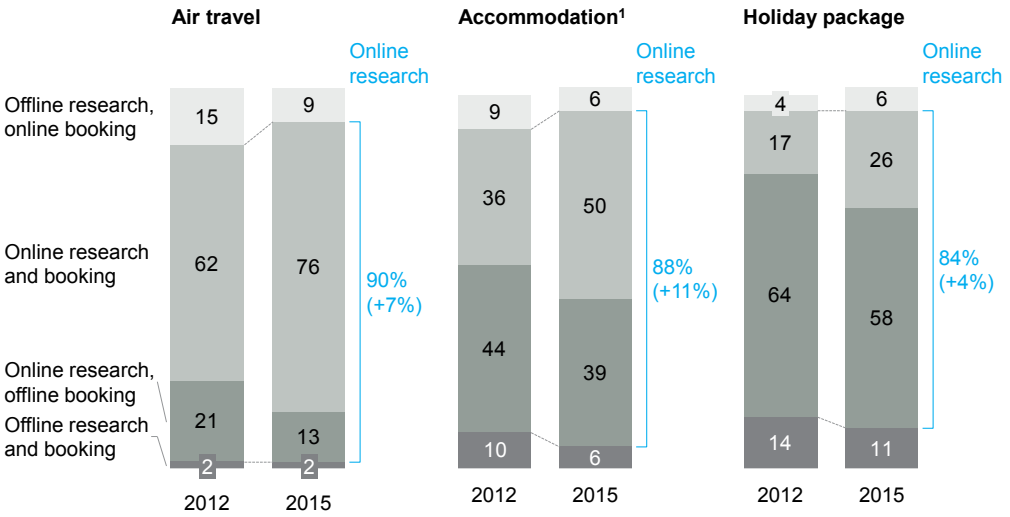
The picture is different in the logistics industry, where only a tiny percentage of companies so far offer online booking facilities. As Exhibit 9 shows, most large companies give online quotes, but these are often supported by largely manual back-end processes. The exception is trucking, where seven of the ten large companies in our analysis still rely on offline quotations and booking requests.

13 This is the combined share for low-cost and full-cost carriers. Online booking is part of low-cost airlines' business model. Hence, some 88 percent of their bookings are made online. The share for full-service carriers is 30 percent.

Exhibit 8

Online research and booking in the travel industry are growing, but offline still matters

Share of bookings 2012 and 2015, percent



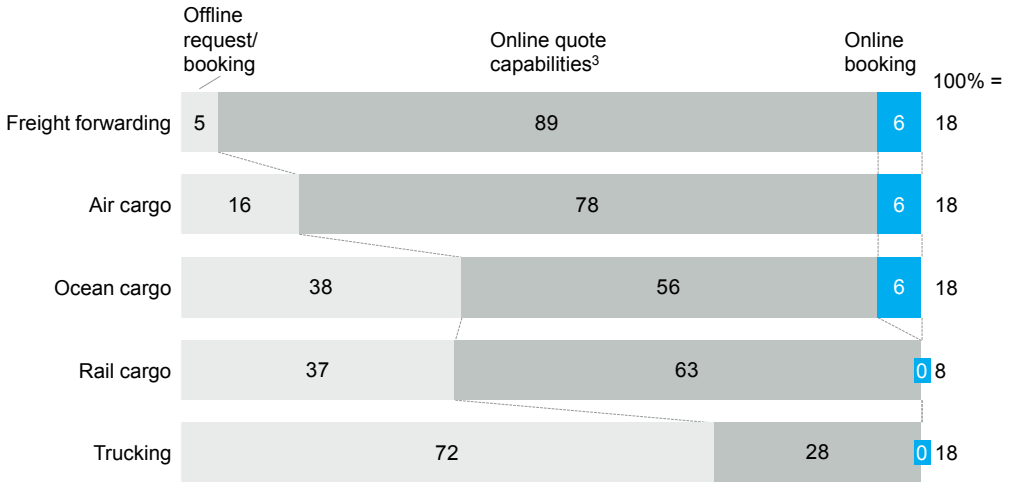
1 Only includes hotels

SOURCE: GfK Crossmedia Link, 2015; Google

Exhibit 9

Few logistics companies offer a complete online booking service

Percent of biggest 18 companies per sub-sector by revenues[1] offering these services[2]



1 There are only 8 relevant rail cargo companies
2 As of Q3 2017
3 Whereby a quote can be requested online, but the final rate and booking option are provided offline

SOURCE: Press and online research; McKinsey

Companies' response

The extent to which companies are responding to customers' online behavior is reflected by the three measures of digital marketing.

Advertisement coverage

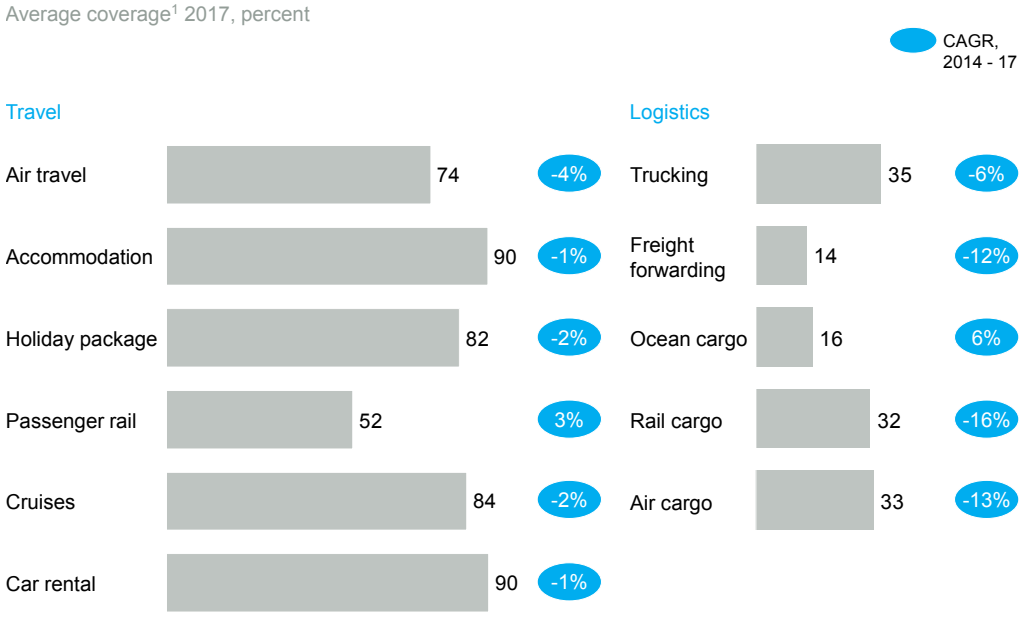
Coverage is the share of online searches that are accompanied by a relevant online advert, and so reflects the degree to which companies feel they have to compete for customers online. The difference in digital maturity between the travel industry and the logistics industry in this respect is stark (Exhibit 10). In the car rental, accommodation, and cruise sub-sectors, almost nine out of ten online search requests prompt an advert. In logistics, it is between one and three out of ten. Of course, blanket coverage is not necessarily the goal. The average customer lifetime value, customer retention rates, gross margins, and average revenue per user will vary by sub-sector, influencing whether online marketing makes commercial sense.

In fact, as Exhibit 10 shows, coverage has been dropping across many sub-sectors due to companies shifting their attention to more relevant and targeted keywords.

