

THE CONNECTED AIRPORT

THE TIME IS NOW

By Nicolas Boutin, Achim Fechtel, Hean Ho Loh, and Michael Tan

This is the first in a series of articles on how airports can orchestrate a digital transformation of the passenger experience and airport operations.

AT MANY AIRPORTS, DIGITAL technologies and services are improving the passenger experience beyond mobile boarding passes and text message alerts. In airports in Copenhagen and Sydney, for example, sensors and big-data analytics measure and anticipate foot traffic flows and help to reduce choke points. Air New Zealand is speeding up the check-in process for customers departing from Auckland International Airport with self-service bag drops featuring biometric technology. Customers scan their passports and boarding passes and then have their identities verified by a biometric camera before sending their bags through the airline's baggage-handling system.

Most airports are conducting digital experiments, and many are putting in place long-term digital solutions.¹ But few are undertaking the fundamental digital trans-

formations that can resolve travelers' frustrations and improve airports' operating efficiency.

The digital transformation of an airport can be a rewarding or risky journey. The dirty little secret of IT projects is that most of them either fail completely or miss their financial or timing targets.² These risks increase with the size of the project. Therefore, any large-scale transformation should be built upon a solid business case that demonstrates how technology can alter airport economics and improve the passenger experience.

Operators will also need a comprehensive view of transformation. Technology provides the skeleton of digital transformations, but the nervous system is equally critical. Operators will need to manage and orchestrate the digital developments of many partners. These include the airlines themselves, security and immigration agencies, retail establishments within the airport, and technology companies and venture-backed start-ups that are helping to

reshape the travel experience. Operators will need to understand the desires and frustrations of travelers—an understanding that The Boston Consulting Group’s recent survey of 1,500 passengers from 56 countries can help inform.

Further, they will need to work in “sprints,” develop “minimally viable products,” and engage in other fast-paced exercises that are at the heart of agile development activities. They will need to train and upgrade talent. And they will need to rigorously orchestrate and manage a multiyear change effort. The time to start is now.

The Need for Digital Transformation

The digital revolution has moved beyond screens and software to alter traditional industries, such as utilities and industrial goods. Executives in these industries generally recognize that sensors, machines, and IT systems can be connected to analyze data, enabling faster, more flexible, and more efficient processes. (See *Industry 4.0: The Future of Manufacturing and Growth in Manufacturing Industries*, BCG Focus, April 2015.) At the same time, many of them struggle to understand how they can create strategic advantage rather than simply sprinkle digital “pixie dust” over traditional processes.

Compared with these industries, airport operators face an additional challenge. While making sure the planes run on time, they are also responsible for the movement of passengers—hundreds of thousands a day in the case of the largest airports—through vast terminals. And many of these passengers are savvy consumers who increasingly expect to conduct the same digital activities during travel that they do at home and work.

Against this backdrop, digital transformation is a required course, not an elective, for airport operators. They should focus their digital activities on two areas.

Improving the Passenger Journey and Experience. By smoothing passengers’

travels through the airport and improving their overall experience, airports can transform travel from a burden into a more pleasant and even surprisingly delightful experience. This is not simply a touchy-feely, nice-to-have option but increasingly a business necessity. Airports’ landing fees and other aeronautical revenues are typically regulated and have been stagnant for the last two decades, despite the growth in air travel. The best chance for operators to increase revenues is on the nonaeronautical side of the ledger—a move that will require strong partnerships with retailers and third-party technology and digital-service providers.

Achieving Operational Excellence and Resilience.

Many airports are already operating at capacity, and it is only going to get worse. Between 2015 and 2034, air traffic will grow at a projected 4.6 percent annually, even faster in Asia, Africa, and the Middle East. These experiences will create delays and degrade the customer experience. At busy airports, the delay of a single aircraft by 30 minutes can ripple through the air traffic system.

