AIRPORT TECHNOLOGY & COMPETITIVENESS

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SITA's airport footprint

**CUTE:**
- 320+ airports worldwide
- 300+ customers
- 40000 workstations
- Handling more than 550 million pax a year

**CUSS (Kiosks):**
- 70+ airports worldwide
- 2800+ (dedicated + common use) deployed

**Baggage Sys:**
- Deployed in 130+ airports (35 Tier 1)
- RFID tags implementation in Hong Kong
- WorldTracer by 450 airlines and ground handlers

**Airport Ops Sys**
- Airport Management Sys:
  - 70+ airports
- Resource Mgmt Sys:
  - 70+ airports
- Flight Info Display Sys:
  - 120+ airports

**Consulting**
- Airport IT Master Plan: 5 airports
- IT Commercialisation: 15 airports

**Outsourcing**
- 2 airports

**Customers**:  
- Amsterdam
- Gatwick
- Madrid
- Barcelona
- Zurich
- Chicago
- Los Angeles
- Orlando
- Toronto
- Beijing
- Osaka
- Hong Kong
- Sao Paulo
- Johannesburg
- Amman
- Istanbul

* Non-exhaustive list

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Agenda

Airport trends
Airport challenges
The role of IT and the different airport management systems
  • Passenger
  • Baggage
  • Aircraft
  • Security
  • Airport Operations
Bringing it all together: the intelligent airport
Conclusions
Airport trends
The new airport?

Source: Fentress Architects: Airport City

Source: Innopedia Airport of Future Systems
A view from the industry

**End-to-end self-service and automation**: all check-in and ticketing is carried out online. Smart-bag tags. No manual handling from bag drop to plane. Secure intermodal link train to airport in one step.
- Grimshaw Architects

Focus on **passenger experience**, safety, security, efficiency and by developing an integrated and adaptive complex systems approach for the design, management and operation of airports.
- Queensland University of Technology’s Airport of Future Programme

**Optimised** check-in, baggage drop and security **processes** for Frequent Flyers. “*Next-generation check-in is all about responding to our customers’ desire for increased speed and ease through the airport process*”.
- Qantas Airport of the Future Project
A view from the industry (cont’d)

Optimal exploitation of space. Low environmental impact. Sustainable use of resources. Maximum flexibility.
• Danish Airport Group’s ‘The Airport of the Future’ project

A passenger-sensing, self-organising unified network to track the location of every passenger and bag in the terminal will feature in future airports: a single infrastructure that can handle GSM, 3G, Wi-Fi and RFID communications.
• University of Cambridge, University College London, and the University of Leeds (Airport of the Future Project)

Green Airports: management of environment impact of airports that is concerned with climate change, aircraft noise disturbance, local air quality, resource (energy and water) use, ecological and habitat disruption and wastes management.
• Ultra Green Airport Seminar
Major changes in 2020
The relevance to airports

Trends
• It’s all about me!
• I can travel the world (virtually)
• Shifting “East”
• Changing commercial and business models
• Easing the security pain
• Becoming greener
Disruptive trends shaping the airport business

- Passengers demanding enhanced travel experience: faster, more efficient and seamless service, both at the airport and beyond it
- Social networks

- Self-service technologies transforming check-in and boarding
- Mobility solutions are driving process efficiency and profitability
- Security technologies altering passenger & baggage processing
- Virtualization and infrastructure as a service is cutting cost and increasing agility

- Airports are increasingly commercialized and service oriented
- Processes Integration and Collaboration
- Airport is becoming an increasing factor in the decision making process
- Environmental pressure: green airports
Top technology trends & investment priorities

Improving customer service is No. 1 investment driver
Top investment programmes: Passenger Processing, Mobile Services and Refresh IT Infrastructure
More self-service (kiosks)
Social networks are a future building block for improved customer service
Business Intelligence and collaborative tools will improve airport performance
Virtualization & Cloud Computing

Source: SITA Airport IT Trends Survey 2011
Driving the adoption of different business models

Business Enterprise: commercially-driven and strategic / Concession (advertising, parking, retail, pos)

Service Provider: Space, Utilities, Technology

Hub Operator: Integrated & Collaborative: facilitate passenger, baggage, and aircraft turnaround
Transforming airports into highly competitive and efficient businesses

Possessing a strong platform to build a Sustainable Airport Ecosystem to enhance the airport’s competitive advantage:

- Extend the airport’s digital boundaries and service reach
- Move from a Reactive ->Planning ->To a Predictive model through use of Collaboration Tools
- Integrated ITC infrastructure and solutions
- Generate new revenue streams
- Continually improve business process and service excellence to maintain market position