Exhibit 10

Advertisement coverage for search requests reveals gulf between industries

Average coverage[1] 2017, percent



1 Advertisements relating to searches on Google's platform in 15 European countries. A collection of key words was used to categorize searches by industry

SOURCE: Google; McKinsey

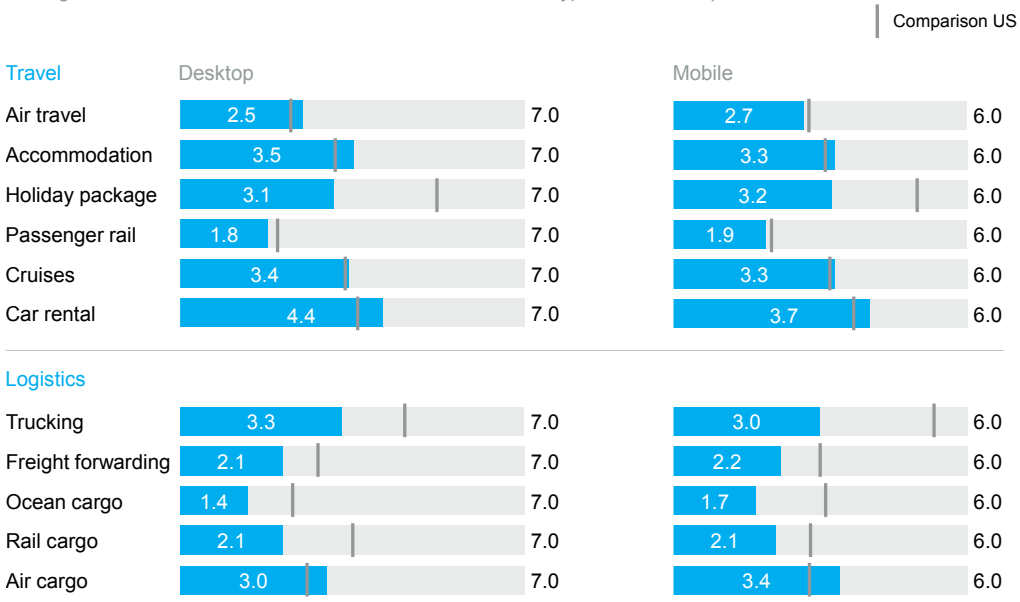
Advertisement depth

While coverage measures whether searches are matched with an advert, advertisement depth gauges the level of competition for advertising slots, of which there are usually six or seven per webite. In both travel and logistics, on average about half of the available slots are filled. In travel, this is comparable with the United States, with the exception of the package holiday sub-sector, which appears to be much more competitive in the US market. All logistics sub-sectors except for air cargo fall behind on advertisement depth in comparison to the United States, however (Exhibit 11).

Exhibit 11

Advertisement depth – Europe lags the US in logistics

Average number of available advertisement slots taken for a typical search request,[1] 2017



1 Advertisements for search requests on Google's platform in 15 European countries. A collection of key words was used to categorize searches by industry

SOURCE: Google; McKinsey

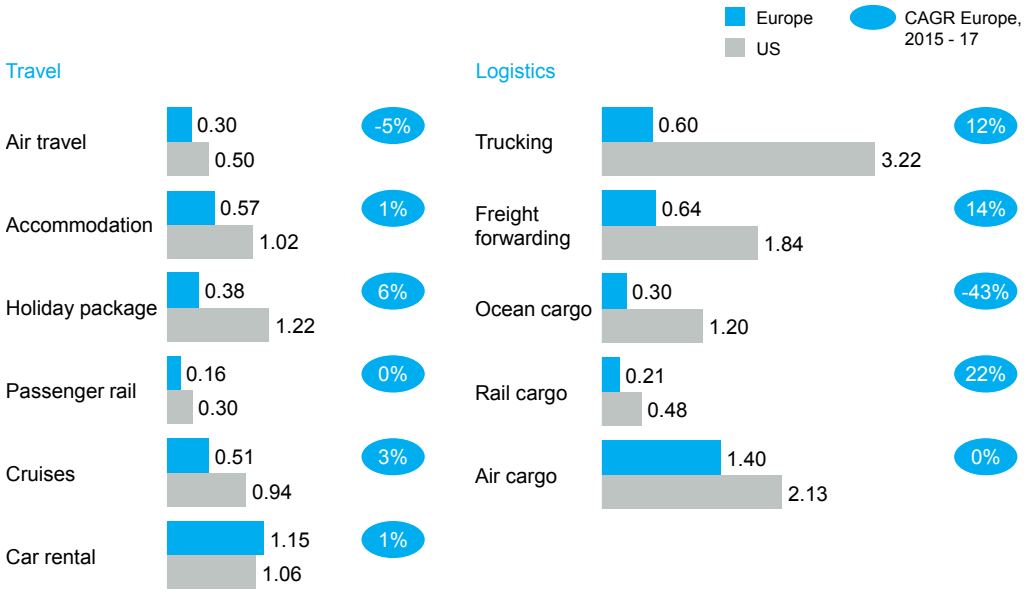
Cost per click

With one exception, the cost per click – that is, the fee an advertiser is charged when an individual clicks on an online advert – is lower on Google's platform in Europe than it is in the United States in every sub-sector in both industries (Exhibit 12). The biggest gap occurs in trucking, where the average cost per click in 2017 was EUR 0.60 in Europe versus EUR 3.22 in the United States, where the sector is more consolidated and profitable. This is significant because if the more advanced US market is an indicator of things to come, companies in Europe, and particularly in logistics, will likely see more competition for online advertisement slots.

Exhibit 12

Cost per click for online ads indicates greater competition for slots in the US

Average 2017, EUR[1]



1 Cost per click on Google's platform in 15 European countries. A collection of key words was used to categorize searches by industry

SOURCE: Google; McKinsey

Flying high

How air travel companies should rethink the customer journey to meet soaring expectations.

The travel industry has proved an ideal target for digital attackers, with online travel agencies and metasearch engines such as Kayak and Expedia enjoying multi-billion-dollar valuations. Air travel has been particularly fertile territory. Online bookings as a percentage of revenue are highest in this sub-sector than in any other in the travel industry. And although the Internet presents companies with the potential to resist commoditization by providing customers with richer information, so far it has only engendered it. Some 56 percent of customers base their flight booking decisions primarily on price, but those booking online are even more price sensitive.[14] Perhaps not surprisingly therefore, transparency has helped reduce the spread of revenue per available seat kilometer among airlines.

This is just the start. More far-reaching disruption lies ahead as technologies mature and customer expectations continue to rise. No part of the customer journey will be immune from digital's influence. So how should air travel companies respond?

Although air travel customers are among the most digitally mature among consumers in the travel industry, airlines have not always kept pace with them in terms of their marketing. And most carriers are still struggling to provide fully-fledged, easy-to-use digital services. This has to improve if they are not only to withstand downward pressure on prices, but also start creating value from the opportunities afforded by digitization. Here, based on our research, we describe two essential operational measures that can improve customers' online experience and boost returns on investment in the short term. We also describe three technology-driven trends that will ultimately transform airlines' offers to customers and the customer experience, and which airlines should embrace if they are to prosper in the longer term.[15]

Operational actions

Two broad measures will help air travel companies meet rising customer expectations and competitive pressures.

Make the most of your online "real estate"

The typical online customer journey for booking air travel is drawn-out and complicated. Exhibit 13 shows that a typical airline consumer will alight on 34 touchpoints before deciding which ticket to buy.

Importantly, carriers currently "own" relatively few of these prebooking touchpoints. Analysis of German customers' online behavior prior to booking showed carriers owned fewer than 20 percent of them. More than 50 percent belonged to online search engines and other travel sites such as travel blogs, review portals, or specialists such as Seatguru. As a result, full-service carriers receive only about 60 percent of online traffic to their sites from either an organic or direct search, relying heavily on paid referrals and search advertisements to drive traffic their way. Low-cost carriers fare better. Some 72 percent of traffic on their websites originates from direct requests from users or from organic searches (Exhibit 14).

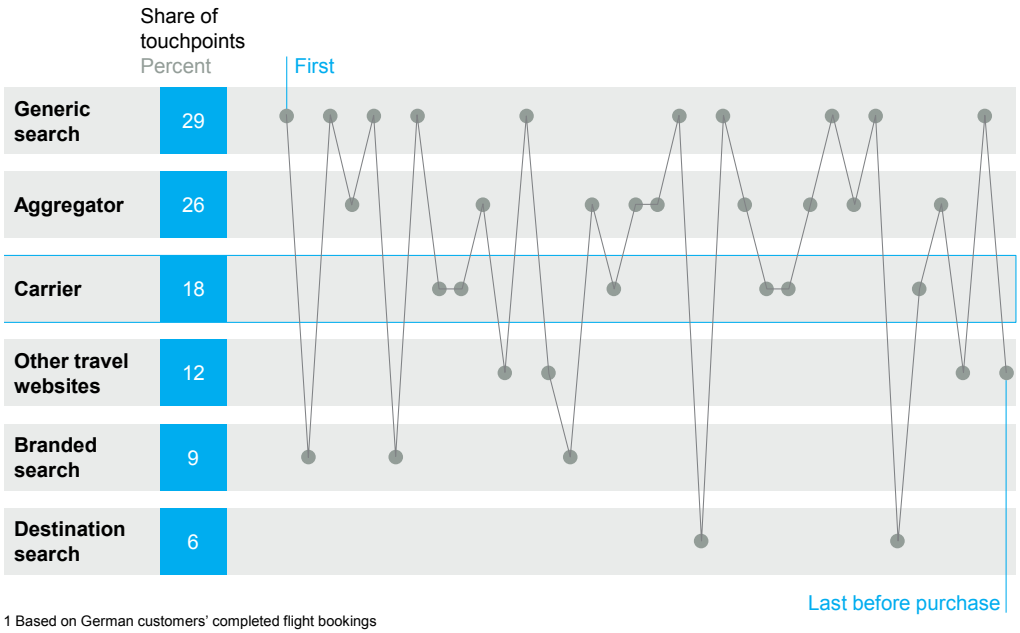
14 Granados et al: "Online and Offline Demand and Price Elasticities: Evidence from the Air Travel Industry," 2012.

