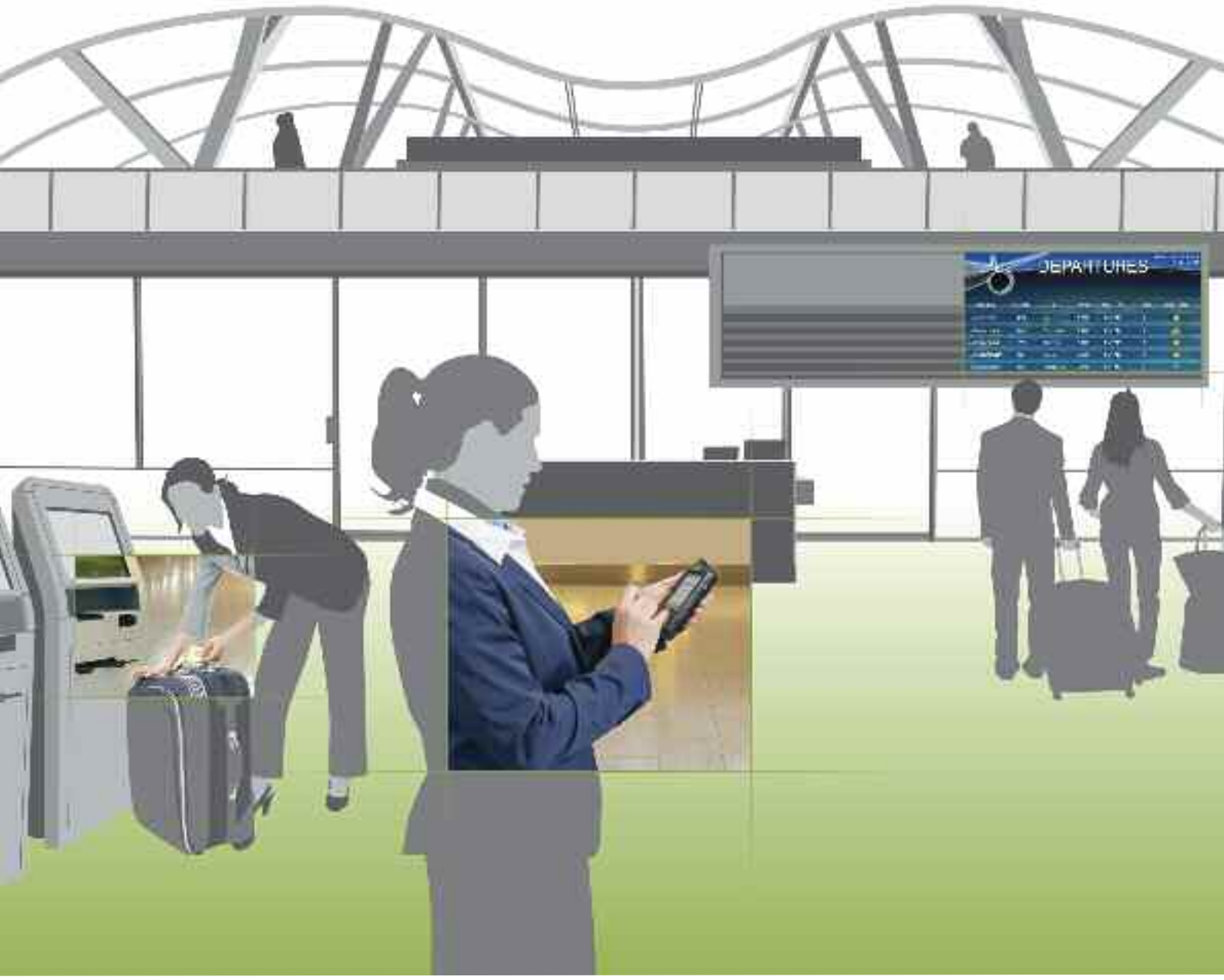
THE INTELLIGENT AIRPORT – UNLEASHING THE POTENTIAL



New Frontiers Paper

SITA

Specialists in air transport communications and IT solutions

Contents

Executive summary

To coin a phrase, *it's the numbers stupid!* When the Wright Brothers got their first plane off the ground a hundred years or so ago, the global population was about 1.6 billion. Today it's close to seven billion and the number of people who flew last year was 2.44 billion. On present trends, global population numbers will reach 9.3 billion by mid-century[1] and the latest IATA forecast is that within three years there will be 3.5 billion passengers[2].

Whatever way you look at it, airport and airspace capacity is under enormous pressure. The cost implications and environmental considerations of adding on new runways and building new airports mean that these are not always acceptable solutions.

At the same time, the low cost revolution and globalization trends are encouraging more and more people to flock to airports and take to the skies. Flow management of aircraft, passengers and freight is increasingly important to balance capacity and demand.

It's often said that necessity is the mother of invention and it's the sheer pressure of numbers on limited airport infrastructure which has driven the passenger self-service and airline shared-use revolutions over the last 25 years. The arrival of online booking, web check-in and check-in kiosks has led to dramatic incremental improvements in the utilization of airport infrastructure by airlines and passengers, but there are limits to the results that stand-alone self-service technology can deliver in a digital age.

Listening to the passenger

Passengers feel those limits the most. Flight cancellations. Flight delays. Mishandled baggage. Queues for check-in, bag-drop, security and boarding. These are the most frequently cited areas of customer dissatisfaction and also add considerably to the cost of doing business.

Improving customer service and reducing the cost of doing business are the key drivers behind the development of the Intelligent Airport vision. This promises to be even more significant than the introduction of Common-Use Terminal Equipment (CUTE) for airline check-in in 1984, or the development of the first online booking engine in 1995.

Future Intelligent Airport scenarios

The Intelligent Airport is one which leverages the convergence of three trends: passenger self-service, mobility and collaborative decision-making – to create a smart predictive environment for the most effective flow of passengers and goods through an airport, both during normal operation as well as during times of disruption. Imagine these scenarios:

- Passengers at airports have all the travel information they need in the palm of their hand through a mobile device/smartphone. This reduces anxiety because they know whether or not their flights will depart on-time, and have confirmation that their bags are safely loaded on the flight. Their mobile device directs them to the shortest path to their gate.
- Airlines and other service providers know the passenger's location on an opt-in basis. Passengers not at the gate for boarding are reminded directly via their mobile device. If advanced analytics predict that a passenger cannot board in time, the passenger is automatically rebooked and bags are off-loaded. The flight departs on schedule.
- Airport operators greatly reduce wait times at security checkpoints, thanks to real-time business intelligence which allows easy deployment of resources to tackle potential bottlenecks.
- Air Traffic Control and aircraft turnaround improve, while flying time is reduced through improved communications between airports and the implementation of an "intranet of the air" or System Wide Information Management (SWIM) – enabling all stakeholders on the ground and in the air to share Air Traffic Management (ATM) data.

About this New Frontiers paper

These scenarios offer a glimpse of the convenience which the era of the Intelligent Airport will usher in.

You can read more about them in this SITA New Frontiers paper. Here, we set out the vision of the Intelligent Airport and discuss the convergence of the key trends that will make it a reality. We consider the way forward. What needs to be done to unleash the potential of airports? What barriers still exist, and what are the practicalities and the lessons learned both within and beyond air transport?

