Aspects of
1. Airport Operations Plan / Platform
2. Airport Operations Control Center

Dr. Christoph Meier, SIEMENS
TAMS Final Dissemination Event
Stuttgart, 2012-05-22
AOP, from concept to implementation

**Performance**
(e.g. punctuality)

**Traffic flow**
(e.g. departure-queue)

**Main processes**
(e.g. landing)

**Detail processes**
(e.g. boarding)

**Management Paradigm:**
From Objectives down to Ops. & Procs.

**Short-Term-Contracts & Market Mechanisms**
for Plan Adherence

On-Time-Preferred-Served

New Stakeholder Workshare

Deboarding
PAX Transport
Ankunft
Gepäck Handling
Ankunft
PAX Transport
Abflug
Fueling
Catering
Gepäck Handling
Abflug
Enteisung
Boarding
Beladung
Gepäck Entladung
Cleaning
Anflug
Taxi-In Turn Around Push Back Remote
Taxi-Out
Taxi-Out

Main processes (e.g. landing)

Detail processes (e.g. boarding)

**Performance**
(e.g. punctuality)

**Traffic flow**
(e.g. departure-queue)

**Main processes**
(e.g. landing)

**Detail processes**
(e.g. boarding)
Challenge of AOP & Integration Platform
5 Key Requirements

• Integration platform shall support
  • Data exchange and persistence
  • Information integration
  • Process integration
  • Workflow integration

• Open, modular approach, integrating legacy systems, scalable for 2...160MPax Airports...

• Support today's Business Process...A-CDM... TAMS

• Enterprise IT, Mobile & Cloud Computing, SaaS option

• 1 Airport ... N Airports of one Country or one Investor
Logical Domain Model
Enterprise IT Technologies
Smart Concepts (e.g. SEAT)

- Taxi-In
- Turnaround
- Schedule

- Target
- Estimate
- Actual

- ALDT
- AIBT

- External Delay
- Taxi-in Delay

Best Time

Relevant Time
Supporting today’s business processes

Season Planning  
Ops Day Planning  
Ops Day Execution  
Post Ops Works
Supporting TAMS business processes
## Airport Performance Manager – Processes

<table>
<thead>
<tr>
<th>Flight</th>
<th>Approach</th>
<th>Taxi-in</th>
<th>Turn-Around</th>
<th>Pushback</th>
<th>Taxi-out</th>
<th>Climb-out</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS235</td>
<td>+00:02</td>
<td>09:33</td>
<td>10:18</td>
<td>10:21</td>
<td>10:31</td>
<td>10:36</td>
</tr>
<tr>
<td>ABS234</td>
<td>-00:05</td>
<td>09:39</td>
<td>10:29</td>
<td>10:21</td>
<td>10:31</td>
<td>10:51</td>
</tr>
<tr>
<td>C91651</td>
<td>08:33</td>
<td>08:43</td>
<td>-00:03</td>
<td>09:31</td>
<td>09:41</td>
<td>09:46</td>
</tr>
<tr>
<td>C91654</td>
<td>08:33</td>
<td>08:43</td>
<td>-00:08</td>
<td>09:35</td>
<td>09:47</td>
<td>09:55</td>
</tr>
<tr>
<td>KF773</td>
<td>08:11</td>
<td>08:21</td>
<td>09:01</td>
<td>09:11</td>
<td>+00:09</td>
<td>09:21</td>
</tr>
<tr>
<td>KF774</td>
<td>08:11</td>
<td>08:20</td>
<td>09:01</td>
<td>09:11</td>
<td>+00:04</td>
<td>09:29</td>
</tr>
<tr>
<td>KL3981</td>
<td>08:21</td>
<td>08:31</td>
<td>09:11</td>
<td>09:29</td>
<td>09:34</td>
<td>09:38</td>
</tr>
<tr>
<td>KL3982</td>
<td>08:21</td>
<td>08:30</td>
<td>09:11</td>
<td>09:29</td>
<td>09:34</td>
<td>09:38</td>
</tr>
<tr>
<td>LH008</td>
<td>07:23</td>
<td>07:33</td>
<td>08:13</td>
<td>08:28</td>
<td>08:33</td>
<td>+00:06</td>
</tr>
<tr>
<td>LH011</td>
<td>07:23</td>
<td>07:39</td>
<td>08:13</td>
<td>08:28</td>
<td>08:33</td>
<td>-00:03</td>
</tr>
<tr>
<td>LH038</td>
<td>07:38</td>
<td>07:48</td>
<td>08:28</td>
<td>08:43</td>
<td>08:48</td>
<td>+00:05</td>
</tr>
<tr>
<td>LH043</td>
<td>07:38</td>
<td>07:48</td>
<td>08:28</td>
<td>08:43</td>
<td>08:48</td>
<td>-00:03</td>
</tr>
<tr>
<td>LH040</td>
<td>09:06</td>
<td>09:18</td>
<td>-00:38</td>
<td>08:28</td>
<td>08:41</td>
<td>+00:05</td>
</tr>
<tr>
<td>LH045</td>
<td>09:06</td>
<td>09:18</td>
<td>-00:38</td>
<td>08:28</td>
<td>08:41</td>
<td>-00:03</td>
</tr>
<tr>
<td>LH091</td>
<td>07:31</td>
<td>07:41</td>
<td>08:21</td>
<td>08:41</td>
<td>08:41</td>
<td>+00:05</td>
</tr>
<tr>
<td>LH092</td>
<td>07:31</td>
<td>07:41</td>
<td>08:21</td>
<td>08:41</td>
<td>08:41</td>
<td>-00:03</td>
</tr>
<tr>
<td>LH095</td>
<td>-00:05</td>
<td>09:31</td>
<td>09:41</td>
<td>10:26</td>
<td>10:29</td>
<td>10:39</td>
</tr>
<tr>
<td>LH4486</td>
<td>-00:12</td>
<td>09:39</td>
<td>09:47</td>
<td>10:37</td>
<td>10:39</td>
<td>10:51</td>
</tr>
<tr>
<td>LH2037</td>
<td>07:33</td>
<td>07:43</td>
<td>08:23</td>
<td>08:43</td>
<td>08:43</td>
<td>+00:05</td>
</tr>
<tr>
<td>LH2036</td>
<td>07:33</td>
<td>07:40</td>
<td>08:23</td>
<td>08:43</td>
<td>08:43</td>
<td>-00:03</td>
</tr>
</tbody>
</table>
Airport Performance Mgmt. – Sub-Processes

