international airport review

AIRPORT IT SUPPLEMENT

www.internationalairportreview.com Issue 6 2011

The influence that information technology has on airport operations cannot be underestimated. Almost every aspect of a passenger's transit is controlled by the intricacies of efficient IT.

Within this special IT supplement we have contributions from: **Wayne Smith**, Head of Information Services at Birmingham Airport and **Christian Poulsen**, Vice President, Assets and Technology at Copenhagen Airport. We also have a piece from **Christopher Stein** at the Siemens Infrastructure and Cities Sector explaining the workings of their airport operation and control centre.

Contributors:

Christian Poulsen
CIO and Technical Director of Copenhagen Airports A/S

Christopher Stein
Infrastructure and Cities Sector, Mobility and Logistics Division of Infrastructure Logistics at Siemens AG

Wayne Smith
Head of Information Services at Birmingham Airport

Birmingham's evolution

Birmingham Airport handles nearly nine million passengers per year. It is also a complex community of over 100 different companies. To ensure that each user receives the best possible experience, airport staff have access to a large amount of technology. The person in charge of this technology at Birmingham Airport is Wayne Smith, Head of Information Services, who has been in this position since June 2009.

Wayne's first task was to undertake a transformation programme within the old IT Department. In the past, IT was seen as a necessary evil that had a policing role within the company. The transformation programme changed the focus of the department to delivering services to the organisation. This was a subtle change which, along with the name change, has made the department more customer-focused and is in the process of implementing some of the concepts from ITIL V3.

One of the key things required in an airport environment is responsiveness. "Historically we found that we could not always react quickly to users demands when new servers were required," Wayne said. "We needed a better technology to enable us to respond, without incurring large costs each time a department wanted to test a system." The company therefore decided to invest in virtualisation.

The rebranded Information Services (IS) department was born and now delivers its services to both staff of Birmingham Airport Ltd, and many of the other 100 plus organisations that operate on the Airport site.

IT has changed greatly since Wayne started in airport IT back in 1988. "We used to provide two systems running on an ICL mainframe, a financial system and an Aeronautical Charging/Management Information system," explained Wayne. The 'computer unit', was then a sub-section of the finance department as it was seen very much as supporting just that area of the organisation.

Since then, the arrival of the first PCs pushed processing power out to the users themselves, and then the advent of the network began to centralise it once more. At this point Wayne was PC Manager. "It gave me the opportunity to meet with all PC users of the airport and understand the vast array of applications or systems that they had developed for themselves, either in spreadsheets, small databases, or documents. It gave the best foundation a manager could wish for."

As more and more of these applications became business critical, they became more centralised and the organisation required them to be treated as corporate systems running on one of the two data centres at Birmingham Airport. This gave them a layer

The advent of PCs in 1988 meant that processing power was pushed to the user themselves

of protection in terms of security and resilience. They were handed back to the centralised IT function, ensuring that they were controlled and monitored to give optimum performance.

When taking over responsibility for the department in 2009, Wayne was aware of the issues it faced in transforming to a service delivery model. "We needed to be able to respond quickly," said Wayne. "The old model of offering users a system whereby things took weeks, was no longer valid. We needed to be agile and responsive."

The systems in use now cover all aspects of airport operation. They range from airport operational systems, such as Flight Information Display Systems (FIDS), resource management, aeronautical billing, bussing, etc, to back-office business applications such as finance and procurement, HR and payroll and employee self service via the intranet.

However, server virtualisation is not the end of the story. Wayne would like to extend the concept to the desktop. "Whilst it is not a clear cut business case for virtual desktops, it is something that we are currently investigating by running a small pilot." Wayne explains that giving access to the user to get their desktop and server requirements from anywhere is the ultimate aim.

In addition, Birmingham Airport has also started using off-site resources for some of their services. They have outsourced the hosting of their website to Rackspace which fits nicely with the IS Strategy. "Staff do not know or care in which datacentre their applications are hosted," Wayne states. "It is only a small step to then move their application to an off-site server. Of course staff expect data security to be taken care of by the IS Department, which is part of the service that IS will offer."