The Intelligent Airport – what is it?

A large supply chain operation

An airport is essentially a large supply chain operation that processes goods and services. It is a time-based processing facility which depends on all its assets – particularly aircraft, passengers, staff and support services arriving and departing, on-time. Improving productivity will be the key driver for the Intelligent Airport.

The challenge is provided by the complexity of players and processes, and the inability of multiple systems to share and analyze data. The airport ecosystem must become more 'intelligent' to optimize its supply chain, share real-time information and track, manage and locate all of its assets. So what will the Intelligent Airport do to provide worry-free travel for the passenger?

The Intelligent Airport is one that knows:

- Who its customers are and when they are travelling, so that it can predict peak demands, minimize queues throughout the terminal, plan staff utilization, optimize parking spaces, and help customers navigate from long-term parking to the plane in real-time. It will also be able to maximize retail revenues by marketing the 'right' products to the 'right' passenger at the 'right' time based on their location and preferences and with their permission (Agility).
- The location of the airlines' planes to reduce delays on the tarmac, minimize fuel consumption and trim turnaround time (Efficiency).
- Where its staff are in real-time, with the ability to communicate to all stakeholders to ensure that the right people and services are on the right flights at the right time, while ensuring passenger security and keeping everyone informed of changes and disruptions (Effectiveness).

Organizational challenges

Growth in passenger volumes – combined with less predictable passenger departure flows due to the rise of remote check-in – have brought new co-ordination and organizational challenges. As a result, airports, airlines, immigration and security agencies need a range of collaborative business intelligence solutions related to passenger and baggage flow management.

Mobile technology offers an unprecedented opportunity for geo-localized tracking, with ground-breaking implications for both the airport and the passenger, from check-in to border management to boarding. It will become commonplace for airports to track and trace the flow of passenger movements, addressing the ineffectiveness and inefficiencies faced today.

More predictive and agile

The Intelligent Airport will be one that is pro-active and collaborative, capable of predicting the flow of passengers to make more informed decisions and communicating information in real-time to all stakeholders, including passengers. With this level of intelligence, airports and their partners will significantly improve their operational performance by having a better behavioural understanding of passengers and how they spend their time, for instance in the security or retail areas.

Airports will vastly improve their forecasting and early warning of delays to improve staff productivity. Distributing that information through various workforce devices will enable airports to become more predictive and agile. Location-based applications will also considerably enhance the efficiency and cohesion of the mobile workforce, from ground handling to improving passenger processing to disruption management.

The Enterprise Passenger Flow Management System

In a significant indication of the degree to which passenger flow is now at the top of the airport management agenda, the Transportation Security Administration of the US Department of Homeland Security put out a tender in April this year for 430 'automated wait time' systems with the ability to display the wait time for the passengers before they enter the queue area.

Passenger tracking for queue management using solutions such as those developed by SITA and Bluelon, the inventor of Bluetooth tracking, is growing fast in popularity as an important tool for improving the passenger flow process at airports. In the SITA Passenger Self-Service Survey 2010, when asked what makes for a pleasant trip, passengers ranked short queues in second place after punctuality.

However, the future of passenger tracking for the Intelligent Airport lies not just in queue management but in what SITA describes as an Enterprise Passenger Flow Management System. This will be capable of providing actionable data on passengers' movements from the time they enter the airport to the time they leave in order to have an in-depth understanding of passenger behaviour throughout the airport and respond appropriately.

Such a system would provide airport operators with a clear view of how much time the passenger spends on non-commercial activities whether it's checking in, queuing for bag drop, security or boarding the plane. It is now well understood in the industry that the more stressed a passenger feels progressing through the formalities of reaching airside in an airport, the less he or she is likely to indulge in any retail therapy upon reaching the shopping areas, thus impacting an important source of non-aeronautical revenues for the airport.

SITA is in talks with a number of major airports about deploying Enteprise Passenger Flow Management Systems tailored to their individual needs and is already embarked on a first deployment with one of the world's leading airports to prove the technology can deliver business intelligence which will benefit both passengers and the airport operator. The final solution involves the deployment of hundreds of Bluetooth and people-counting sensors.

In the future, the Intelligent Airport will be able to track everything from car park usage, to the movement of taxis within the airport, to baggage trolley use and alarm certain activity thresholds, before they become a problem so that the airport operator can respond appropriately, for instance by replenishing the supply of baggage trolleys in a baggage hall or laying on extra transport for passengers exiting the airport.

Why are airports not there yet?

The lack of common situational awareness

What will define an Intelligent Airport will be its ability to track, manage and share real-time information about all its assets and its capacity to optimize the passenger journey, airport processes and decision-making for all stakeholders.

- Aircraft will be tracked to minimize delays, fuel consumption and general turn-around time.
- The mobile workforce will be informed of potential changes and disruptions and be able to react more efficiently.
- Passengers will be recognized, guided through the airport, informed in real-time in the case of delays/gate changes, and if necessary reminded of where and when they should reach a particular point via their mobile devices.
- Baggage will be constantly tracked and traced to improve transfers even from flights that arrive late.
- Runways will be monitored to minimize delays and danger to crews.
- Vehicles will be tracked, allocated and rerouted based on real-time needs.

If these criteria are met, Intelligent Airports will have a common situational awareness of assets and resources across all stakeholders. So why are airports not there yet? In short, it's because they lack this unique, common situational awareness which will take the airport to the next level of efficiency and customer service.

Inefficient overlaps of data and resources

Primarily, it's because systems and processes have evolved independently or with minimal communication, with inefficient overlaps of data and resources. These work to manage specific fields, but fail to address the airport as an integrated time-based supply-chain.

Systems need to be better integrated, real-time information needs to be shared, and communication infrastructure needs to be ubiquitous, because all stakeholders need to work together intelligently and coherently to avoid strains.

