Total Airport Management: New Generation of Airport Operational Control Centers

Thomas Romig, Geneva Airport
The Airport Business is Evolving

Drivers for Change

Maximization of Capacity
- Landside and terminal
- Airside and airspace

Customer expectations
- Real time monitoring of levels of service
- Social media

Business performance
- Intelligent airports
- Airport privatization
- Airports ran as businesses with established performance objectives

Cost efficiencies
- Objectives to reduce costs in most domains
- Seeking to improve efficiency and productivity

Availability of data
- Increase in the number of processes measured and recorded
- Powerful data mining technology available
Total Airport Management

*Focus on the system not the operations*

- Individual Operational Stakeholders and Plans
  - Multi-stakeholder and multi-environment: lack of coordination
- Airport System Management
  - Airport wide approach to management of system performance
Airports are run as Businesses

The Intelligent Airport

The Intelligent Airport is focused on:

- Customer experience
- Airport system business performance

The building blocks of the Intelligent Airport are:

- Predictive models
- Real-time business intelligence (BI)
- Effective analytics

Source: AEMC Guideline 2017
Airport Enterprise Management

A business model transformation

Source: AEMC Guideline 2017
Guidelines form the future Airport Enterprise Management Center (AEMC) have been developed by an Aviation Strategies International (ASI) led group of airports.

The elements of the guidelines are:

- User Requirements
- KPI & the Dashboard
- Organization & Governance
- Technology
- AEMC Layout
Airport Enterprise Management Center

Objectives

- Business continuity management
- Common situational awareness
- Data driven scenario planning
- Airport system collaborative decision making
- Customer service orientation
- IT system integration

System wide performance management
(operations, environment, financial)
Airport Enterprise Management Center

Operating Principles

- Airport system performance focal point
- Integrate all key performance related functions
- Be empowered and have the authority to make decisions related to the system’s operations
- Include business continuity planning and management processes
- Be supported by analysts and business intelligence
## Airport Enterprise Management Center

### Scalable participation

<table>
<thead>
<tr>
<th>LESS THAN 5 MILLION E/D</th>
<th>5 TO 10 MILLION E/D</th>
<th>MORE THAN 10 MILLION E/D</th>
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<tbody>
<tr>
<td>Airport operations</td>
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<td>Ground handlers</td>
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<td>De-icing control</td>
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<td>Work order Control (Eng./Maint)</td>
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<td>Duty Manager</td>
<td>Terminal Duty Manager</td>
<td>Terminal Duty Manager</td>
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- Passenger experience manager
- Major carriers
- Air navigation services
- Technical services (IT)
- Resource allocation
- Border control (govt. agencies)
- Analysis & new applications

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- Finance & Admin
- Meteorology
- Key concessionaires

*Source: AEMC Guideline 2017*
Airport Enterprise Management Center

Integration of the airport ecosystem

- Multi stakeholder sharing of data and information.
- Focus on multiple processes.
- Leverage “open-source” and “open-data” concepts for increased transparency.

Source: AEMC Guideline 2017
Airport Enterprise Management Center

System Integration

- Using diverse airport systems to integrate information and improve common situational awareness.
- System wide and transparent approach to information sharing.

Source: AEMC Guideline 2017
Airport Enterprise Management Center

Data integration

- Fully integrated internal and external data sources.
- Use of BI and data mining technology to run «what-if» scenarios.

Source: AEMC Guideline 2017
# Airport Enterprise Management Center

## KPIs and Airport Dashboarding

- **Safety & Security**
- **Operations Performance**
- **Business performance**
- **Environmental performance**
- **Customer experience**
- **Community relations**

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### Airports Operations Performance Indicators

<table>
<thead>
<tr>
<th>REAL TIME INDICATORS</th>
<th>PERIODIC INDICATORS</th>
<th>PREDICTIVE &amp; STRATEGIC INDICATORS</th>
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<tr>
<td><strong>SAFETY &amp; SECURITY</strong></td>
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<td>FOD Events/Alerts</td>
<td>Public Injuries</td>
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<tr>
<td>Critical Infrastructure Incidents</td>
<td>Occupational Injuries</td>
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<tr>
<td>Spill Events/Alerts</td>
<td>Lost work time from Accidents</td>
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<tr>
<td>Adverse Operations</td>
<td>Employee Accidents</td>
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<td>OIA Breakdown</td>
<td>Non-Motoraccidents</td>
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<td>Airside Incidents</td>
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**Source:** AEMC Guideline 2017
Airport Enterprise Management Center

Expected capabilities

- Combining data sources:
  - building temperature, with social media commentary on passenger reactions to answer questions like “is Concourse D consistently too hot for passengers?”
  - financial, operational and maintenance data: the down time on passenger boarding bridge 24 for maintenance is costing $8000/month in lost revenue
  - queue monitoring and passenger spending to identify the optimal queue time at border or security checks.

- Enabling simulations:
  - “if new aircraft type XY” arrives at a certain time, how will this affect capacity?
  - Running a nominal schedule from the Airport Master Plan through daily operations IT systems to assess operational impacts, gaps in capability and financial impacts

- Leveraging available operational data with internal Wi-Fi and Bluetooth messaging to inform passengers of wait times and alternatives
Airport Enterprise Management Center

Conceptual layout

Source: AEMC Guideline 2017 - PIXYS design
Airport Enterprise Management Center

Conceptual layout

Source: AEMC Guideline 2017 - PIXYS design
AIRPORT ENTERPRISE MANAGEMENT CENTRE (AEMC)
INDUSTRY GUIDELINES WORKING GROUP

Community of Practice