15 The same technologies that present companies with the opportunity to serve their customers better, also present them with opportunities to optimize their operations and lower costs.

Exhibit 13

Desktop flight research – carriers own a minor share of touchpoints

Average number of touchpoints = 34[1]



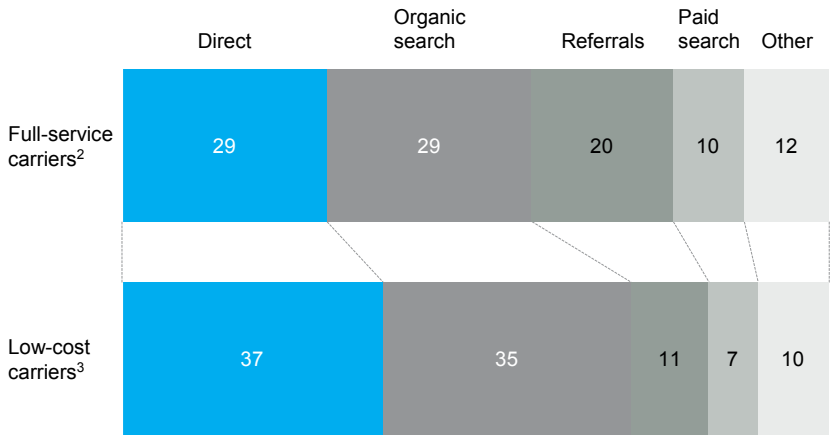
1 Based on German customers' completed flight bookings

SOURCE: GfK Crossmedia Link, 2015; Google

Exhibit 14

Low-cost carriers win a larger share of direct search traffic than full-service carriers

Percent[1]



1 As of May 2017
2 5 leading carriers
3 5 leading carriers

SOURCE: SimilarWeb

To drive more traffic their way, and do so cost efficiently, airlines should first make sure their marketing content is relevant. For instance, if a customer has already booked a flight, targeting that person with more adverts for the same flight is a waste of money. The focus should be instead on relaying trip-relevant information and approaches that might generate more business, including upgrades, car rental, accommodation, and insurance.

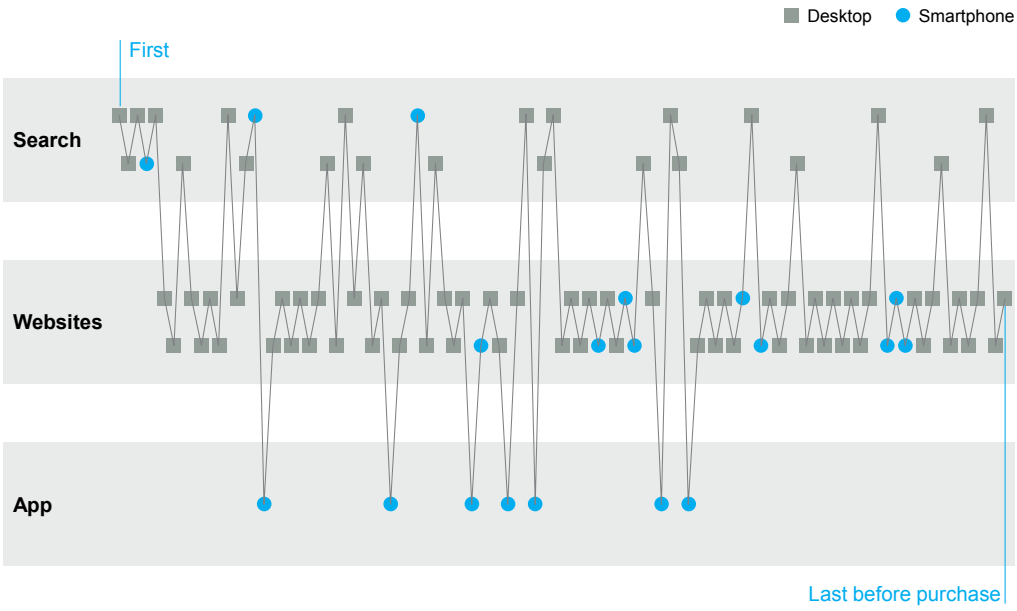
They also need to figure out which channels are relevant. Programmatic advertising – that is, advertising automatically generated by user data and algorithms in the relevant online space – can be one way forward. Data on current load factors, the profitability of certain routes, and contextual information on potential customers can all be used to target advertising, although returns on investment on such campaigns still need to be carefully monitored.

Reduce breakpoints

We have discussed how companies have to make the most of their online real estate by making sure advertising takes into account the customer's online journey. They also need to work to avoid losing a potential customer on that journey, considering not only the different sites they visit, but also the different devices they use. Exhibit 15 shows that a customer booking an entire trip – including flights, car rental, and accommodation – could alight on as many as 100 touchpoints, often using a smartphone for part of the research.

Exhibit 15

Researching and booking a trip online involves an average of 100 touchpoints[1]



1 Average based on German customers' completed purchases for an entire trip, including one or more flights, hotel stays, and car rentals

SOURCE: GfK Crossmedia Link, 2015; Google

It is crucial that companies do not lose a customer at any of the potential "breakpoints" under their control, that is, their own touchpoints. We examined the touchpoints on the customer online journeys of 25 major airlines, and found that most still struggle to provide customers with complete, easy-to-use digital services (Exhibit 16). Air travel companies therefore need to consider where they are most likely to lose a customer, and decide a cost-effective way of

preventing this from happening. Common reasons for a user not making a purchase or looking to competitors include the failure to receive relevant information (such as the pitch of an airline seat), an interface not designed for a mobile device, or that too much effort is required. One way to reduce breakpoints is to prepopulate search fields or payment data based on information received from other channels.

Exhibit 16

Assessment of touchpoint quality for airlines – no company excels

Sample of 25 major airlines[1]

1 Data on 25 major airlines from McKinsey's airline digital diagnostics database (AD3), October 2017
2 Average quality of customer touchpoints predeparture, during airport connections, and in-flight

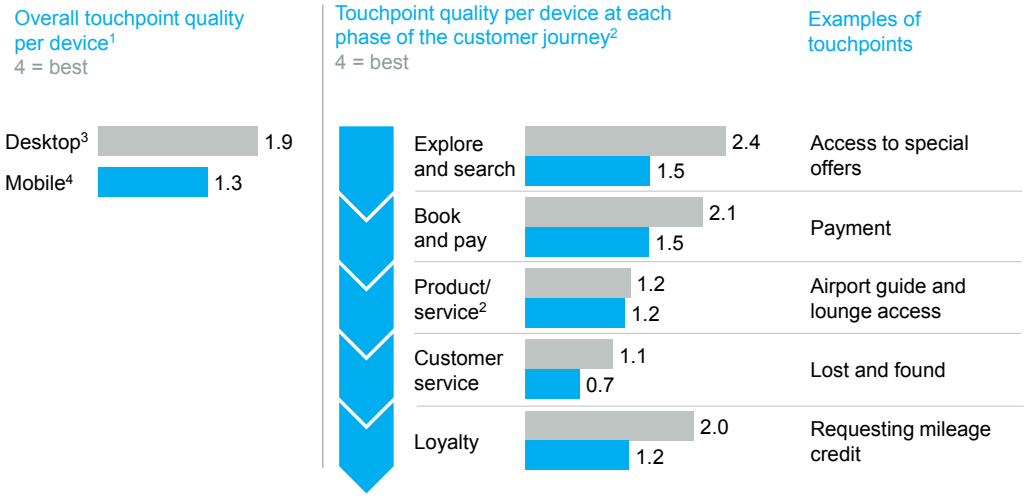
SOURCE: Company websites; McKinsey

Particular attention needs to be paid to customer interactions on mobile devices, given how central they have become to consumers' online behavior. Smartphones already account for some 40 percent of all air-travel-related searches. Yet some 30 percent of smartphone users will switch immediately to another app or site if it fails to satisfy their needs.[16] Airlines therefore need to embrace a "mobile first" mindset, prioritizing quick and easy mobile interactions. We measured the quality of the user experience at different stages of the customer journey on smartphones and desktops and found that, despite the advantages of mobile applications for airlines, such as knowing the user's precise location, there was not a single stage of the customer journey at which, on average, the mobile channels of airlines outperformed desktop channels (Exhibit 17). In many cases, desktop versions are simply ported to mobile without factoring in customers' different requirements and the device's specific constraints, such as limited space. Sometimes, functionalities such as the redemption of frequent flyer miles are simply removed from the mobile version of the website, rather than restructuring it.