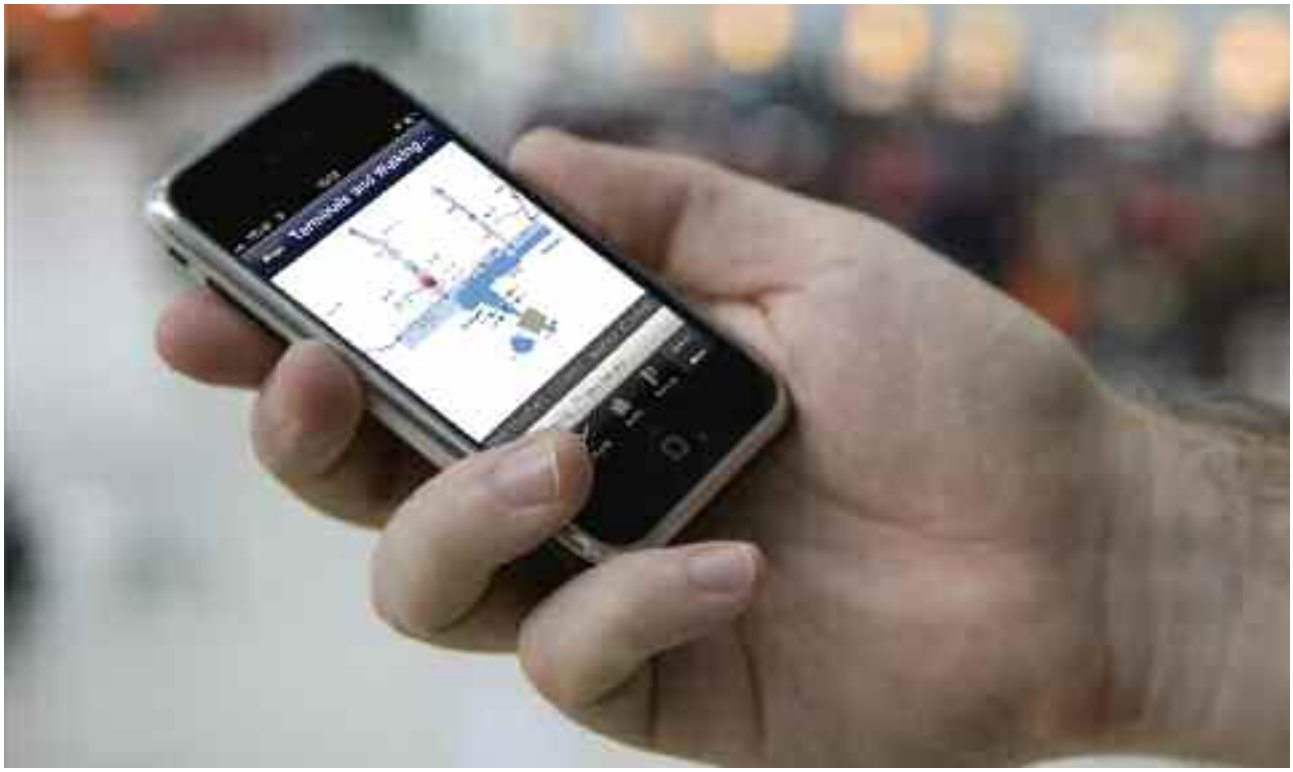
It is now time to rethink the airport as one unified, self-organizing ecosystem, which turns data into actionable information and into decisions. The Intelligent Airport strategy is to bring more transparency to the airport ecosystem by providing an integrated Intelligent Airport Portfolio where data is not only shared in real-time, but also improves decision-making by alerting stakeholders to events and changing patterns based on more accurate predictions and forecasting.

The layers of the Intelligent Airport

To become a reality, the Intelligent Airport vision requires a three-layer approach:

- First, a foundation layer. This will strengthen and reinforce infrastructure with zero downtime, and high-performance sensing technology.
- Second, building on that foundation. There must be a focus on operational efficiency, to improve passenger experience while reducing costs. This needs to utilize solutions which incorporate both the digital traveler and the digital aircraft requirements, with a view to making operations and passenger experience as smooth as possible.
- Finally, as a third layer, business intelligence solutions. These will enable better decisions to be made with the right information at the right time. These decision will be based on the quality data provided by the other two layers, in order to complete the shift to a proactive, Intelligent Airport.

The key trends to get us there



Mobility, the rise of 3G and the promise of 4G

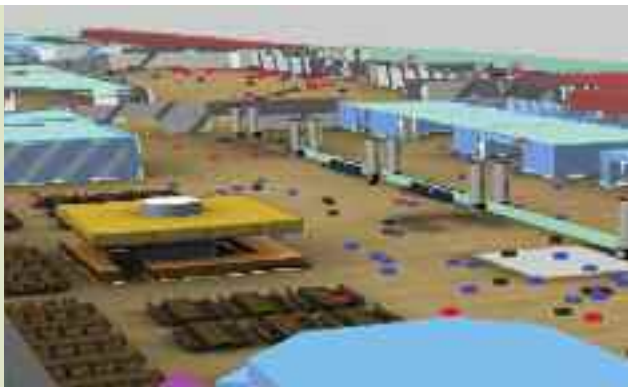
By the end of 2010 there were an estimated 5.3 billion mobile cellular subscriptions worldwide, including 940 million subscriptions to 3G services, according to the International Telecommunications Union (ITU).[3] Total shipments of smartphones last year were 302.6 million, up 74.4% from 2009, making them 21.8% of all handsets shipped and the area of strongest growth.[4] Ovum estimates that 43% of handsets will be 3G-enabled by 2014.[5]

Though the popularity of SMS messaging continues to explode (6.1 trillion messages in 2010), travellers increasingly want to have a mobile device or smartphone which allows them to browse the web and download applications, going beyond simple telephony and texting to mobile computing. The arrival of the iPad in 2010, quickly followed by other tablet devices, supports this trend towards mobile computing among passengers – with 20 million sold to date and Forrester forecasting sales of 82 million in 2015.[6]

Just three years have passed since the introduction in July 2008 of the iPhone 3G and its application platform which unleashed the smartphone/personal computing phenomenon now starting to impact the travel industry in many different ways. The proportion of the population adopting the smartphone in the US stands at 27%; in UK, 33.6%; and Spain, 38%. There are 100 million mobile subscribers in Japan.[7] The SITA/Air Transport World Passenger Self-Service Survey 2010 found that 28% of survey respondents (80 different nationalities) in Atlanta, Beijing, Frankfurt, Moscow, Mumbai, Sao Paulo and Johannesburg airports were carrying smartphones and 23% had experience of using mobile phone check-in, even if only 3% had done so on the day of the survey.[8]

For most airports the future is mobile: 70% of airports plan to offer mobile services by 2013[9]. The rise of task-specific self-service options may have led to airports losing sight to some degree of their passengers, so the advent of smart mobility will provide the Intelligent Airport with direct access to passengers who will expect seamless communications throughout the airport, based on 4G and WiFi technologies providing permanent connectivity. Passengers will benefit from a personalized journey with real-time information and suggestions throughout the airport based on personal details and preferences optionally shared.

Copenhagen 3D Airport Model, showing live view of WiFi devices moving through the airport.



Smartphones will enable passenger tracking technologies to be introduced by 40% of airports to ensure passenger flow monitoring by 2013 which, in turn, will allow resources to be allocated in a pre-emptive way to avoid congestion and reduce queues. More sophisticated use of existing geo-localization technology will allow airports to benchmark with precision how much time passengers spend in different zones of the airport. No smartphone today can support indoor GPS but a number of companies are working on embedding WiFi capability either in the phone cell battery or in the operating system.