> **"The IS Department is no longer a support function, but a strategic partner for all Birmingham Airport departments to ensure that the Airport utilises technology efficiently and effectively"**

Wayne sees the airport making more use of off-site hosting and other projects that are already underway include the migration of the airport's telephony systems to IP based telephony, a replacement system for the Check-In application, the airport's Management System, and replacement for the Baggage Reconciliation System.

Wayne accepts that he is fortunate to have a Management Board that shares his view that investment in the right type of technology will result in increased competitiveness through increased efficiency of both staff and processes. The IS Department is no longer a support function, but a strategic partner for all Birmingham Airport departments to ensure that the Airport utilises technology efficiently and effectively.

BIOGRAPHY

Wayne Smith has been Head of Information Services at Birmingham Airport since June 2009. He has worked in the aviation IT industry since 1988 and has extensive experience of implementing both line-of-business applications and more specialist airport operational systems. He has undertaken a large transformation programme at Birmingham Airport to focus the IT Department on service delivery rather than the implementation of technology which involved a rebranding of the department from IT to IS. He has a Masters Degree in Airport Management and is a Chartered IT Professional Member of the British Computer Society.

SIEMENS

E10001-I9-Z4-V3-7600

www.siemens.com/airports

Letting efficiency take off is the shortest way to a green airport

Our integrated solution portfolio helps airports to keep pace with future demands.

Today's airports face tremendous challenges: growing numbers of passengers, limited energy resources, and ever-stricter environmental regulations. To meet these demands, all aspects of airport efficiency must be optimized, from touchdown to take-off, from buildings to baggage and cargo handling, and from process management to governance.

With the world's most extensive portfolio of airport solutions, Siemens has everything you need to boost efficiency – and make your airport more competitive. For more information: **www.siemens.com/airports**

Answers.

Christian Poulsen
CIO and Technical Director of
Copenhagen Airports A/S

IT takes off in Copenhagen

Whilst ever stricter security rules make air travel more difficult and expensive, Copenhagen Airport is working with a number of IT systems that make travelling easier. In addition, the 100 IT applications at Copenhagen Airport also provide new and highly valuable information about our passengers.

Imagine a break-down of the IT system that controlled the Passenger Information Display Systems (PIDS). Travellers would rush to the counters and assail staff with requests for information, staff that would no longer have access to information on flight departures, gate numbers and baggage. There would be chaos within the terminal. Therefore, the IT systems behind the screens must continue to function, as well as the rest of Copenhagen Airport's IT applications. In all, the airport runs more than 100 IT systems.

With more than 22 million passengers per year and 260,000 flight operations, Copenhagen Airport is the busiest airport in the Nordic region. Passenger numbers are expected to continue to rise, which will be a challenge for all of our IT systems. We spend around DKK 82 million per year on operating these systems and more than DKK 150 million per year on buying and developing new initiatives. Our goal is to optimise the airport's processes via innovation and technology. Copenhagen Airport therefore has hundreds of projects in progress at any given time.

Mobile phone apps

The latest breakthrough has been the applications we have developed for iPhone as well as Android and Nokia smartphones. We are the first airport in the world to incorporate augmented reality into our applications. This means that, in addition to all the information a passenger needs, a mobile phone can also be used as a 'live wayfinder' throughout the terminals.

It should be easy for people to find their way at the airport. Passengers consider this important, as expressed in the feedback we garner regularly within the terminal buildings.

> "Before passengers have even set foot on the ground at Copenhagen Airport, the IT systems at the airport will have played a key role"

With the Copenhagen Airport application, passengers can now 'scan' the terminals with their mobile camera, find shops and restaurants as well as information on distances and in which direction they should be headed to reach their gate.

It is our experience that the better passengers can plan their time at the airport, the less stress they feel, and the more comfortable their journey will be. As a service provider, we are pleased to offer this handy tool. And with the new augmented reality technology in the application, we have made it more hassle-free and a pleasant experience for passengers to be at the airport.

This project required a good deal of development. Most people are aware of GPS positioning as a concept. But as GPS signals cannot penetrate the concrete in the terminal buildings, the signal did not work indoors. In collaboration with German-based software house Metaio, Danish-based Novasa and SITA lab, we developed a system which used the airport's finely meshed Wi-Fi infrastructure for positioning with the same precision as can be achieved via GPS.