16 Consumer in the Micro-Moment, Wave 3, Google/Ipsos, 2015.

Exhibit 17

Airline customers' mobile experience lags behind their desktop experience



1 Touchpoints assessed on data on 25 major airlines from McKinsey's airline digital diagnostics database (AD3), October 2017
2 Average quality of customer touchpoints predeparture, during airport connections, and in-flight
3 Includes tablets
4 Mobile app

SOURCE: Google; McKinsey

To prevent breakpoints, the focus should be on improving page-load times. Potential customers quickly get impatient: 53 percent of mobile site visitors abandon a page that takes longer than three seconds to load.[17] Today, website load times differ enormously among carriers (Exhibit 18). Methods of cutting the load time include reducing the file size of shown content, prioritizing above-the-fold content, and distributing content geographically. Progressively switching on (noncritical) features such as animations can also transform the mobile experience, depending on a browser's capabilities and a user's connection.

Three transformative technology-driven trends

The sidebar, "Technologies shaping the travel and logistics industries," describes changes afoot due to 11 emerging technologies. For example, advanced robotics and 3D printing are changing production processes, and advanced analytics and machine learning are facilitating automated decision making.

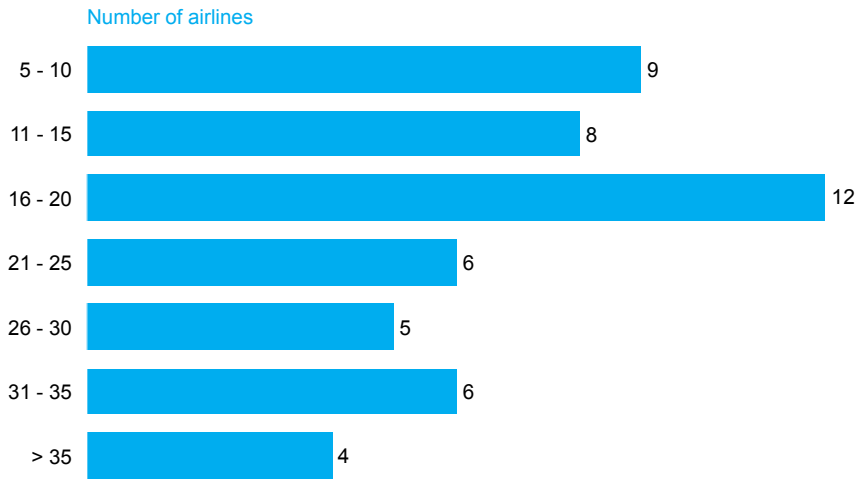
To understand in greater depth what these new technologies will mean for air travel incumbents, we interviewed technology and industry experts from airlines, academia, Google, and McKinsey, asking them to consider how the technologies would transform offers to customers and the customer experience. The results are shown in Exhibit 19. Advanced analytics and machine learning will enable detailed flight comparisons and searches, along with more personalized recommendations, for example. And new sales potential will arise from VR, AR, and the IoT.

17 Google-internal data.

Exhibit 18

The focus should be on improving website load times

Seconds to load[1]



1 Average website loading time for 50 global airlines, using a simulated, disruption-free 3G connection on a mobile phone, October 2017. Results can vary according to circumstances at time of testing

SOURCE: Webpagetest.org

From the interviews, three clear technology-driven trends emerge. Products will deliver virtual experiences and become increasingly transparent and personalized. There will be greater use of digital travel assistants to personalize products. And airlines will be able (and expected) to engage continuously with customers. These are delineated as sections A, B, and C respectively on Exhibit 19.

We asked representatives of 50 airlines[18] to tell us which of these trends would be most important to the industry. They ranked them in the order below.

1. Virtual experiences, product transparency, and personalization

Airline representatives believe that virtual experiences, personalized products, and product transparency are the technology-driven developments that will most transform the customer experience. We identified some of the ways these developments will be felt in the prebooking process.

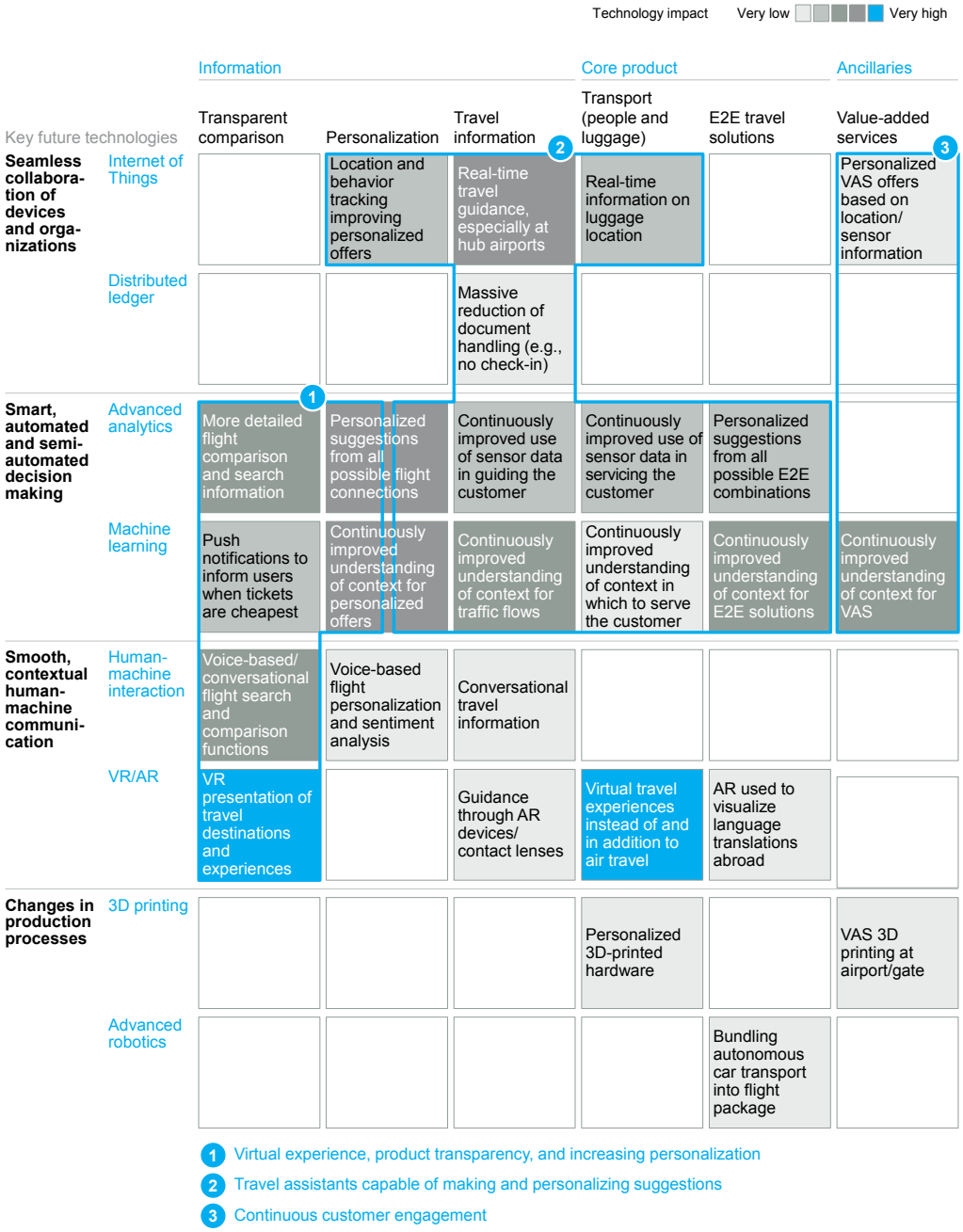
AR and VR will change the customer experience when exploring travel destinations or enquiring about product features, such as the privacy afforded in a business class seat. Consumers are already embracing the new technology: AR/VR iOS app downloads increased six-fold from 2015 to 2016,[19] and some airlines are catching on. Virgin America uses Google StreetView to let customers preview its mood-lit cabins, for example.