Another technology with great promise in the airport environment is Near Field Communications or NFC, an enabling technology which would allow the mobile phone to be used by the passenger for immediate transactions in the airport. SITA and Orange Business Services are currently investigating the issues around replacing the mobile Boarding Pass with an NFC token which would simplify check-in and other airport processes. France-Telecom Orange has announced that 50% of its new European smartphone orders in 2011 will be NFC-enabled. In France, Orange has set a target of 500,000 NFC-enabled devices. Juniper Research has indicated that "around 52 million consumers will adopt new mobile technologies such as NFC and other physical mobile payment methods to pay for everyday goods and services by 2011."[10]

The smartphone can be the key to solving the number one frustration of passengers: what to do during dwell time at an airport.[11] Apart from 56% of these passengers seeking internet access, 26% would like to be able to access entertainment on their mobile phones, while another 25% would welcome digital shopping information and bargains flashed to their phone. These airport-based transactions will be facilitated by the gradual migration from e-commerce to m-commerce. Issues such as entering credit card details will cease to be a problem as new mobile payment alternatives go mainstream. Online retail is among the fastest growing mobile categories in both the US and Europe.[12] In Japan, use of mobile phones in place of debit or credit cards for personal purchases is becoming well-established. For example, in the month of December 2010, 9.8 million mobile users in Japan made a purchase using their "mobile wallet."[13]

According to Gartner[14], smartphones will be the major driving force in the adoption of context-aware applications through 2013; and by 2015, 90% of Global 2000 enterprises with consumer relationships will provide context-enriched applications through mobile platforms. This will be a key driver paving the way for intelligent networks that will enable context-aware computing. More airports will implement geo-location software following the example set by Copenhagen Airport (see page 11), allowing their existing networks to be more intelligent and to pinpoint the exact location of thousands of WiFi-enabled devices, such as mobile phones and laptops or wireless tagged assets including trolleys and baggage.

Self-service to conquer the pain points?

We live in a tech savvy virtual world. One where many people rarely see the inside of a travel agency. If you want to fly though, spending time at an airport is unavoidable. But the passenger experience is undergoing a revolution as every step in the journey is analyzed and scrutinized for possible improvement spurred by the tremendous acceptance of self-service options for stages of the passenger journey.

Nobody is more comfortable with Do-It-Yourself technology than today's air traveller. Actual usage of online check-in is at 61% and kiosk check-in is at 71%. IATA estimates that in two years time, 70% of passengers will use one of three self-service channels to check in: kiosk, web or mobile.[15] Up to two thirds of respondents to the SITA Air Transport World Passenger Self-Service Survey 2010[16] want control over other steps of the journey such as automated security checks and boarding gates (like in a train or metro station). Indeed, the frustrations of passengers today often revolve around the absence of self-service at key points in the journey such as security, boarding, transfer and arrival. According to the 2009 IATA Corporate Air Travel Survey, over 50% of passengers worldwide want more self-service options to speed up their journey.[17]

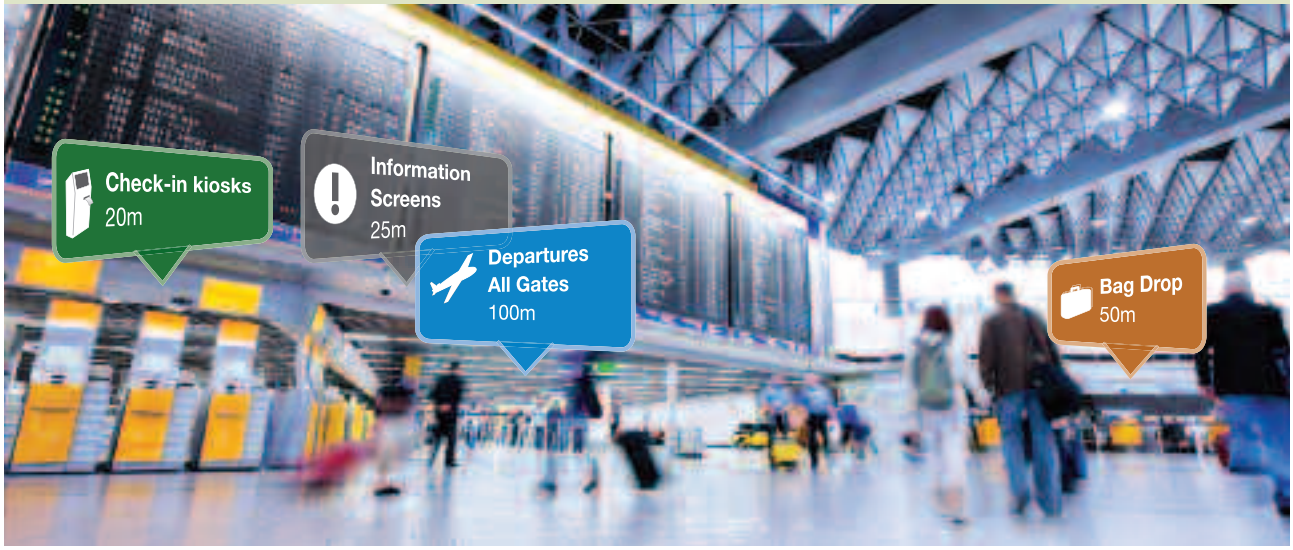
Indoor augmented reality becomes a reality

Earlier this year, Copenhagen Airport and SITA announced that the world's first indoor augmented reality application would be available for passengers to use at the airport. Harnessing innovative technology, the app has conquered the limitations of indoor geo-localization services allowing passengers to use augmented reality to plan their time inside Copenhagen Airport and to get information on gates, shops, restaurants and other services in a fun and interactive way.

Christian Poulsen, IT Director of Copenhagen Airports A/S, said: "As one of the world's leading airports, Copenhagen Airport is always trying to improve the experience passengers have. This exciting way to use new technology gives passengers a new dimension to their stay at the airport which makes it even easier for them to plan their time."

Using the app, passengers can find information on where they are in the airport, what services are available in their vicinity and locate their gate, all by using the iPhone's camera to 'scan' their immediate surroundings. In time, the airport can work with retailers to offer specific promotions to passengers which will encourage more business.

Typically for augmented reality applications, GPS is used to determine the user's location. However, because GPS signals cannot penetrate concrete structures like terminal buildings, this does not work successfully indoors. This app, developed by a combined team from the airport, SITA Lab – SITA's research group – and Novasa, uses triangulation and signal strength from WiFi access points to determine the location of individual passenger mobile phones. In doing so, Copenhagen Airport can now offer its passengers the world's first true augmented reality application that works indoors.



The most significant obstacle to even more comprehensive adoption of self-service check-in occurs for some passengers when they have bags to check-in. This is the main reason cited by passengers who did not use self-service check-in when it was available last year.[18] However, there is the perennial concern over mishandled baggage. Last year the global mishandling rate was estimated to have risen by 6.06% resulting in over 29 million bags being delayed and a US$ 3 billion cost to the industry.[19] Passengers want to have more control over this aspect of their journey. The majority would like to be able to print their own bag tags and be able to file a baggage claim at an airport kiosk.

IATA's Fast Travel 2020 vision sets a target of 80% of global passengers being provided with self-service options throughout their journey saving between US$ 0.8 billion and US$ 1.6 billion across the industry each year.[20] Airports will deploy kiosks to allow passengers to tag their bags, scan their travel documents for onward transmission and validation to meet government requirements, re-book flights and reporting missing bags.

Collaborative Decision Making and Disruption Management

The third pillar of the Intelligent Airport is Collaborative Decision Making (CDM). When it comes to managing the flow of aircraft, passengers and goods arriving and departing from an airport, a CDM framework is vital to ensure real-time dynamic collaboration and decision strategy support across the multitude of stakeholders to be found at any busy airport.