With Wi-Fi and passengers' mobile phones, we get important information on the position of passengers in the terminals as well as on their movements. It is very valuable to us that we can anonymously track passenger flows and in that way react to queues and also optimise passenger flows from check-in to gate and from gate to baggage reclaim.

The first slot

Before passengers have even set foot on the ground at Copenhagen Airport, the IT systems at the airport will have played a key role. Prior to passengers booking their tickets, the airlines have bought available 'slots' at the airport. In order to avoid the airport favouring certain customers over others, slot allocation takes place using an IT system which the airport has no influence over. When sharing passenger information between the airlines and airport it is essential for other systems to work in synchronisation. This is partly achieved through the airport's central traffic-system database which contains all relevant flight and passenger information.

Increasing use of CUSS

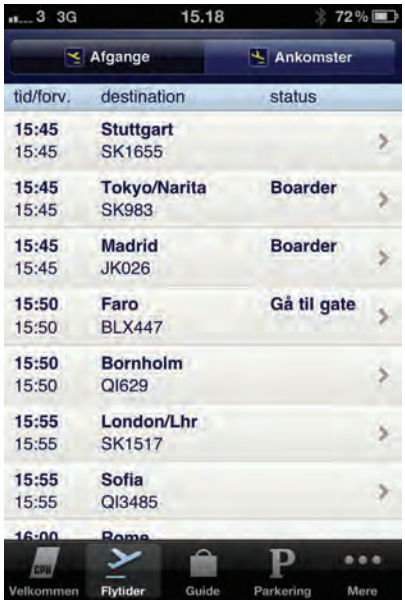
When passengers check in at the airport, they typically do so via the airport's IT systems.

Copenhagen is the market leader in CUSS kiosks (Common User Self Service). We have installed CUSS kiosks throughout the airport and spent a lot of resources on teaching passengers how to use them. Two out of three passengers now use CUSS and, according to our passenger surveys, they are very satisfied with doing so.

The CUSS kiosks are important to us as they help us reduce queues and make passengers more independent so that they can move

> **"When passengers check in at the airport, they typically do so via the airport's IT systems"**

through the airport faster and more efficiently. The next step will be to develop even better automatic baggage drop facilities that will make the process even easier and more efficient. When it comes to traditional check-in of baggage and passengers, we use a CUTE platform (Common Use Terminal Equipment).



The airport has developed an application for the iphone as well as Android and Nokia smartphones

Copenhagen Airport is the busiest airport in the Nordic region

Baggage handling

Baggage handling is a world of its own. As many as 19 IT systems are involved in ensuring that baggage gets on the same flight as the passenger. The systems control the rollers under the baggage belts that convey baggage in the right direction to the right scanners; they also select bags for extra screening and, in the end, make the bags end up on the right baggage cart for the right aircraft. In a not too distant future, we hope to be able to use RFID (Radio Frequency Identification) so passengers can follow their luggage. We already use the system to keep track of where the airport's equipment is located, ranging from vehicles to Boeing 737 tow bars.

Via the SITA global network, Copenhagen Airport is connected to central databases that register movements of aircraft, baggage and passengers worldwide. This information is used, among other things, to print baggage tags, which are used to ensure that the bags can move through the airport's nine kilometres of baggage belts to the right flight and from there, further out into the world.

If these databases should break down, many of the airports within the world would end up in chaos. For this reason, redundant connections have been established, for instance to an identical backup database in the Netherlands.

Security and capacity

Of course, it is not only baggage that must be screened; passengers must also be thoroughly checked. The great challenge with security is capacity. The number of security rules, requirements and procedures is growing. This means that airports worldwide are using ever more resources and passengers are spending more time in security screening. This is expensive. Copenhagen Airport's security costs almost quadrupled between 2001 and 2010.

> **“ As many as 19 IT systems are involved in ensuring that baggage gets on the same flight as the passenger ”**

During the same period, the number of people working in security almost tripled.