Digital and cloud-based tools can help airports create “virtual capacity” through dynamic decision making and resource optimization. By providing greater visibility and flexibility, these tools can help operators preempt delays and recover more swiftly from snafus caused by weather, mechanical breakdowns, and other events. They can also help increase the number of flights, the flow and processing of passengers through terminals, and overall facility management. This approach is less costly and timely than building new airports or expanding existing ones.

Transformation Principles

In our experience, three principles guide successful digital transformations:

- *A clear business case and change management plan are fully in place.* Too often, executives have not clearly articulated the strategic purpose and business case of a project, fully considered its com-

plexity, or thought through the execution challenges, including second-order effects.

- *Quick wins help to fund long-term transformation.* Executives should start with pilot projects that test the capabilities of the organization to conduct sprint exercises and other popular digital-transformation methodologies that come out of the agile tradition. Pilot projects are critical in helping companies make the necessary adaptations to agile and understanding the new talent and capabilities that will be required.
- *Business leaders bring an independent perspective to the selection of new products and systems.* When business and IT leaders work closely together, they collectively avoid making scattered and noncore investments.

Applying these lessons to airports reveals a clear set of strategies and activities for operators to pursue.

The Passenger Experience

BCG’s survey of passengers sought to understand their use of and satisfaction with the technology that they use while they

travel and to identify promising new services. The survey uncovered five key areas that are very important to passengers but typically suffer from low levels of satisfaction. (See Exhibit 1.)

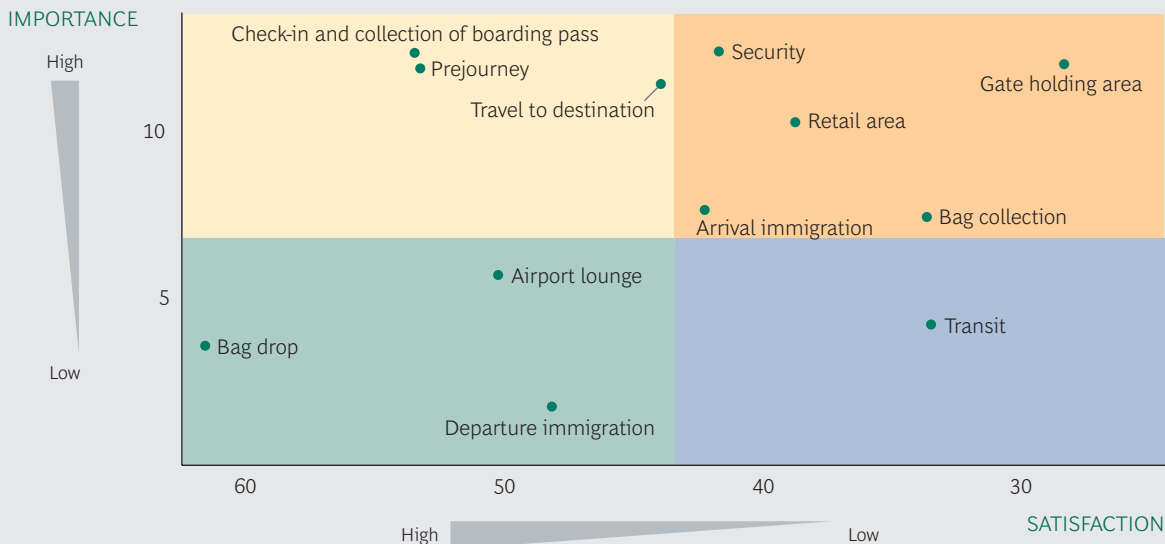
The common denominator across most of these five areas is that airports cannot act alone. They will require the cooperation of airline partners, service providers, air traffic controllers, and other stakeholders. In many ways, airports are similar to large villages, and it takes a village to create transformational change in the passenger experience. The same is true about improving operational efficiency.

Exhibit 2 summarizes proven and potential digital solutions for the five key areas.