Airport CDM frameworks were put to the ultimate test in 2010, the worst year on record for flight cancellations since World War II. Volcanic ash cloud emanating from Iceland and severe weather meant that over 300,000 flights were cancelled. In the case of British Airways alone, the rosters for 14,000 cabin crew and 3,000 pilots became redundant as snow closed down London Heathrow.[21] Airline schedule recovery is an area where CDM comes into its own, requiring significant data exchange and shared automation tools for airline operations control, air traffic control and air traffic management centres.[22] Ultimately, CDM uses information from all involved operators to create one unique prediction of the progress of a particular flight including progress during ground handling.[23]

Overall, the SITA/Airline Business Airport IT Trends Survey last year found that 75% of the top 50 airports plan to install CDM tools by 2013. Airport CDM platforms seek to combine business intelligence with information and workflows to improve decision-making and ensure it is more transparent and linked to performance. As a first step towards CDM, 54% of airports plan to implement or already have implemented Airport Operations Control Centres (AOCC) which will allow them to obtain critical data from various stakeholders and disparate systems.

Geolocalization will also be a crucial component of future airport development – it will improve passenger flow management, resolving issues created by mobility and self-service, such as identifying passengers who check-in remotely and whose time of arrival at the airport site cannot be predicted, creating chokepoints. The infrastructure network supporting geolocation will have to be unified and able to handle indoor GPS, Bluetooth, GSM, 3G/4G, WiFi, RFID and so forth.

Through the use of business intelligence tools and information, the Intelligent Airport will become more efficient. The Intelligent Airport will 'know what happened', storing valid data from all processes throughout the site to help build accurate models for automation, sharing this knowledge with all stakeholders via real-time dashboards, alerts and reports.

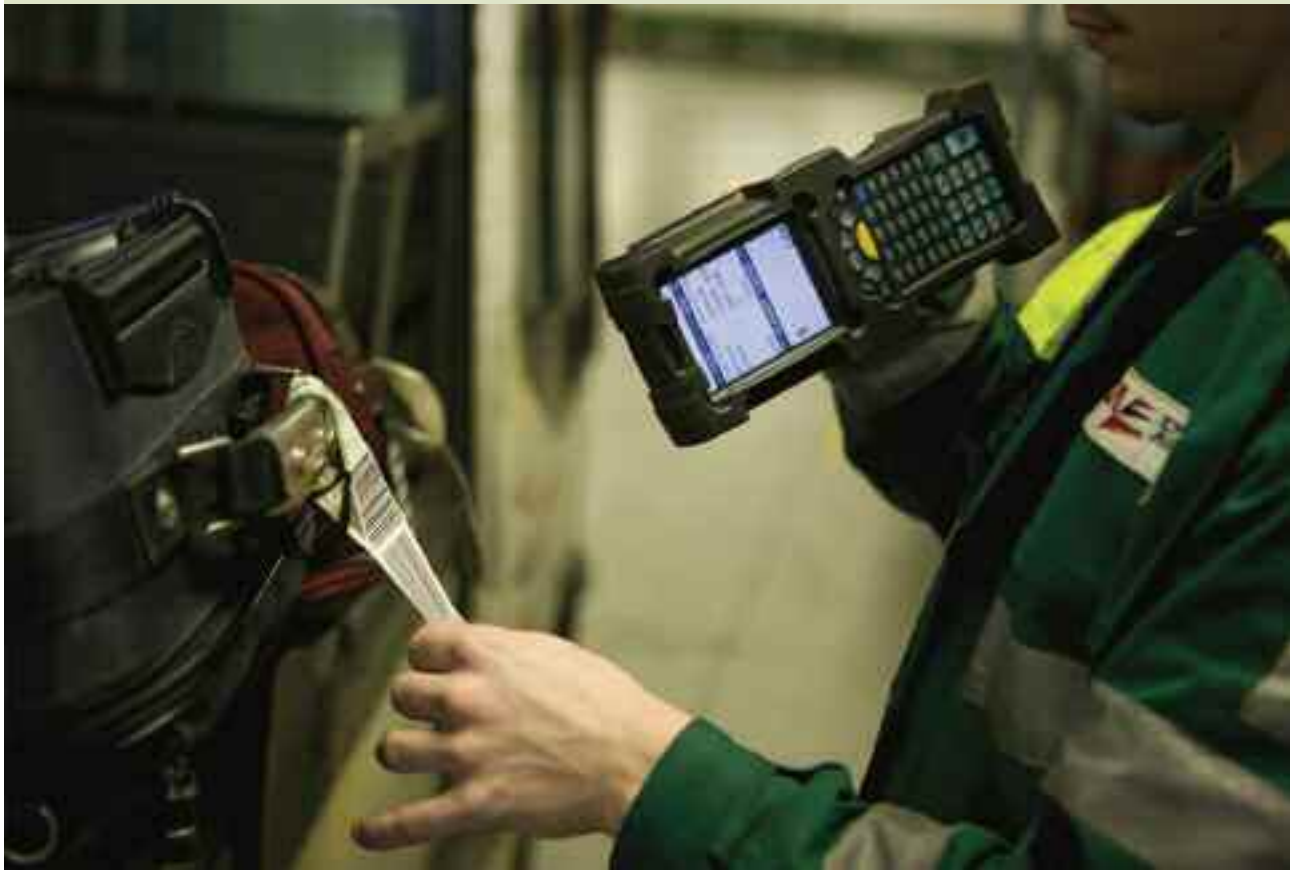
To sum up, CDM will enable the intelligent processing and sharing of complex and high-volume data, which will allow airports and all their stakeholders to make better and faster predictions and decisions, and collaborate in real-time to improve the airport's overall performance through better resource allocation and increased punctuality.

Addressing the pain points

Managing the bag transfer problem
In any given year transfer baggage mishandling accounts for 51% of all cases of mishandling. It is a major focus for IATA's Baggage Improvement Program which aims to cut mishandling in half, saving the industry as much as US$ 1.9 billion. A particular facet of this problem is the number of transfer bags arriving at the transfer airport with no BSM (Baggage Source Message). This usually results in a lot of manual bag encoding, missed connections or bags left behind on sortation belts.

SITA will launch BagConnect later this year. It allows for the generation of a 'pseudo-BSM' to be sent to the transfer airport in order to allow the bag to be sorted to the correct flight. It was piloted in 2010 at Los Angeles Tom Bradley Terminal. Over four weeks the number of manually reworked connecting bags decreased by 50% with a further decrease expected following future developments.

A great part of SITA's vision for the Intelligent Airport is built around real-time information sharing between airport stakeholders using existing data. This is epitomized by the development of BagSmart which will also have a significant impact on mishandling rates by checking real-time Baggage Information Messages against real-time flight messages, taking into account the airline/airport 'local rules' to determine whether a bag is at risk of becoming a mishandled bag, and then providing a processing recommendation to mitigate the risk.



Check-in and Bag Drop

By the end of 2010, over 99% of airports had adopted bar-coded boarded passes (BCBP), an outstanding success estimated by IATA to have saved the industry US$ 1.5 billion per annum. The next step for the air transport industry is to ensure BCBPs go mobile and persuade authorities across the world that a boarding pass on a mobile phone is proof positive that the passenger has checked in and is entitled to board the aircraft without the usual piece of bar-coded paper.