APM maintaining the process overview

Drill-Down via XPDL language

TMAN A at Ground Handler A

TMAN B at Ground Handler B
# Airport Performance Manager – KPI & Flow

## KPI Spidercharts as f(t)

## Ops. Constraints as f(t)

## Ops. Strategies as f(t)

## Add. Dwell Times as f(t)

<table>
<thead>
<tr>
<th></th>
<th>-1h</th>
<th>now</th>
<th>+1h</th>
<th>+2h</th>
<th>+3h</th>
<th>+6h</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>KPI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wx Cap.</strong></td>
<td>40:40</td>
<td>36:42</td>
<td>34:46</td>
<td>31:28</td>
<td>30:30</td>
<td>32:26</td>
</tr>
<tr>
<td><strong>Strat.</strong></td>
<td>27M</td>
<td>27M</td>
<td>27M</td>
<td>09S</td>
<td>09S</td>
<td>09S</td>
</tr>
<tr>
<td><strong>Air</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arr</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dep</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D-Ice</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>T1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sec1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sec2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>T2</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sec1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sec2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gnd</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arr</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dep</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A foundation for integrated processes
APOCH Aspects
## APOC Contextual Situation Awareness

### SIEMENS

<table>
<thead>
<tr>
<th>Time</th>
<th>KPI</th>
<th>Wx Cap.</th>
<th>Strat.</th>
<th>Air</th>
<th>T1</th>
<th>T2</th>
<th>Gnd</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1h</td>
<td></td>
<td></td>
<td>27M</td>
<td>Arr</td>
<td>Sec1</td>
<td>Sec1</td>
<td>Arr</td>
</tr>
<tr>
<td>now</td>
<td></td>
<td></td>
<td>27M</td>
<td>Dep</td>
<td>Sec2</td>
<td>Sec2</td>
<td>Dep</td>
</tr>
<tr>
<td>+1h</td>
<td></td>
<td></td>
<td>27M</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+2h</td>
<td></td>
<td></td>
<td>09S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+3h</td>
<td></td>
<td></td>
<td>09S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+6h</td>
<td></td>
<td></td>
<td>09S</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Weather Conditions

- 27L, 27R: 17kt, 210°

### Time Indicators

- 16:05:28 UTC
- 19:05:28 local

### Additional Information

- ...T2 Security Closure until 16:50 UTC...
- ...Sandstorm expected from 18:00 UTC...

---

APOC videowall is an option, not part of MAOS offer

© 2012 Total Airport Management Suite
Barco – DLR – Inform – Siemens – Stuttgart Airport / associate ATRiCS
www.tams.aero
APOC Integrated Working Positions

Airport

- Seasonal Flight Management
- Operative Flight Management
- Resource Management
- Performance Management
- A-CDM Web Portal
- Workflow Management
- PAX Queues
- PAX Radar
- Terminal View

ATC

- ATFM
- KPIs
- CDM-Milestones
- Taxi-Routes
- Arrivals/Departures
- What-If

GH / Airline

- Turnarounds
- Critical Paths
- Transfer PAX
- A-CDM Integration
APOC Workflow Management

Work Flow Engine

Videowall Workflow Visualization

Workflow Proposal

APOC Duty Manager Managing work flows

APOC Agent

APOC Agent

APOC Agent

© 2012 Total Airport Management Suite
Barco – DLR – Inform – Siemens – Stuttgart Airport / associate ATRiCS
www.tams.aero
APOCH Quick Communication

Running Workflow

Mouseclick

Videoconference with Process Responsibilities
Thank you for your attention

meier.christoph@siemens.com