Strong and recognised Airport brand
Valued for Performance, Safety, Comfort and User Experience
Airport challenges
The airport challenges

Stakeholder management

Operational characteristics

Capacity, productivity & service levels

Airport size

Financial performance
Increased complexity in stakeholder management

To be successful over time, even for and on behalf of shareholders, businesses must address multiple stakeholders. If companies do not give each of their stakeholders the right level of focus, both their corporate reputation and their market capitalisation are likely to suffer in one way or another. (Neely, A., 2002)
Airlines and airports

Orthogonal Organisations
• Interdependent but meeting at fixed touch points
• Generally poor communication and often antagonism between them

Airlines
• Operating to multiple locations in a coherent network
• Consistent service and technology standards across locations
• Major emphasis on marketing and pricing as well as aircraft operation and maintenance
• Direct knowledge of passengers
• Receive and retain the major part of passenger and cargo revenue

Airports
• Typically single locations
• Supporting multiple competitive airlines with evolving and different standards
• Limited roles for marketing and pricing
• No detail information on passengers, even names or contacts
• Essentially fixed unit aeronautical revenue per passenger and per flight
Operational characteristics

Hub airports have different needs for management of transfers
- Greater potential for RFID baggage sortation
- Peaky traffic requires better flow management and faster responses to variations, hence a higher level of information capture and presentation

Airports with predominantly business travel can justify high quality passenger service
- Time from the car park to departure
- Service convenience and CUPPS
- Significant retail opportunities (hence greater terminal space for retail activity)

Predominantly charter traffic does not warrant the same expenditure on passengers
- LCC terminals
- Lower retail spend per passenger
- Less sophisticated travellers hence lesser value from CUSS

IT strategy needs to match the mix and the ambitions
Capacity, productivity and service levels

Airports are likely to be constrained by limited resources in one or more areas, for example:

- Runway capacity at peak periods
  - Options to increase capacity by restricting smaller aircraft, encouraging off-peak use, better ATC, building a new runway
- Stands and gates
  - Options to improve resource allocation, towing aircraft off pier served stands, encouraging off-peak use, improving on-time departure performance
- Terminal capacity
  - Reduce in terminal processes (e.g. check-in), later check-in timing, improving on-time departure performance, reduce retail space, greater common-use of fixed resources
- Baggage transfer times
  - Improve sortation capacity, better stand allocation algorithms, extend wave durations

Increased utilisation of resources increases average queue lengths, reduces service levels and on-time performance, reduces retail spend per passenger.

- Most capacity limitations can be solved only by major capital expenditure, or better planning and operational management
Financial performance

Control and reduction of cost
• Understanding of costs, activities and their pricing
• Capital costs
  • Design and control of projects
  • Optimising throughput of existing facilities
• Expenses
  • Lifetime asset management
  • Staff productivity
  • Energy management
  • Optimal choice of service providers, internal or external

Generation of income
• Aeronautical income
  • Passenger charges and growth of passenger numbers especially off-peak
  • Landing and parking and associated growth of traffic especially off-peak
  • Security
• Non-aeronautical income
  • Property
  • Retail including parking
  • Ancillary services, e.g. communications
Airport size

Small airports may not warrant complex solutions
• Essentially human size challenges in scheduling and responding to variations from plan
• Main investments in FIDS, communications
• Manual baggage handling, maybe CUPPS

Large airports demand comprehensive solutions
• Planning and operational complexity is high, ripple effects from poor decisions can be major
• Resource scheduling is complex
• People coordination and information flows much more difficult
• Multiple systems, perhaps 100 logical systems
• Necessity for comprehensive management of systems, coherent infrastructure and systems integration
Key to survival: strong competitive advantage

- Create **competitive advantage** on 5 fronts: spatial, demand, service, facilities and managerial.

- **Airport efficiency**: to achieve higher airport operational efficiency thereby, contributing to the cost competitiveness of the airport

- Be the **passenger’s airport choice** in a multi-airport region is determined by factors such as: number of airlines, flight frequencies and access time

- Beyond providing a pleasant terminal environment with good customer amenities, an airport must seek to distinguish itself through delivering **“Service Excellence”** (Skytrax)
The role of IT
Airport operation is a complex, dynamic, time-critical, highly intertwined business
The role of IT: to meet airport business needs

The range and the functionality of IT systems and services that impact an airport are continually increasing

- IT is increasingly important to airport success, so that for all but small airports, effective IT is critical to airport success

Evolution of airport best practices requires continual evolution of IT systems and services

- IT is not something that is installed then remains largely unchanged until the physical or financial end-of-life of each component

Managing continual change of IT systems and services requires a framework and plan to deliver systems that:

- Meet the airport’s business needs
- Deliver optimum value to the airport
- Provide high reliability
- Support managed change and evolution
By supporting different operations
IT Infrastructure: intelligent network & seamless communications
Aircraft operations: more IT demanding

New aircraft (A380, B787) are leveraging the latest IT and communications technologies, requiring:

- New network solutions in the air
- Generic wireless IP (Wifi, Wimax)
- IP wide area networks at the gate and on tarmac
Ensuring flexibility & enabling infrastructure

Integrated Platform and Intelligent Network: Technology platform to enable process optimisation
• To provide a communication infrastructure that gives the ability to flexibly and quickly provision reliable, controlled and secured services
Delivers personal and context aware services
• Wired or wireless
• Multi purpose services: data, voice, video, mobile, applications
Enables mobility
• On any device type (Laptop, PDA, Phone, etc.)
Integrated & Collaborative
• From anywhere at the airport
• To any user at the airport (passenger, airline, tenants, aircraft)
Passenger systems
Baggage systems
Passenger systems: Incremental operational efficiency

Common use environment: end-to-end Self Service

- **CUPPS**
  - on average can deliver approximately 50% savings in terms of space. In Brazil the estimated savings is 75%, without CUTE the airport would require an additional 108 positions to existing 140 used by the airlines
  - extend the terminal boundaries by enabling off-airport capabilities

- **CUSS**: 
  - 10 kiosks + 6 dedicated bag drop counters can handle approximately 300 passengers per hour compared 108-120 passengers per hour handled in 6 counters

- **Common Bag Drop**: 
  - Bag drop process can be completed in as little as 20 seconds for a passenger with one self-tagged bag. The bag drop transaction rate can be up to 30% faster than using traditional counter check-in procedures

- **Self-Boarding Gate**: 
  - Shorter passenger queues, ground personnel being freed up for more customer-focused tasks, enhanced passenger experience
Passenger systems:
Incremental operational efficiency (cont’d)

Geo-localisation: better flow management and passenger tracking
• Passenger@Airports
  • In Geneva the solution was combined with controlled access gates that provide first and business class passengers with a differentiated service. Another benefit is that they provide some tracking capability and business intelligence on passenger flow and habits at the airport. The benefits:
    • The airport charges airlines for the utilization of the controlled gates
    • During peak periods it can save up to 15min in queuing time
    • Improved understanding of passenger flows
    • Better use of security staff time
Baggage systems: improving customer experience

Reduced Operational Cost
• Reduction in numbers of mishandled baggage equates to reduction in cost of mishandled baggage. Typically, each mishandled bag which results in the airline needing to restore the bag to the passenger cost the airlines $75-$200

Enhanced Customer Service
• Fewer bags lost = better service + improved customer perception. When baggage is misplaced, BRS helps reduce customer frustration by enabling airlines to provide better information on passenger bag status.

Minimized Aircraft Delays
• Automated solutions helps reduce expensive aircraft delays by helping staff locate bags belonging to missing passengers, minimizing off-load time.

Increased Efficiency & Productivity
• The automation of baggage reconciliation, tracking and tracing provides a powerful solution which helps to deliver optimal efficiency, time and money savings.
Security systems / Border Management Solutions (passenger perspective)

Biometric solutions apply throughout the passenger journey

DOC  VIS  PRE  CHK  SEC  OUT  DEP  ARR

ePassport

Bag Drop Check In Self Service

Biometric Visa

Security Checkpoint Registered Travelers

Self Boarding

Automated Border Control
Security systems / Border Management Solutions: facilitating passenger travel

- Security is key to building passenger confidence in the air transport industry; requirements must accommodate continued growth thus promoting tourism and trade.
- Border Management Solutions need to enable governments to focus their resources on high risk passengers and persons of interest while simplifying passenger travel for the vast majority of low risk passengers.
- A converged, multi-layered approach — including the provision of passenger data (APIS/iAPI, DCS & PNR), automated border control programs, and the use of biometrics and document readers — will be key to achieving the industry’s security goals.
- International standards, harmonization, interoperability, multi-state (international) and inter-agency (national) collaboration.
- Ability to develop agile, seamless, less intrusive operations while dealing with a wider range of threats.
Fully integrated airport systems

AOCC

Integration Layer

Airport Operational Database (AODB)

Airport Resource Manager (RMS)

A-CDM Tool

Retailers

Other Stakeholders

Airport

Airlines

Power Mgmt System / GPU

Security System (Intrusion Detection)

Fire Detection & Alarm System (FADS)

ERP (Billing)

Baggage Handling System (BHS)

Access Control System (ACS)

CCTV

Public Announcement System (PAS)