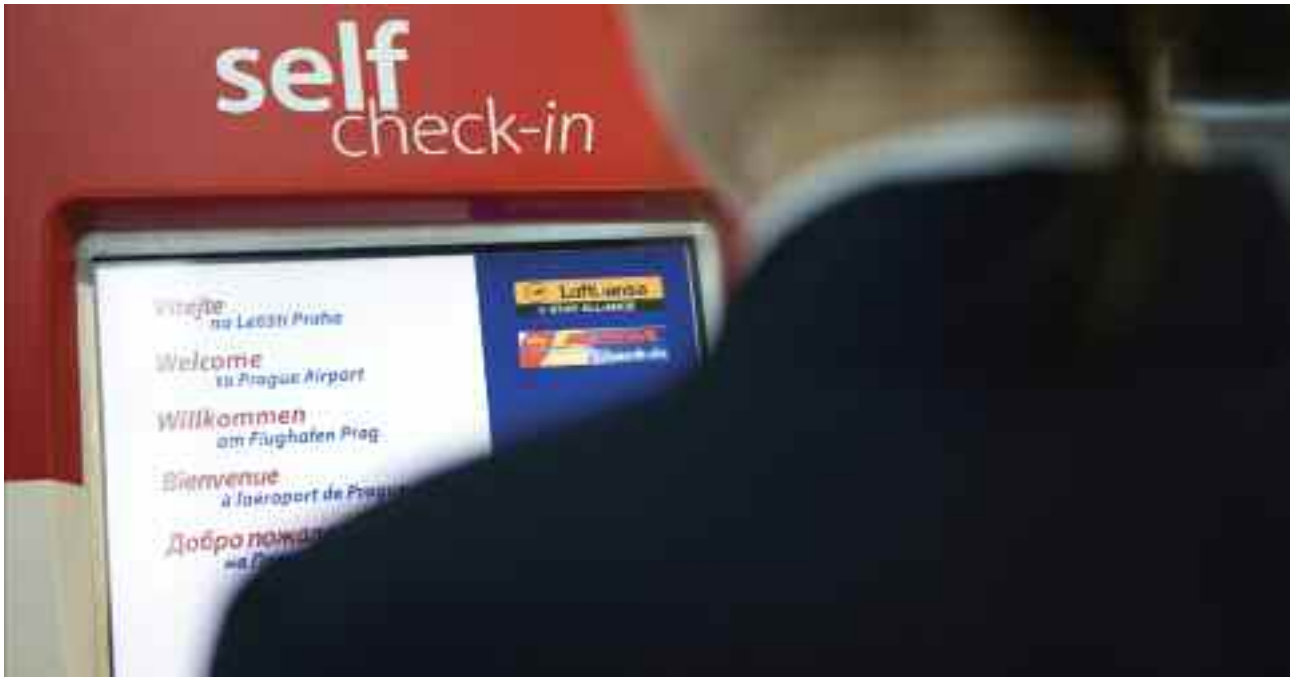
The rise of mobile check-in will contribute significantly to reducing queues at check-in. Most passengers with bags to check-in want unassisted bag drop, which should be as simple as scanning a boarding pass and issuing a receipt as the bag is dropped off.

The IATA agreement on Self-Tagging Recommended Practice means that this is now achievable. Self-tagging with assisted bag drop is being implemented in many airports and has increased throughput of passengers by 50%. Bag drop processing can take as little as 15 seconds and should not be "the long goodbye" that so many passengers dread while standing in line for an agent to take and tag their bags.

Bag drop specialists are working to develop a single customer touchpoint which will integrate check-in, bag tag printing, excess luggage payment and bag drop in one place. This speaks to the growing industry debate on the merits of the traditional check-in process. Air New Zealand provides domestic passengers with seating allocation and boarding passes when they make their booking; passengers without bags simply walk to the gate when called.

The next evolutionary step is likely to be RFID or location-based NFC technology, tracking each passenger's arrival at the airport and automatically checking them in. Meanwhile, Qantas allows frequent domestic flyers to be automatically checked-in when they swipe a RFID-enabled loyalty card which also serves as a boarding pass, and passengers can self-tag their luggage with their own personal chip-enabled bag tag. The success to date of implementation at Sydney, Perth, Melbourne and Brisbane means it is now being rolled out across its network of 21 regional airports.[24]

Automatic check-in is also available on Air France for direct economy flights within Europe or between Europe and Africa for passengers who book through the airline's web site, but there are considerable obstacles still to be overcome for more widespread use of automatic check-in internationally, not least passport and visa verification checks, which requires a biometric-based solution.



Security and self-boarding

Long lines at security are another bugbear for passengers. Security screening is the number one area for improvement among frequent flyers and 70% of all respondents would use automated border controls and security processing.[25]

Real-time queue management applications are coming to market through partnerships between companies like SITA and Bluelon, the inventor of Bluetooth-based passenger tracking, which can flag bottlenecks early on and allow resources to be deployed in good time to avoid excessive delays in security screening areas.

In addition to mobile BCBP, self-service to support passenger flow through the airport will be dependent on intelligent ID management strategies which, in turn, require full-proof passenger identification and verification systems. Biometrics will be crucial to support the growth of self-service for passengers (as well as guaranteeing identification of the workforce).

The advent of electronic documentation such as SmartCard and ePassports will facilitate self-service and offer unprecedented efficiencies and convenience. 27% of airports already plan to implement self-boarding by 2013.[26] A conventionally staffed boarding gate which takes at least two full-time employees, each working eight-hour shifts to provide 16 hours daily coverage, could be replaced by a biometrics-controlled gate providing 24/7 coverage at a fraction of the cost.

Baggage management

Connected passengers with smartphones will be able to receive baggage receipts and other flight and baggage information direct to their hand-held device. Airports and airlines will be able to leverage a passenger's location because of ever-present personal-area networking and sensor technologies, such as Bluetooth and RFID, wireless LAN, and 4G products. A passenger who is not at the gate on time will be contacted directly via their mobile device and instructed to make their way to the gate for boarding. However, if advanced analytics predict that a passenger will not be able to board on time (based on their location), the passenger and bags will be automatically re-booked allowing the flight to depart on-time.

At the same time, CUSS (Common-Use Self-Service) kiosks which support check-in for multiple airlines are expanding their uses beyond check-in to allow passengers to register details of mishandled baggage.

Passenger communication

@HeathrowAirport: Good evening from LHR. #ashcloud restrictions have been lifted & Heathrow is open. For flight information, check with your airline. (via Twitter) Monday May 17, 2010

Last year social media came into its own as an important element in crisis communications for large airports caught up in the travel chaos which followed the shutdown of airspace in the northern hemisphere as a result of an active volcano in Iceland. Twitter and Facebook accounts were used to communicate with passengers in real-time, a service which was much appreciated by the 40,000 or so followers of Heathrow Airport on Twitter, for example.