With the prospects of continuing growth in passenger numbers, it is therefore important to take an innovative approach to security and integrate IT and new technology even more within the process. On the way to security screening, passengers have their identity checked using Passenger Validation (PV). This is done in a quick process as it only involves scanning the ticket or the barcode on the passenger's mobile phone.

Within security screening, carry-on bags and passengers are checked in scanners. The next step in this field may be liquid scanners which would allow bottles and PCs to remain in the carry-on baggage. However, they are not fast and efficient enough yet.

Copenhagen is the first airport in the world to incorporate augmented reality into their applications

Shopping and boarding

When passengers are through the security screening and have reached the shopping areas of the terminals, a large number of IT systems are at work there also. The equipment used is mostly of a standard nature ranging from anti-theft protection of expensive products to efficient ventilation, the airport sound system and advertising screens. At the gates, airline staff conduct Passenger Validation (PV). This is also done by scanning the barcode of boarding cards.

However, that may soon be obsolete. With NFC (Near Field Communication), passengers can soon have both their boarding card and ID on their mobile phone or on a chip, for instance in their passport.

40,000 kilometres of cable

It is difficult not to be impressed when you consider the scope of the network and the IT systems used to operate a state-of-the-art airport.

- 40,000 kilometres of data and telephony cabling
- 40,000 PDS outlets for PCs and other equipment
- 200 kilometres of fibre optical cables
- 12,000 active network ports
- 445 wiring closets
- 640 Wi-Fi access points.

Our local area network is divided into a critical network for the infrastructure and a commercial network which the airport's shops and companies use for internet access. We have two server rooms for the many systems and a third server room used solely for back-up. The systems must work 24/7.

We have 88 employees in our IT Department who work on system development and operation as well as on new projects. In addition, more than 20 specialists are permanently attached to Copenhagen Airport providing third party assistance, as are a number of third party suppliers. We have plenty of work to do, and the workload will not fall in the years to come.

So, even the sandwich served on board your flight depends on a well-functioning IT system that supports the players around a flight operation, so that everybody stays informed about flight status, departure time etc. The system is used by everyone, ranging from cleaning staff to catering services in order to provide the right services and deliveries to the right flights.

BIOGRAPHY

Christian Poulsen holds a BSc in Engineering (Electronics/IT line) from the Academy of Engineering at the Technical University of Denmark (1988). Moreover, he holds a BCom in International Trade from the Copenhagen Business School (1992) and an Executive MBA from the Copenhagen Business School (2005). From 1988-1992, Christian worked in the field of industrial software and electronics with Microconsult, most recently as Departmental Manager. From 1992-1997, he worked for Carl Bro as Divisional Manager of Carl Bro Informatics A/S; from 1997-1999 he was Group IT Director of Carl Bro Gruppen A/S; and from 1999-2001, he was CEO of Carl Bro IT & Telekommunikation A/S. During the period 2001-2005, Christian was CEO of Netman A/S, a software company owned by Hewlett-Packard which developed and exported network management systems and products to international telecoms operators. From 2005 to 2008, he was CEO of HandStep A/S, a mobility specialist and IT company striving for an IPO on the Copenhagen Stock Exchange.

Christian joined Copenhagen Airports A/S on 1 November 2008 as Vice President initially with overall responsibility for IT. From April 2011 he has been responsible for Assets & Technology i.e all of Copenhagen Airports technical installations, IT systems, Runway/Apron facilities and buildings (Technical Director).

Join international airport review on LinkedIn®

Exchange information, ideas & opportunities

Let's connect!

Network online with your industry peers, visit:

http://linkd.in/IntAirport

Members & non-members are welcome to join the discussions

Christopher Stein
Infrastructure and Cities Sector, Mobility and Logistics Division of Infrastructure Logistics at Siemens AG

Airport co-ordination and optimisation simplified with the Airport Operation Control Center (APOC)

A variety of different processes and complex IT systems at an airport will always impact on daily operations. Therefore, smooth co-operation amongst all stakeholders is vital for operational excellence in a competitive environment.