Information Kiosks

Air Traffic Control

Weather Information

Building Management System (BMS)

Visual Docking Guide System (VGDS)

Flight Information System (FIDS)

CUTE

CUSS

Baggage Reconciliation System (BRS)

Airline Systems / Airline Ops Control

IATA Messages (MVT/LDM)

AFTN
Integrative and collaborative: CDM

- Terminal Landside Operations
- Airside CDM
- Airport CDM, Total Airport Mgt
- Regional CDM
- System-wide CDM ‘Gate to gate’
- System-wide CDM ‘Kerb to kerb’

Source: Metron Aviation
Integrated and Collaborative

Integrated Airport Management Systems (AMS)

- Takes the complexity out of many airport processes, simplifying data management and making airport operations more straightforward
- Business intelligence reporting
- A-CDM to ensure improvement in ATC Flow and Capacity Management by reducing delays, improving punctuality, and optimising resource utilisation:
  - In some cases, an additional 2 to 3 movements during peak hours
  - Airlines can also benefit from reduced fuel costs

Airport Operations Control Centre (AOC)

- The highest level of authority in an operational airport operation. It integrates all four main command centres: Operations, Security, Emergency and Network
- The AOCC has decision-making power on behalf of all functional areas of the airport and it covers all activities within the airport from a simple operation to highly complex and emergency operation
The Intelligent Airport
To be successful airports need to transform by addressing three main areas:

**INFRASTRUCTURE**
- Unified and consolidated infrastructure
- Reliability is key to Communication infrastructure
- Support to all type of communications

**OPERATIONAL EFFICIENCY**
- Systems need to be better integrated
- Standardised Processes and technology
- Focused on operational efficiency and service

**BUSINESS INTELLIGENCE**
- Full visibility and optimised management of the airport
- Real-time information needs to be shared
- Stakeholders need to work together intelligently and coherently

[Diagram showing the three main areas with corresponding points]
Develop intelligent networks to meet growing infrastructure demand

- Support unified common mesh wireless network (3G/4G, wifi, wiMAX)
- Provide virtualization/cloud computing solutions
- Extend shared infrastructure to cover aerotropolis (CUSS, CUPPS, AirportHub, …)
- Develop platform that enables asset tracking
Enable end-to-end automated data flow between systems

Improve the passenger experience while reducing costs

Operational Efficiency

Infrastructure
Business Intelligence to make better, more informed decisions

Provide mobile services for passengers and employees

- Business Intelligence
- Operational Efficiency
- Infrastructure
IT will bring the transformational benefits to airports

Facilitate and support process innovation and transformation:
- Improved responsiveness
- Service and product enhancement as result of re-engineered processes

Value derived from IT’s capacity to collect, store, process and disseminate information:
- Improved decision quality
- Employee empowerment
- Decreased use of resources
- Enhanced organisational effectiveness

Value is derived from an efficiency perspective:
- Productivity improvement
- Labour savings
- Cost reductions
Conclusions

• Disruptive trends are shaping the airport business through the adoption of different models
• More than ever airports are competing with each other
• Stakeholders relationships are becoming more complex and they are pushing airports to provide a platform for their new processes and applications
• IT will play a critical and transformational role in supporting different processes and systems
• Airports are also becoming more integrative & collaborative demanding real-time exchange of information
• Technology will deliver to airports: Automational. Informational and Transformational benefits through:
  • Common integrated infrastructure
  • Operational efficiency
  • Business Intelligence
Thank you
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Stakeholder Management:
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• IATA Fast Travel Program: http://www.iata.org/pressroom/facts_figures/fact_sheets/Pages/fast-ti
• SITA: Airport IT Trends | Airline IT Trends | Self-Service Survey (www.sita.aero)
Back up slides

About SITA
SITA Portfolio Overview

Investments are continuing to transform SITA’s portfolio, through development and innovation.

**Communications & Infrastructure**
- ATI Messaging
- Managed Infrastructure
- Voice & Data Communications
- Mobile

**Professional Services**
- Systems Integration
- Programme & Project Management
- Outsourcing

**Airport**
- Operations
- Baggage
- Passenger handling
- Platform & applications

**Passenger**
- Fares
- Reservations, Revenue planning & management
- Ticketing & DCS
- Business intelligence
- Ancillary services

**Aircraft**
- Aircom Network & Applications
- ATC Systems & Services
- Flight briefing, Operations, crew

**Border Security**
- Passenger data acquisition
- Database
- Risk assessment
- Visualization

**Air Cargo**
- Core Cargo Services
- Enterprise Services
- Community Services

ATI = Air Transport Industry
Customers the world over: a snapshot