18 Interviews were conducted at the Google Airline Summit, 2017.

19 AppAnnie, 2015 to 2016, download of VR apps Android and iOS.

Exhibit 19

Three technology-driven trends are transforming customers' experience



SOURCE: Interviews with McKinsey technology and industry experts; Google; KLU

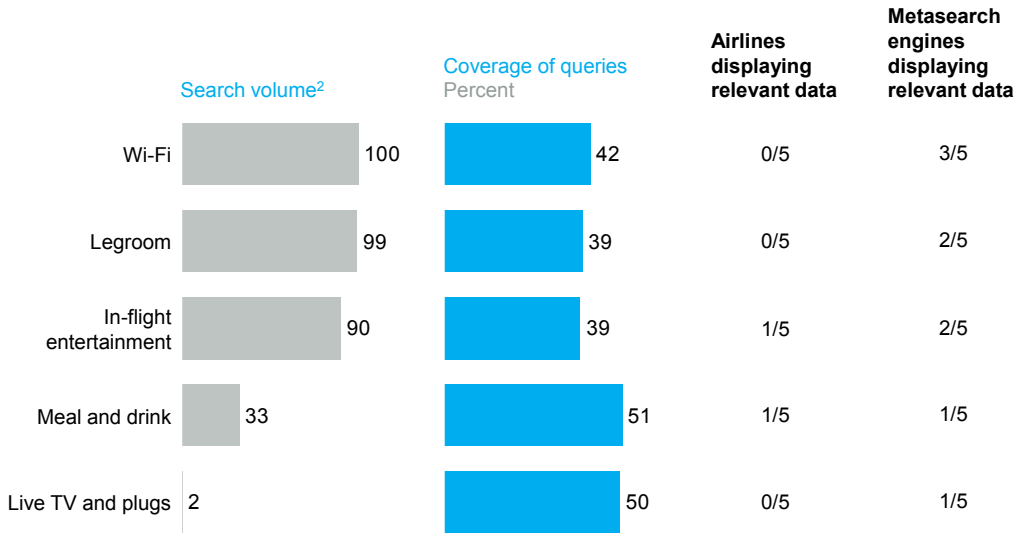
Advanced analytics will also give customers more transparency about features that are important to them, such as legroom or the availability of in-flight entertainment and Wi-Fi. These are among the product features most frequently searched for online, yet fewer than half of the metasearches we conducted offered such detail, and only a small number of airlines did so (Exhibit 20). This is partly due to a lack of data and shared standards for exchanging that data – something IATA aims to improve.

Transparency is already increasing, driven primarily by metasearches. Now, therefore, is the time for airlines to start making more data available on their own channels or sharing it with aggregators to differentiate themselves.

Exhibit 20

Flight features are often not displayed online

Indexed searches for selected flight features[1]



1 Among a sample of 5 major European airlines and 5 leading metasearch engines
2 Excluding pricing. Search volume relates to searches on Google's platform in 15 European countries, 2017. The numbers are indexed, such that searches for information regarding the most searched for feature (Wi-Fi) = 100

SOURCE: Google

Finally, intermodal booking features will become more commonplace. New players, such as CombiTrip and Rome2rio, are already experimenting with helping customers book train rides to and from the airport. This kind of feature is still in early development but could attract customers who seek a simple booking process and transparency on the full cost of a trip, and ultimately raise customer expectations and sway booking choices. Today, if a passenger misses a flight because of a late train, the airline does not have to provide an alternative. In future, an airline that offers a more comprehensive travel experience and is also willing to take on extra risk, might stand out from others.

2. Travel assistants

Digital assistants capable of making and personalizing suggestions will be central to the customer experience, offering comprehensive support throughout a trip and opening new revenue pools for airlines in the process. Already, 69 percent of travelers[20] are more loyal to a travel company that personalizes their online and offline customer experiences.

20 Google/Ipsos Connect, April 2016.

Early versions of digital assistants already exist. But technological advances will make them all the more useful. Task-based bots can support customers making transactional requests (such as “when is my flight?” or “send me my boarding pass for today’s flight”) and might be able to take over certain tasks, such as checking in, unprompted. Fully-fledged travel assistants will use customer data to deliver a still higher level of service. For example, when booking a trip, the assistant might ask if the customer wants to book for family members too, or suggest an additional service based on past preferences. The assistant could also contact airlines and hotels automatically to pass on customer information, such as payment data or dietary requirements.

Some airlines are already experimenting with text-based travel assistants, but voice-based digital assistants in the industry remain rare. Airlines should not, however, underestimate their importance. Already, about 20 percent of all mobile online searches are conducted via voice. Some leading airlines have responded by using software to integrate their offer into third-party voice-based assistants, rather than developing their own. The number of hardware access points is increasing: sales of these devices rose more than 300 percent between 2016 and 2017, to 32 million units.[21] Strong growth is expected to continue.

To launch digital assistant functions, air travel companies will need to structure their data pools and bridge their various data silos in ways that ensure assistants have sufficient data with which to work. Voice-enabled assistants need substantial amounts of data to be able to proffer useful and personalized suggestions. That is because a typical web application presents the user with dozens of options in response to a search request. A voice-enabled assistant can offer only one or two. Airlines will also need to decide which touchpoints they would like to support. In doing so, they should consider their technical capabilities, customer needs, and whether their own services are attractive enough for users to install dedicated apps, or whether they should partner with a third party.

3. Continuous customer engagement

The third technology-enabled trend is toward continuous customer engagement. Digital assistants, mobile devices, and data can be leveraged to capture a greater share of customers’ share of mind not only before making a booking, but also during and after the trip, helping to counter the commoditization of the industry. The flip side of continuous engagement, however, will be higher customer expectations, especially for full-service carriers. Customers will expect airlines to be more aware of their needs and meet them, perhaps offering small delights throughout a trip.

To profit from this trend, airlines will have to capture more customer data, such as meal preferences or telephone numbers, so that they know which meal to serve or can immediately identify a caller on a support hotline. Data on why a customer is making a trip will help gauge price sensitivities and needs, which will differ depending on whether it is for business or pleasure. To tailor an offer exactly to a customer’s needs, airlines must be able to distinguish his or her intentions ahead of time – by knowing which channels are typically used at what times for which kind of trip. It will be no small task bringing all the relevant customer data about social media usage, loyalty programs, or flight capacities together, as many companies, not just airlines, will find it resides within different departments.

21 Strategy Analytics – Smart Speakers, 2018.

Airlines should also bear in mind that customer engagement extends beyond the flight. In this respect, airline loyalty programs continue to be important, albeit their interfaces, particular mobile ones, are still open to improvement. But customer engagement will increasingly take place on social media, review portals, and other travel-related websites, and in collaboration with other companies, be they transport companies or hotel chains. Right now, airlines have an excellent opportunity to be the first to establish close partnerships with relevant operators and to deliver clear benefits to customers.

***

The same technologies that provide air travel companies with the opportunity to improve customer service also enable them to optimize their operations and lower costs. This has been extensively covered in other publications[22] and is not the topic of this paper. Rather, it strives to demonstrate how air carriers can differentiate themselves from competitors and defend themselves against the rising commoditization of the industry by adopting new technologies in their customer-facing activities.

This does not guarantee success forever. As more companies digitize and customers' expectations continue to rise, more rounds of price competition for ever-more sophisticated products could occur. But those that fall behind the digitization curve will surely see the further commoditization of the services they offer today, and might not have the opportunity to develop the value-adding ones of tomorrow.

22 Information on how companies can use emerging technologies to improve their internal operations and on many other digital issues can be found at: https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights

A sea change

The trend toward digitization in ocean cargo and freight forwarding is unstoppable. Incumbents need to keep pace.

Digital interactions between companies and their customers are no longer chiefly the territory of consumer-focused industries. Where these industries have led, B2B sectors are being forced to follow. In the logistics industry, ocean carriers and freight forwarders are among the sub-sectors finding that their customers increasingly seek them out online, with the number of Google searches for relevant terms growing on average by 8 and 14 percent a year respectively between 2014 and 2017.