Facebook is now the most popular web site in the world with over 500 million users. Over 200 million active users have access through their smartphones or mobile devices[27]. This, combined with the fact that over 60% of travellers worldwide use social media related travel sites[28], means that airports cannot afford to ignore social media as a communication channel to their customers and to ensure that it is integrated with mission critical information systems.

48% of airports plan to use social media for disruption/emergency updates, but also to tap into passenger preferences in order to improve the airport experience, for example 52% of airports plan to use or already use their social networks for surveys and focus groups.

As IATA has pointed out[29], the arrival of the BCBP heralds a new era in passenger communication which can be as profound as the possibilities opened up by the dominance of social media. All flight-related information can be sent directly to the passenger's mobile device. All the passenger's immediate airport needs could be accommodated over the mobile platform, whether it's booking a space in the car park, a room in the airport hotel, lounge access, or excess baggage fees.

Passenger communication is key to building and protecting the brand and reputation of the Intelligent Airport. It will also help forge a direct relationship with members of the travelling public and offer unique opportunities for airport tenants and retailers to tap into the preferences of digital travellers for personalized context-aware marketing.

Mobile baggage tracing and management

WorldTracer is the SITA operated baggage tracing and management system used by over 450 airlines and ground handlers which provides continuous tracing for up to 100 days and maintains a global data repository of baggage claims that are pending, settled or closed as a result of a passenger's bag being delayed or damaged. The extension of WorldTracer to mobile devices enables airline staff to assist passengers upon arrival either at the baggage carousel or in the customs hall. Delayed Baggage Reports can be initiated immediately and airline costs can be reduced by dealing with more mishandled bags in a shorter space of time. Passengers can avoid the additional stress of having to queue to make a claim.

Sojourner portal

What traveller en-route to a busy airport in a foreign country would not like to have their own personal concierge guiding them every step of the way? Building on its success with the British Airways mobile portal last year, SITA Lab is extending the vision of a personalized itinerary for each traveller, accessible from any mobile device.

The Sojourner portal is intended to provide useful services to passengers at all stages of the journey, from planning to embarkation. A passenger driving to the airport will be shown route directions and be guided to the nearest available long-term parking space. As the passenger enters the airport, the mobile device will display a map of the terminal building indicating the nearest bag drop, the route to the departure gate, and the time it will take to reach it.

The Intelligent Airport is a collaboration

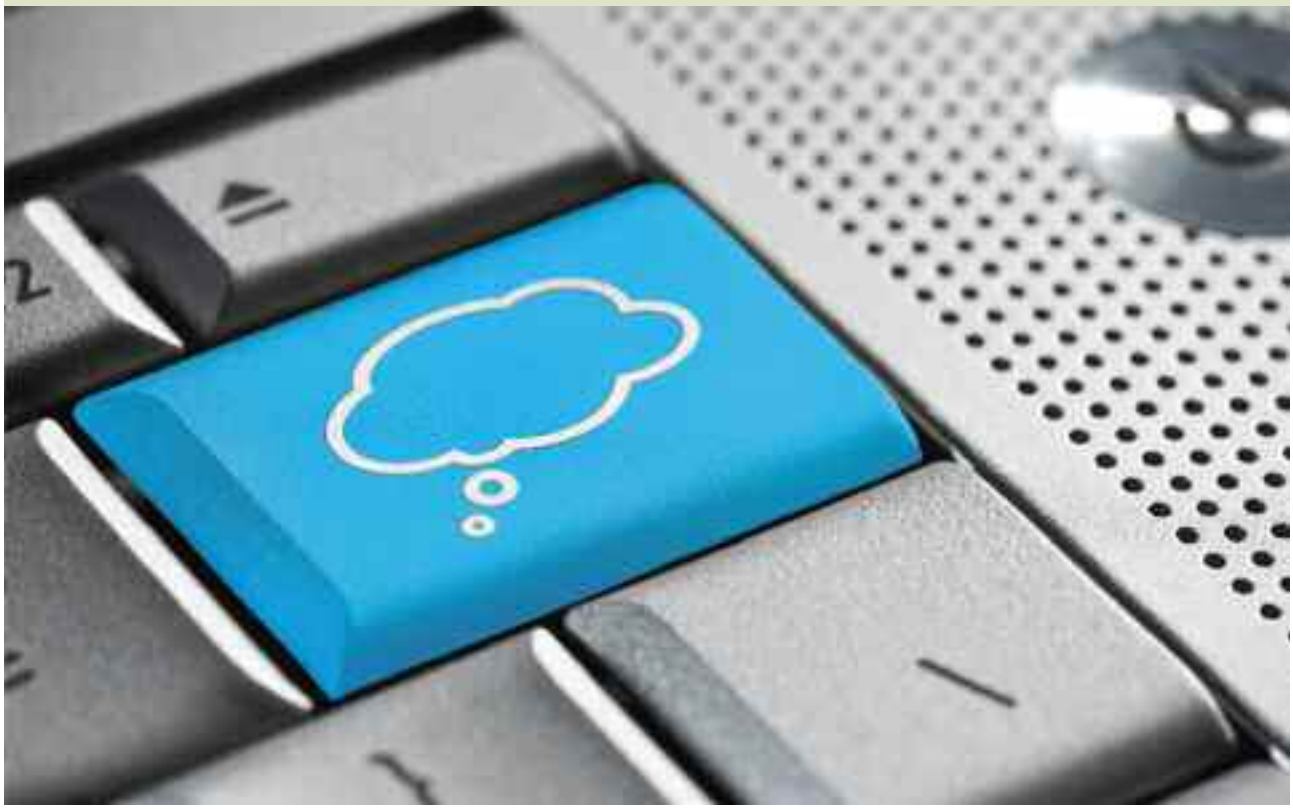
A common airport platform

The Intelligent Airport is a collaboration between people and systems, between airports, airlines and ground handlers with the ultimate goal of moving passengers and cargo from departure to arrival in a safe, hassle-free and timely manner. There is a palpable sense of excitement throughout the airport sector now that it is on the cusp of a great technological leap forward made possible by the rise of CDM and the arrival of the next generation standard for processing passengers, Common Use Passenger Processing Systems (CUPPS), which will allow airports to reduce support costs by permitting the use of one application by airlines in both the proprietary and common-use environments and promote greater uniformity in airport business models.

Collaboration is the hallmark of the CUPPS project. It is the first time that IATA, ATA and Airports Council International have sanctioned a new standard for the industry. CUPPS will facilitate the true integration of airlines' Departure Control Systems (DCS) and Passenger Service Systems (PSS) with benefits for the passenger which will pay off in more efficient check-in and boarding processes, and in other ways such as improved flight information displays and more dynamic signage. CUPPS will eventually replace CUTE and it has been proven and tested by early pioneers at Las Vegas and Orlando international airports.

Air Transport Industry Cloud

The move towards a common platform is also spurred by the arrival of cloud-based computing which has now led to the creation by SITA of the Air Transport Industry (ATI) Cloud. The cloud will provide global consistency and integration of the air transport industry ecosystem and enable the industry's end-users to get simple, cost-effective and reliable access to a large catalogue of applications bringing down costs and increasing efficiency. The Intelligent Airport will benefit from reduced reliance on purpose-built IT infrastructure and enhanced opportunities for collaboration across the cloud. In the future, "only cloud providers will provide the global scale and responsiveness necessary so that enterprises can provide context-aware services that improve the user experience."[30] Download SITA's ATI Cloud New Frontiers Paper at www.sita.aero/content/new-frontiers-papers.