Gate Holding Area. Passengers spend an average of 30 minutes at the gate, and they do not like it—not just the wait but also the poor Wi-Fi connectivity and lack of flight updates. Digital solutions could include entertainment options near the gate area, a self-service boarding process, and personalized boarding-time notifications—all of which are within the realm of possibility.

Security. Passengers want shorter lines and great visibility into the length of delays.

EXHIBIT 1 | Five Passenger-Experience Areas of High Importance and Low Satisfaction



Source: BCG’s 2015 airport-experience survey of 1,500 passengers from 56 countries.

EXHIBIT 2 | Proven and Potential Digital Solutions to Improve the Passenger Experience

| TRAVEL STAGE | MAJOR PAIN POINTS | PROVEN SOLUTIONS | POTENTIAL SOLUTIONS |
|--------------------------|--|--|--|
| 1 Gate holding area | <ul style="list-style-type: none"> • Long wait time • Poor Wi-Fi connection • Insufficient boarding-time update | <ul style="list-style-type: none"> • Digital-content kiosks | <ul style="list-style-type: none"> • Digital platform for food ordering • Self-service boarding scanner |
| 2 Security | <ul style="list-style-type: none"> • Long wait time • Insufficient wait-time update | <ul style="list-style-type: none"> • Smart queuing system to notify on wait time | <ul style="list-style-type: none"> • Walk-through security scanner • Precheck programs for frequent fliers |
| 3 Retail area | <ul style="list-style-type: none"> • Poor Wi-Fi connection • Insufficient information updates • Difficulties in “way finding” • Time constraints | <ul style="list-style-type: none"> • Airport mobile app • Wearable-device-equipped airport staff | <ul style="list-style-type: none"> • Location-based promotions • Virtual or robotic assistants • Virtual shopping |
| 4 Bag collection | <ul style="list-style-type: none"> • Long wait time • Lack of collection time updates | <ul style="list-style-type: none"> • Bag-tracking application | <ul style="list-style-type: none"> • Real-time bag tracking and estimation of collection time |
| 5 Arrival immigration | <ul style="list-style-type: none"> • Long wait time • Lack of fast and simple process | <ul style="list-style-type: none"> • Automated border gate with biometric identification | <ul style="list-style-type: none"> • Robotic immigration officer |

Sources: Expert interviews; BCG analysis.

Digital technologies can address both of these frustrations. Smart queuing systems can notify passengers of the shortest lines and estimated wait times. A New York company called Clear lets customers jump to the head of security lines at certain airports by paying an annual fee and having their retinas and fingerprints scanned, for example. Other companies are developing concepts for security tunnels that allow passengers to walk through with their bags without having to undergo invasive and cumbersome searches.

Retail Area. Leisure passengers are more likely than business travelers to spend time shopping at the commercial areas of airports, but leisure and business travelers tend to agree on the same service gaps, which all have digital solutions:

- **Wi-Fi Connectivity.** Leisure and business travelers value Wi-Fi connectivity highly but find existing service levels inadequate.
- **The Overall Food and Beverage and Shopping Experience.** Innovation is high in this area. Changi Airport in Singapore and Dubai Airports are experimenting with apps that allow passengers to preorder items in the terminal

and collect them quickly. Shopkick, a San Francisco-based company, can send personalized promotions to passengers who are near participating stores. Frankfurt Airport just launched an online-shopping platform that allows travelers to pick up their online purchases in airport stores and earn reward points.

- **The “Way Finding” Experience: How Passengers Orient Themselves and Navigate from Place to Place.** A mobile app that provides GPS-like navigation, to gates, security lines, and shops, can address this gap. Airport staff could also be equipped with wearable or mobile devices to help passengers with their navigational questions.

Bag Collection. Similar to the findings in several of the other areas, travelers want to spend less time waiting and have greater visibility into the next step of their journey—in this case, the arrival of their bags. Delta Air Lines and United Airlines both have bag-tracking apps, and the global IT company Unisys is working on a system to notify passengers of an estimated collection time so that they do not have to wait unnecessarily while watching everyone else’s bag spin around the conveyer belt.