This growth is driven largely by small and midsize companies that require relatively straightforward products and want to find and compare prices and book and manage shipments online, according to the experts interviewed for our research. The statistics prove the point. Search requests for 20-foot containers, for example, have doubled since 2012 – a proportion of searches that is about 16 percentage points higher than the 30 percent that might be expected given the container capacity in circulation.

By contrast, searches for refrigerated (reefer) containers, which typically entail more interactions between shipper and carrier, have grown by only about 4 percent a year. The reason lies in the complex logistics needs of larger customers. To meet these needs, ocean cargo carriers and freight forwarders traditionally rely on personal relationships established by frontline sales staff. The prevalence of long-term contracts and the complexity of supply chains also explain why online sales and service channels have so far not been a priority for the logistics industry.

This needs to change, for two reasons. To begin with, such channels would enable carriers and forwarders to serve small and midsize customers faster and at lower cost, and offer new, value-added services. More compelling still, perhaps, is the fact that the trend toward digitization of the ocean cargo and freight forwarding businesses is unstoppable, and those that fail to keep pace will surely flounder.

Two major developments are powering this trend. The first is the emergence of digital newcomers offering solutions for narrow elements of the value chain. Some, such as the digital freight-booking start-up Convoy, increase price and market transparency. Others, like TRAXENS, provide shipment visibility across the entire value chain through the use of sensors attached to containers.

The second development is the emergence of e-forwarders, such as Flexport, that offer traditional freight forwarding services supported by digital processes and customer interfaces. Automated back-end processes for aggregating data from logistics partners or handling invoices, for example, have the potential to reduce these companies' intermediary costs to a level between 8 and 13 percent[23] below those of incumbents that retain more traditional processes. Their size still puts them at a cost disadvantage in terms of purchasing capacity, however. In 2017, even the biggest e-forwarders handled only about 50,000 twenty-foot

23 According to the McKinsey Global Institute, productivity in sales and customer service can be increased by up to 30 percent through the increased use of automation. This assumes that 30 percent of sales and customer service today consists of data entry (high automation potential), 30 percent stakeholder management and the application of expert knowledge (low potential), and 40 percent other management work (very low potential).

equivalent units (TEUs) a year, less than 2 percent of the volume handled by the largest incumbents. And most still rely on traditional sales visits to acquire customers, enabling incumbents to maintain an edge. Thus it is small to midsize customers, that do not necessarily require face-to-face interactions, that offer the greatest potential for the new digital players; Flexport states that this is its fastest growing segment.[24]

Nevertheless, the presence of start-ups is forcing other carriers and forwarders to digitize to stay ahead in a highly competitive industry. Importantly, they are raising customers' expectations as they invest in user-friendly, information-rich customer interfaces that incumbents often struggle to replicate owing to their reliance on legacy back-end systems.

These developments are being supported by a surge of venture capital: by 2017, investments in the logistics industry had reached USD 4 billion, about 25 times higher than in 2012.

Most incumbents are responding, digitizing their front- and back-end processes extensively. Many, however, have been slow to make significant changes, missing opportunities to protect themselves against the heightened competition and to profit from new sources of value creation. Here we discuss the short-term, customer-facing operational actions ocean carriers and freight forwarders can take to benefit from digitization, as well as the longer-term technological developments that will transform the customer experience and that companies should learn to embrace.[25]

Operational actions

There are three operational measures companies should consider adopting to meet rising customer expectations and competitive pressures.

Understand and meet your customers' online needs

As already stated, customers of ocean carriers and freight forwarders increasingly go online to search for services. Importantly, search terms directly associated with ocean cargo are about 35 percent more common than terms related to freight forwarding (air or ocean), potentially indicating a desire among customers to skip intermediaries. Track-and-trace solutions and schedule information, often for specific ports, are among the top three search terms for all major carriers, with searches growing by a factor of 2.5 over the past five years.

Most carriers have reacted and feature track-and-trace functionality and schedule information on their websites. But potential customers landing on those sites are likely to be disappointed if they want to conduct any business online. As shown in Exhibit 9, only 6 percent of the largest ocean carriers and freight forwarders have end-to-end online booking capabilities. Some 38 percent of the former and 5 percent of the latter do not even offer online quotes, let alone online bookings. Of those that do, most simply facilitate a request for a quote online, which is followed up with an e-mail or phone call, often a day or more later.

In contrast, new online companies, such as the ocean freight booking platform Kontainers, advertise their ability to provide instant quotes and booking capabilities. Typically, they show tariff rates (freight-all-kind, for example) online that customers can book directly, while also

24 Atlanta Business Chronicle: "Flexport scores economic incentives from city to put $100 million Southeast operations hub in Atlanta," July 11, 2017.

25 The same technologies that enable companies to improve their service would also enable them to optimize their operations and lower costs. This topic is not the subject of this paper.

offering to negotiate rates with carriers if required. Often, they take online payment, which in an industry renowned for slow payment benefits carriers and reduces paperwork.

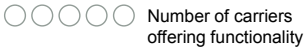
Ocean carriers and freight forwarders should take their lead from the new players by offering instant online bookings with tariff rates, and enabling registered customers to book and manage their freight online according to the terms most will already have negotiated. This kind of end-to-end website booking service, from registration to securing a quote and ultimately an invoice, would reduce costs as well as meet growing customer expectations. Indeed, those without such a facility could be overlooked.

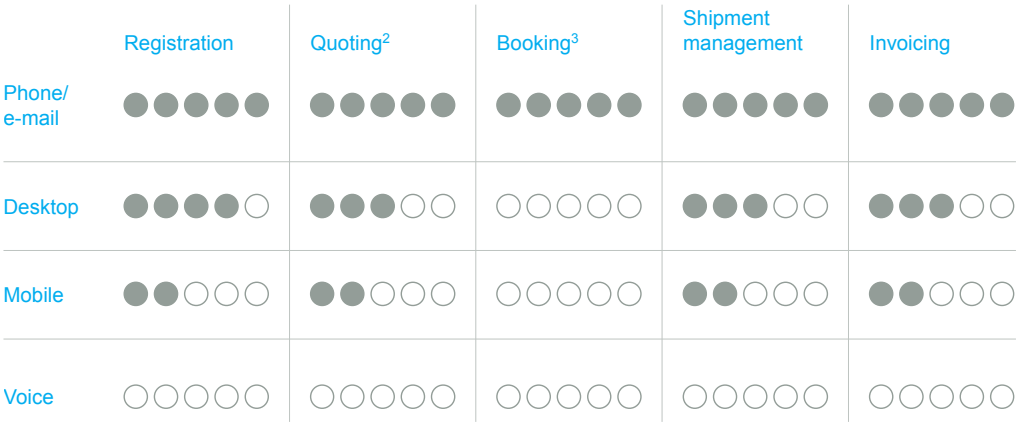
Exhibit 21 demonstrates how far many ocean carriers still are from delivering a smooth end-to-end online service. More often than not, customers can use their desktops or mobile phones for only part of the customer journey, and have to switch to phone calls or e-mails for other stages. These are the breakpoints at which companies risk losing frustrated customers who discover, for example, that quotes recently given online will not be visible to sales staff to whom they speak on the phone, or that they have to give the same basic information more than once.