Today, a number of stakeholders at an airport run their own separate operation centers: apron control, tower and airline operations act independently from one other. But wouldn't a joint facility combining all major stakeholders at an airport such as operators, airlines, ground handling and air-traffic management improve and optimise overall operation? The answer is yes, and the Airport Operations Centre (APOC) is the perfect solution. APOC acts as the main facilitator for all stakeholders to achieve operational excellence.

The main task of the APOC is not only to monitor the airport's operations but to provide leadership to the other existing centers as previously mentioned, and to serve as the point of contact for the network management. Any airport operator will confirm that airlines only accept guidance from neutral third-party units. A representative from a competing airline, for example, would have no influence. The APOC leadership must therefore be based on goals that are defined collaboratively, and these must be recorded in the Airport Operation Plan (AOP). The APOC serves as a central platform that supports collaboration between the different airside and landside stakeholders for joint situation assessment and diagnosis. In addition, APOC assists with plan generation and implementation as well as co-ordination and communication.

> **"The APOC does not replace existing organisational structures at an airport. Instead, representatives from each stakeholder come together as agents and negotiate key issues that require action"**

Real Collaborative Decision Making

The APOC does not replace existing organisational structures at an airport. Instead, representatives from each stakeholder come together as agents and negotiate key issues that require action. These agents make joint decisions, taking into account constraints and interests from their respective organisations. In turn, the representatives also communicate the decisions to their organisations. Very often, the APOC represents for the first time, Collaborative Decision Making (CDM) within their structure.

The focus is always on end-to-end processes. By monitoring and supporting the core airport processes, the APOC helps achieve the overall major goal. It establishes systems and processes to enable a common focus by all airport stakeholders in regard to punctuality, process quality and continuous improvement. Furthermore, it drives the CDM processes related to specific issues amongst all the parties.

Flexible setup

The APOC can be set up either in a central physical location or in a decentralised setting. In the case of a physical building or room, the APOC consists of workstations for each different APOC agent. A concerted video wall display portrays the overall situation, including predictions and plans, to support the stakeholders' common situational awareness. One big advantage of the physical APOC is the possibility of direct, human-to-human communication, which is especially useful in handling exceptional cases. The integration of meeting and discussion spaces in the APOC supports this collaboration. Furthermore, the

Siemens' APOC co-ordinates baggage operations at Munich Airport

facility should be ergonomically designed and well suited for the use of IT systems.

In a decentralised setting, all relevant stakeholders and decision makers are interconnected by shared information, communication infrastructure and concerted collaboration processes. A stakeholder's individual role determines which concrete IT systems are integrated, for example, an airline agent would very likely be given access to the transfer passenger display. Further IT systems, such as an operations planning system, support 'what if?' simulation capabilities. Up-to-date constraints and decisions are taken into account to assist with negotiation processes amongst the different agents.

Whether a centralised or decentralised setup is chosen, the APOC has a strategic responsibility for the ongoing improvement of the core airport processes. The APOC also provides a bridge between the functional

"In a decentralised setting, all relevant stakeholders and decision makers are interconnected by shared information, communication infrastructure and concerted collaboration processes"

stakeholder areas and airport governance forums. The performance of the APOC and its processes relies on the interaction between key staff in the APOC and their points of contact in the functional areas. The main interactions concern planning, problem solving and record keeping related to actions for addressing events.

Siemens as a major player in the airport community and system integration expert provides consultancy and design services on how to set up an Airport Operation Control Center. From first planning through to commissioning and handover to operation, Siemens supports its customer with the integration of existing systems or deployment of new systems as required. Siemens' vast expertise proven in many different operation center projects such as the Terminal four operation center in Madrid Barajas, operation centers in Bangkok, Hyderabad or Bangalore as well as the baggage operation centers in Munich, Milan Malpensa and Beijing Capitol Airport. All of these airports provide a basis for all kinds of operation center models.

BIOGRAPHY

Christopher Stein has over 10 years of airport IT experience, which includes three years spent in project management including contract and programme management. He has been heavily involved with the IT systems at Suvarnbhumi Airport in Bangkok, Thailand. He has worked for six years as a Sales Manager and currently works within the Infrastructure and Cities Sector, Mobility and Logistics Division of Infrastructure Logistics at Siemens AG

christopher.stein@siemens.com