The mobile workforce

The increasing focus of airports on mobility for their own operations centres on mobile-based services and data-capable hand-held devices. A properly equipped mobile workforce is an essential component of an airport's operational tool box and an ideal response to seasonal peaks in passengers and their baggage.

For example, roaming agents using a Motorola mobile device which supports 2G, 3G and WiFi and is fitted with context-aware mobile middleware software, can directly communicate with an airline DCS to check-in and board passengers. They can also take payments for upgrading seats at the gate; enable off-airport check-in, and manage oversize bags at the gate. Trials across five airports indicate that an airline could board as many as 147 passengers in just 12 minutes using a mobile workforce solution.[31]

Another mobile workforce solution envisages that each ground equipment asset would have a wireless unit able to communicate with the operations control room. Ground staff would be able to quickly locate the assets on a map, and remotely deactivate or activate them. Lack of visibility and status often mean that aircraft diesel heaters are left on too long. This example of remote operation of ground support equipment can result in fuel savings of up to 20%.

Singapore's Changi airport is using mobile technology to nurture collaboration among service providers. Last year the airport introduced SWIFT – Service Workforce Instant Feedback Transformation – which allows for the collection of real-time data from customers using washrooms and other facilities within Terminal 3. Smartphones are used by staff to monitor maintenance activities and initiate corrective action by service contractors. The airport has developed an Instant Feedback System of interactive touch screen devices to monitor passenger satisfaction levels at key airport contact points, including check-in, immigration and retail outlets.[32]

The mobile workforce needs resource management solutions designed to optimize all airport and ground-handling operations and to bridge the gap between planning and operations. These are solutions which deliver rostering, staff management, resource allocation, real-time situational awareness and much more besides. Combining state-of-the-art mobility with resource management solutions allows airport users to work across multiple applications from the same devices including Departure Control Systems and Baggage Reconciliation Systems.[33]

CDM and aircraft turnaround

The example of the UK Government's decision to drop plans for additional runways at London Stansted and Heathrow puts in stark relief the need to maximize airport capacity and trim aircraft turnaround times. Mobile solutions have a role to play but CDM is critical when it comes to optimizing the limited resources at an airport. The Civil Air Navigation Services Organization (CANSO) says that CDM needs to be implemented globally and not just in Europe, but Europe's shortage of runways makes it more urgent there. Industry collaboration is vital, says CANSO and Air Navigation Service Providers, airlines and airports must understand the benefits and act accordingly.[34]

Munich Airport became the first airport in Europe to integrate CDM into regular operations following a year long trial which concluded in June 2007. Brussels has also followed suit. Some of the general benefits include improved punctuality, higher planning accuracy, transparency, reduced engine run times, optimized re-start after interruptions, automated and timely data exchange and optimized use of available capacities and assets in all conditions. For example, improved prediction of target time take-off at Munich Airport led to savings of 930 hours in 2009. Over the period 2005 to 2009, waiting time for aircraft at the runway was cut by 29.5%.[35]

At the initiative of EUROCONTROL, the European Air Safety agency, more than 20 airports in Europe have now set up a full standard for CDM which allows ground handlers, airports, airlines and air traffic controllers to share key flight information on a central data base to make operational gains on the runway and apron.

Making the Intelligent Airport a reality

Where the supply chain meets the value chain

Legacy systems can lead to legacy thinking. The Intelligent Airport is not just a supply chain focussed around the safe and timely arrival and departure of aircraft and baggage, it is also a value chain where the passenger should be treated by all stakeholders with the respect due to a paying customer and offered a consumer experience in keeping with the special status of the closed airport environment. This needs to be supported by an end-to-end, door-to-door experience which inspires confidence and encourages convenience shopping and take-up of other consumer services.

A recent management consultancy study estimated sales potential of € 46 billion over the next ten years if airports and airlines collaborate more systematically on expanding their range of offerings. The study highlights the potential for European airports to almost double their incomes from the present € 8-16 per passenger. [36]

That's just one more reason why airports and other air transport industry stakeholders need to look toward collaboration not only to save time and fuel on aircraft turnaround but also to either eliminate entirely, or reduce to the bare minimum of time and effort, non-commercial processes such as check-in and security. Technology is moving much of this activity off-site but, as we have discussed, more needs to be done to address the remaining pain points.

The realization of the Intelligent Airport vision is well underway. Many of the key elements are available now in an affordable way to a broad swathe of airports which are already comfortable with the latest check-in technology and are on a path towards next generation airport management solutions which allow for full integration of Departure Control Systems with Passenger Processing systems.

Infrastructure deployment

Network capabilities will continue to expand through virtualization and cloud computing. The benefits of geolocation will become apparent as more airports use indoor tracking sensors to manage or predict flows of passengers, staff and bags. These systems are currently capturing data with point solutions, but the longer term goal is to make sensors an integrated source of data to feed the situational awareness needs of all airport stakeholders.

The operational efficiency layer

Passenger self-service and mobile workforce solutions are already available and being delivered. With over four million employees at airports, there are opportunities to adapt these solutions for other airport stakeholders such as caterers, security agencies, Air Traffic Control and retail staff. A critical next step for the realization of the Intelligent Airport vision is to leverage systems integration to extract data from multiple systems, including those that support the sensor technologies deployed landside and airside, over an integrated platform and compile it into a data warehouse. The airport integrated platform will provide a scalable interface service between the passenger intelligence/CDM domains and operations services such as flight information displays, check-in and baggage reconciliation systems.

Business Intelligence

The integration of data from multiple sources and the ability to define business logic within the CDM domain provides a business intelligence layer which will ensure that key information and alerts are distributed to management and staff on mobile devices and that all stakeholders, onsite and offsite, involved in the facilitation process have access to the same information. The business intelligence layer will provide analytics to track passenger movements and provide dwell time analysis to predict peak demand and minimize delays. Many tools and reports can be provided to other stakeholders such as retailers, ground transport and rental car operators, and maintenance service providers.

Conclusion

There is a clear industry-wide consensus on the need to overcome the obstacles which remain in the way of achieving the vision of a seamless, end-to-end experience for the passenger. It is evident in the achievement of milestones such as the introduction of e-ticketing and 2D Bar-Coded Boarded Passes. Cross-industry collaboration on forging new universal technology standards reached new heights with the development of the CUPPS standard. All of this augurs well for making the best use of the array of innovative new technologies which are starting to have an impact on airport operations.

An Intelligent Airport is one that is driven by improved productivity and a desire to be agile, effective and efficient, all at the same time. The confluence of technology trends around passenger self-service, collaborative decision-making and business intelligence is what will enable the industry to cope with the foreseeable demand and to work within the limitations of infrastructure and space.

Coming back to the numbers. These are exciting times to be an airport operator. ACI estimates that by 2020 there will be seven billion passengers arriving and departing through the world's airports. The countdown has started for putting the Intelligent Airport in place.

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