Exhibit 21

Online and offline functionality for ocean carriers – offline is the norm

Selected ocean carriers[1]





1 5 leading carriers
2 Online quote request, but response not instant
3 Instant confirmation

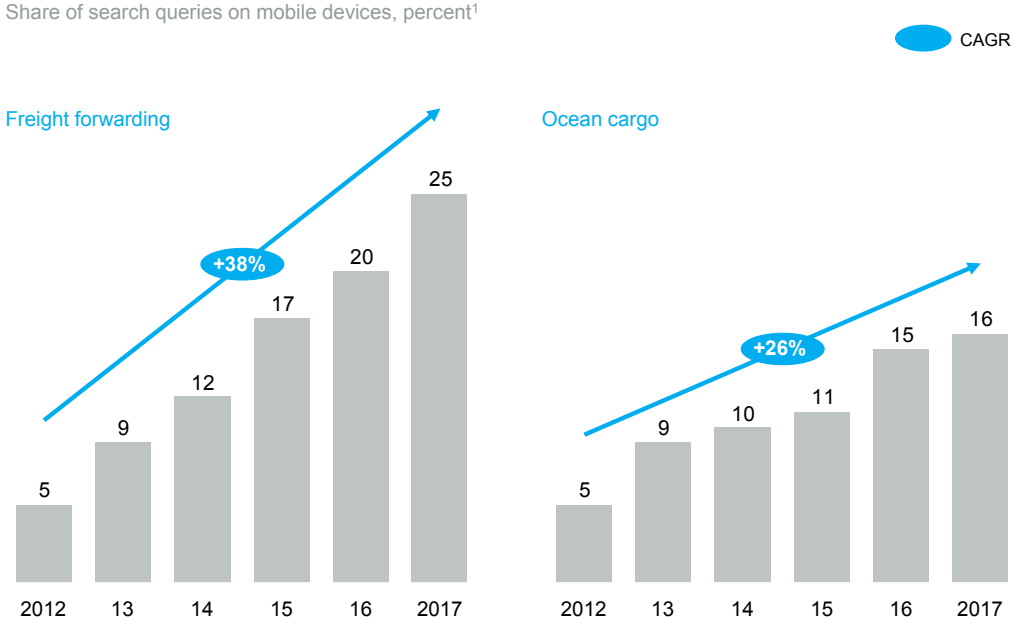
SOURCE: Company websites; company correspondence in Q3/2017

Customers' mobile interactions are an important consideration. In 2017, about 25 percent of queries relating to freight forwarding were made on smartphones. The equivalent figure for ocean cargo was 16 percent (Exhibit 22). The share of mobile searches in the United States was 3 to 9 percentage points higher, indicating that mobile search volumes are likely to grow in Europe – a trend that seems to have gone largely unnoticed by incumbents. Mobile-optimized web content and a consistent customer experience across different devices are uncommon, especially for interactive features such as schedule requests. By contrast, new market entrants

Exhibit 22

Mobile's rising share of search queries shows need for better mobile content

Share of search queries on mobile devices, percent[1]



1 Search volume on Google's platform in 15 European countries. A collection of key words was used to categorize searches by industry

SOURCE: Google

are often mobile-focused, ensuring, for example, that customers' warehouse staff can check the status of a cargo pickup truck on their tablets from the shop floor.

Drive customers to the new online channels

Once carriers and forwarders have soundly functioning digital channels, they will need to drive customers toward them. Although shipment-related searches are increasing, and almost all employees in any industry today use the Internet to research potential B2B transactions,[26] online advertising by ocean carriers and freight forwarders to attract customers to their websites is rare in Europe, where only about one-third of the advertising slots Google allocates to ocean cargo and freight-forwarding terms are used. In the United States, the figure is closer to 50 percent and the typical cost per click – the amount an advertiser pays when a user clicks on a promotion – is three to four times higher than it is in Europe.

There is plenty of scope for forwarders and carriers to coax customers to their websites. Consider, for example, the strong growth of schedule-related online searches in both subsectors, and the fact that many of these searches do not include brand names. Search-related advertising could sway the undecided, although of course the decision to invest in online marketing will differ by company, depending on the typical customer lifetime value and the margin of its business.

Measure and drive conversion rates

Once more users visit a company's website, the next step is to convert as many as possible into customers. Analysis of customer behavior can indicate where problems might lie and potential sales be lost. For instance, if customers are spending a long time on one step of the

26 Think with Google: "The Changing Face of B2B Marketing."

booking process, it might be possible to reduce the number of input fields, present options more clearly, or simplify the language. High dropout rates suggest that users have not found what they are looking for – door-to-door transportation, say, instead of port-to-port offers.

Incumbents can often learn from the simplified online forms offered by new entrants. These focus on the most frequently required user inputs, support users with suggestions, and guide them through the process in small, easy-to-understand steps. When more detailed or complex inputs are required (for dangerous goods, for instance), customers see the relevant fields only on request.

Improving page-load speeds can also raise conversion rates. Analysis of the websites of 33 large ocean carriers showed that more than half took 13 seconds or more to load on a typical mobile device while 20 percent took more than 20 seconds, even though long load times are strongly related to dropout rates. Typical improvements include loading the most relevant information on a page first or using modern web standards to streamline the data exchange between customers and web server.

Companies must also learn to measure the success of their promotion campaigns. By linking data about users' online behavior with sales rates and, where applicable, click rates, carriers and forwarders can see whether a campaign is earning a return on its investment. Successful campaigns can be extended to further geographies. Others can be improved or discontinued.

Three transformative technology-driven trends

The sidebar, "Technologies shaping the travel and logistics industries," describes 11 important emerging technologies. To understand their influence in the ocean cargo and freight forwarding sub-sectors, we asked experts to consider how they would transform companies' offers to customers and the customer experience. They felt that advanced analytics, machine learning technologies, and the IoT stood out for the ways in which they would, for example, improve yield management and, by providing detailed information about port delays, enhance scheduling. They also cited 3D printing as a potential game changer in terms of total volumes shipped, albeit not in the short term.

When we analyzed all the experts' responses, we were able to identify three clear trends that will enable companies to improve their services via technology and potentially resist commoditization: smarter pricing and more tailored solutions, increased collaboration along the value chain, and expansion of data-driven products and services. Each trend, and the underlying technologies, is shown in Exhibit 23.

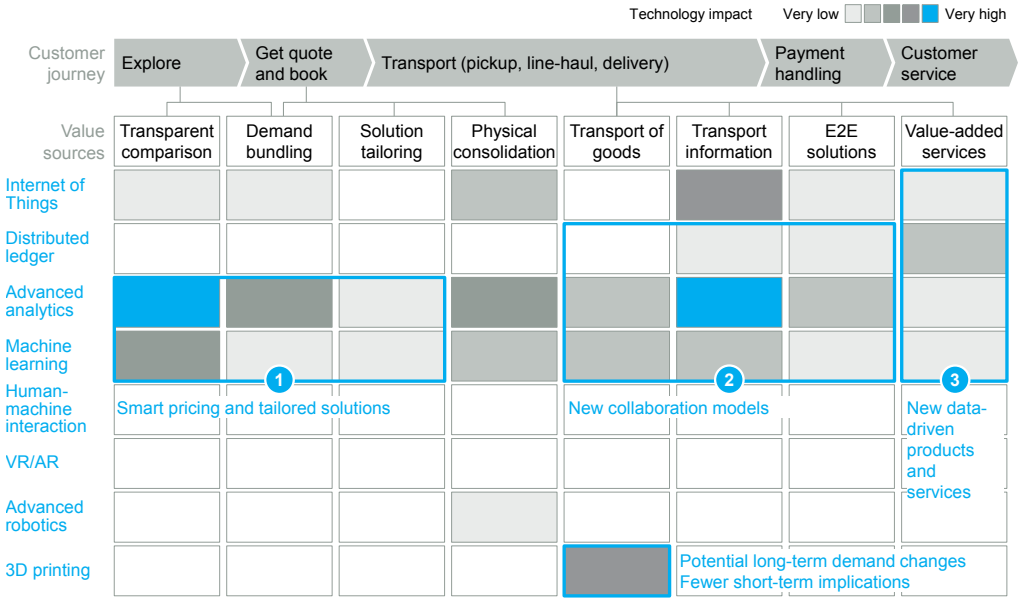
Smart pricing and tailored solutions

Advanced analytics and machine learning offer ocean carriers and freight forwarders new opportunities in terms of pricing and tailored solutions. Yield management can be improved with macroeconomic data and insights into specific customers, enabling carriers to publish rates across channels optimized to improve total margins. And data on historic shipment patterns can be used to offer attractive deals on underused capacity and enable customers to choose online their preferred inland mode of transport and routing, depending on price points and transit times.

These technologies are already being used to offer more transparent pricing. Xeneta, for example, uses smart data agreements and advanced analytics to provide current spot market

Exhibit 23

Three technology-driven trends will transform customers' experience



SOURCE: Interviews with McKinsey technology and industry experts

rates for port-to-port pairs. User-friendly, state-of-the-art interfaces add to the potential threat companies like this pose to conventional freight forwarders.