Arrival Immigration. Automation is already occurring at immigration lines, with select passengers scanning their passports or fingerprints. Our survey shows that passengers taking advantage of automated features are significantly more satisfied; those who take advantage of automation have an overall satisfaction level that is 54 percent higher, for example, than those who do not.

To further simplify the process, biometric tokens, such as fingerprints or facial features, can be used for all identification-related processes, eliminating the need for passengers to show their travel documents several times during the journey.

Operational Efficiency and Resilience

Operational efficiency and resilience are necessary to address capacity constraints, cost pressures, and travelers' desire to spend less time waiting around airports. This is an issue larger than any single airport. With so little spare capacity, problems in one airport can quickly ripple through the system and cause delays through an entire region.

Traffic and Runway Management. Airport IT systems, air traffic controllers, and airlines do not communicate seamlessly with one another. Often, this inability to share real-time information causes flight delays, long turnarounds, and idle runway time. Technologies such as airliner-sequencing systems can facilitate collaborative decision making to optimize traffic and runway management, reducing runway wait times by up to 50 percent, for example.

Facility Management. Manual processes in maintenance facilities lead to higher labor costs, inefficiencies, and longer downtimes. Predictive maintenance systems can deliver cost-saving opportunities. Equipment sensors can monitor the status and schedule maintenance. DSB, the Danish rail operator, has equipped trains with onboard sensors to help predict, prevent, and recover from operational

disruptions. These sensors would work well in airplanes, too.

Passenger Processing. Airlines use one of several different passenger-processing systems to fit their particular strategic priorities. This leads to inefficiencies at check-in counters and gates as well as to higher operating and maintenance costs. A common cloud-based platform could help reduce costs and increase agility for both airlines and airports. Avinor, which operates 46 airports in Norway, and Perth Airport are moving to such a platform, built by Amadeus, a global travel-technology company.

Passenger Flow Management. The movement of passengers is one of the most critical areas of terminal operation, especially at peak times. Wi-Fi, Bluetooth, and intelligent video technologies can all help to track passenger flows. By feeding this data into business intelligence tools, airport managers can anticipate bottlenecks and address them before they happen.

Making It Happen

In our next article, we will describe more specifically how airports can orchestrate a digital transformation. In the meantime, here are five golden rules to follow in any digital transformation of your airport.

See the big picture. Take the time up front to establish your strategic goals for a transformation. It is easy to get distracted by the "next new thing." You should have a firm understanding of how each initiative serves your strategic endgame and how the initiatives fit together.

Build and follow a business case. Support each digital initiative with a business plan. Cool software and digital tools abound—but avoid the temptation to buy them if they are not critical to one of your digital initiatives.

Overinvest in buy-in. You will be working closely with airlines, technology partners, service providers, retailers, government agencies, and labor unions. Take the time

to build support for your transformation with these stakeholders.

Be open to innovation that is not invented here. Operators need to be willing to partner with technology and other companies that are introducing innovation to air travel. Not all great ideas need to be developed internally.

Invest in people, not just technology. Digital transformations will likely require you to develop new skills in agile, rapid product testing and development, data analytics, and other new fields. Ensure that your people understand the need to transform and have the skills to succeed.

AIRPORTS ARE AT the cusp of a new era, one that will be defined less by what is happening in the air than what is happening on the ground through digital transformation. There is no better time to own the future than now.

NOTES

1. Scott McCartney, "Technology Will Speed You Through the Airport of the Future," *Wall Street Journal*, July 15, 2015, <http://www.wsj.com/articles/technology-will-speed-you-through-the-airport-of-the-future-1436974687>.

2. The Standish Group, Chaos Report, Project Smart, 2014, <https://www.projectsmart.co.uk/white-papers/chaos-report.pdf>.

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