New collaboration models

There is ample room to improve the efficiency of the complex supply chains that link shippers, freight forwarders, ocean carriers, customs, and terminals in ways that benefit customers. A recent case study of Maersk's activities showed that a single shipment can involve as many as 200 documents and 30 entities.[27]

New technologies will enable an unprecedented degree of collaboration between stakeholders. The potential is already such that between 2011 and 2016, USD 2.2 billion of venture capital was invested in companies aiming to improve collaboration across the supply chain and expedite the flow of documentation[28] – the biggest investment domain in the logistics industry over that period. The proposal by the recently launched New York Shipping Exchange to standardize digital contracts between carriers and shippers is an example of the value that could be delivered. If successful, shippers will receive guarantees that their shipments are being given the promised levels of service rather than, say, being delayed due to overbookings. They will be able to plan more accurately and reduce stock levels, while carriers will cut no-show rates, which currently stand at about 25 percent and hinder the effective planning of capacities.

Blockchain-based solutions deliver value through greater transparency. The start-up modum.io, which combines the use of sensor devices with blockchain technology, issues smart contracts

27 Maersk: "Can the Cloud Lift Global Trade?" 2015.

28 Based on PitchBook data.

to shippers and carriers that are fulfilled only if temperature-controlled goods have stayed within defined limits throughout their journey. Others, meanwhile, are using blockchain to ensure that all shipment-related documents are visible to their stakeholders and can be amended only with the consensus of all relevant parties. The greater transparency this brings to the supply chain will help enormously in an industry in which paperwork is relied upon to log the safe passage of valuable goods.

There are more opportunities for collaboration with terminals and ports. Our analysis suggests better information on the availability of berths and pilots could help carriers optimize steaming speeds and save up to 2 percent of bunker, while better data on congestion at terminals could help cut waiting times for trucks.

Models like these might improve margins for those able to offer customers a more reliable service. But collaboration can also shift profit pools between industry players. For example, freight forwarders, which currently rely on coordinating other operators, could be vulnerable. In a digital world, those that outperform are those that have more and better data with which to launch services, and those that set standards for the exchange of data. In the world of freight forwarding and ocean cargo, it has yet to be decided which companies or organizations will dominate.

New data-driven products and services

Just as new technology ushers in improved ways of working, so it will create value-added products and services.

Those prepared to invest to modify containers, systems, and fleet could offer end-to-end shipment visibility – perhaps to pharmaceutical companies whose temperature-sensitive products need constant monitoring. And better links to terminals and truckers mean that ocean carriers could, for a price, prioritize the loading and unloading of customers' containers. Add smart, blockchain contracts that track fulfillment of these higher service levels and the offer becomes more valuable still.

New insights based on data about customers, assets, and others in the supply chain such as terminal owners and trucking companies could also be used to create services. A subsidiary of Kuehne + Nagel, for example, sells estimates of global trade volumes and industrial production based on data from its own data pools and those of third parties.

Freight forwarders are in a particularly strong position to offer such data-driven products and services given what they know about customers' shipments. Shippers typically use many carriers, all yielding different data on different interfaces. A forwarder could deliver a hugely valuable service were it able to give a shipper a single view of the status of its shipments with all carriers. Data analysis could help it to offer still higher value-added services, perhaps by noticing that a consignment of important manufacturing parts was delayed at sea, and suggesting that a similar consignment en route to a port be diverted to an airport instead to prevent a shutdown on the production line. Indeed, companies that provide real-time information on shipment status have attracted considerable attention from venture capital firms because of the repercussions for companies that too often have no idea how long their goods will be stuck at sea. Excluding the USD 2.4 billion acquisition of Fleetmatics, USD 1.3 billion was invested in these companies between 2011 and 2016.[29]

29 Ibid.

For the time being, development of many of these solutions is being held back by a lack of industry standards, as well as by the cost of transmitting data in remote locations where there might be no mobile networks. But the challenges are not insurmountable. For example, companies offering remote monitoring solutions have started to strike agreements with carriers to use their ships' data links. As technology progresses and connected devices become smaller, as data transfer gets faster and consumes less power, and as more innovations such as mesh networks that improve connections emerge, so too will the potential of data-driven products and services.

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The measures we describe can help ocean carriers and freight forwarders differentiate themselves and so resist the rising commoditization of the industry. However, as in the air travel sub-sector, they do not guarantee long-term success. As more companies digitize and customers' expectations continue to rise, more rounds of price competition for more sophisticated products and services could occur. Yet companies have no choice but to keep pace with digitization. If they fall behind, not only will they see further commoditization of the services they offer today, they might also miss the opportunity to develop the value-adding ones of tomorrow.

Conclusion

The starting point for any digital strategy is to understand customer behavior. Companies should ask themselves what changes they already see, and whether their response is adequate. And they should look further ahead and try to discern what the future might hold given technological developments. These are the questions this report seeks to help companies address in all sub-sectors of the travel and logistics industries.

Of course, it is only the start. A digital strategy must also take into account how profit pools are likely to shift as customer expectations rise, certain products and services become commodity items, and newer, higher value-added ones emerge. And it should gauge the pace at which competitors, be they incumbents or digital attackers, will force the change. Here too the report gives a flavor of what to expect. The organizational components of the strategy – IT, culture, and talent – will also prove crucial. But an understanding of customers' online behavior and their changing expectations will be a wake-up call for those companies already falling behind the digital curve, and fuel for those determined to power ahead of it.

Methodology

Our research into customers' online behavior in the travel and logistics industries and companies' response used data generated by Google's search engine platform in 15 European countries: Germany, the United Kingdom, France, Italy, Spain, Austria, Switzerland, Belgium, the Netherlands, Poland, Norway, Finland, Sweden, Denmark, and Luxembourg. These countries represent more than 85 percent of Europe's population and GDP. The data was aggregated and anonymized.

A collection of key words was used to categorize searches by industry and sub-sector and so gauge customer interest. Generic search terms as well as company names were included among the search terms in each category, and the categories were refined with the help of industry experts and machine learning. The number of relevant search terms rises continuously as, for example, new products and companies emerge. Consequently, the defined search terms used in the analysis for this report do not capture all search volumes. Our figures for search volumes have been adjusted to reflect this constant addition of new search terms.

Our findings on technologies and their likely influence on companies' products, services, and interactions with customers build upon interviews with more than 30 experts at Google and McKinsey, and with academics.

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About McKinsey's Travel, Transport & Logistics Practice

McKinsey & Company is a global management consulting firm, deeply committed to helping institutions in the private, public, and social sectors achieve lasting success. For 90 years, our primary objective has been to serve as our clients' most trusted external advisor. With consultants in over 120 cities in over 60 countries, across industries and functions, we bring unparalleled expertise to clients anywhere in the world. We work closely with teams at all levels of an organization to shape winning strategies, mobilize for change, build capabilities, and drive successful execution.

Our Travel, Transport & Logistics Practice works with clients in travel and tourism, freight and passenger transportation, as well as transport infrastructure. With a team of partners, dedicated consultants, analysts, and analytics experts, we work closely with our clients across all functions including operations, commercial, digital, and advanced analytics.

About Google's Travel, Strategic Partnerships Practice

Google's mission is to organize the world's information and make it universally accessible and useful. Since the beginning, the goal has been to develop services that significantly improve the lives of as many people as possible.

The company was founded in 1998 by Larry Page and Sergey Brin; the first Google office was in the garage of Susan Wojcicki (currently CEO of YouTube) in Menlo Park, California.

Today, the headquarters of the subsidiary of the US company Alphabet Inc. is the famous Googleplex in Mountain View, California. Google employs more than 60,000 people at more than 70 locations in more than 50 countries. The colorful and diverse work environment is still a typical feature of Google's offices.

In Germany, Google has been represented for 16 years, meanwhile with three locations in Hamburg, Munich, and Berlin. The German headquarters is located in Hamburg with 500 employees. In total, Google Germany employs more than 1,100 employees (January 2016). Google products are used by billions of people worldwide, from YouTube to Android to Pixel phones (its first #madebygoogle smartphones), to Google Search and Google Cloud Platform.

About Kühne Logistics University's chair for Freight Transportation

Kühne Logistics University – Wissenschaftliche Hochschule für Logistik und Unternehmensführung (KLU) – is a private, state-accredited university located at Hamburg's harbor. Sponsored by the nonprofit Kühne Foundation, KLU offers a broad spectrum of courses and research in logistics and supply chain as well as business management. KLU's international faculty is known for research excellence in logistics, transportation, supply chain management, and related aspects of business.

Prof. Dr. Hanno Friedrich was appointed as Assistant Professor for Freight Transportation in 2015. His recent research focuses on freight transport demand modeling, macrologistics risk analysis, and new business models in logistics.

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