WebGIS for airfield maintenance at Zurich Airport

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Operations
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Zurich Airport at a Glance

- Opened in 1948
- Location: ~ 10km from City Center
- Traffic 2010: 23Mio Pax (+4.3%) / 263’000 ATMs / 178 Destinations / ~ 35% Transfer Pax / 350’000 to (belly) cargo
- Airside Infrastructure: 3 Runways / 3 piers / ~ 100 ACFT stands
- Landside traffic: 17’000 parking spaces / 6th largest railway station in Switzerland / One of the busiest bus stations in Switzerland
- 3rd largest shopping center in Switzerland (120’000 sqm office space, 143 shops, 52 F&B outlets)
- Substantial political issues regarding noise
Zurich Airport: current projects

- Re-building of pier B
- Centralized security control
- The circle at ZRH
- ACFT stands expansion
- Ground runup enclosure (engine test facility)
GIS development: initial project goals (2004)

• To provide analytical and visual support for Ops Engineering, Noise, Legal, Environment, Planning, Economics & Politics Divisions with geographic Information

• „Insourcing“ of GIS work

→ Application focus was on "Science & Engineering" (vs. Focus on commercial / operational needs in other spatial info systems)

→ Airfield maintenance had their own (external) NIS for utilities, other airfield infrastructure had not been covered adequately by any GIS
GIS use cases: Noise analysis

To find out, how many inhabitants are subject to noise above the threshold of environmental legislation, the population data is queried spatially (if inside the relevant isophones) and by attributes (if in aplicable sensitivity zone), then summarized.
GIS use cases: 3D Obstacle Surfaces
GIS Development: from expert system to Enterprise GIS
Project goals and sub-projects (2009)

**Goals:**
- Put GIS/NIS on a common platform to increase efficiency of data usage
- Support airport maintenance and operation with GIS
- Enable future applications (e.g. mobile GIS)

**Sub-projects**
- Migration of NIS data
- WebGIS development
- Interface to SAP PM
WebGIS: system requirements

Technical requirements:
• Browser-based, no Plugins etc. needed
• Bi-directional interfaces to external applications (SAP and others) possible
• Mobile access through WLAN / GSM possible
• about 100 users (10 simultaneous)
• Strong integration with desktop GIS and GIS database (data, symbolisation)

Functional requirements:
• Navigation (pan, zoom, search, query)
• Toggle layers
• Customizable views
• Customizable forms
• Customizable printing and reporting
• Editing (simple features only)
  (the usual stuff..)
System design choice

Questions:
• Do we have the resources to master the complex technology?
• Cost-effectiveness?
→ In-house deployment or outsourcing of WebGIS?

Answers:
• Security concerns about outsourcing
• In-house deployment is more efficient on the long run
Software choice

Questions:
• What do we need on top of SDE to develop WebGIS applications?
• Alternatives to expensive AGS licenses? (OSS?)

Answers:
• For our intended WebGIS applications, OSS is not a viable alternative because of:
  • Poor integration with existing (ESRI) GIS software
  • No implementations of complex symbology in utility drawings available
  • WebOffice by Synergis is a suitable WebGIS application framework
WebGIS features: cached base image, live overlays

client-side transparency setting: 30%  50% transparency
WebGIS features: markings and signs
WebGIS features: complex symbology
WebGIS features: attribute queries & - forms
WebGIS features: sketching & printing
WebGIS authoring tool (WebAuthor)

- Configuring, not coding!
- Various wizards
- Fully integrated with ArcMap
- Consistency checks
- configurations are saved as XML files → readable and portable
WebGIS User Management
WebGIS experiences

**Strengths:**
- Stability and performance
- 100% compatibilty of all symbology between ArcMap, AGS and WebGIS clients
- Intuitive, easy-to-learn user interface
- WebGIS shows live data, not time-lagged publication data
- Powerful authoring tool
- Software is well documented

**Weaknesses:**
- Multitude of software components makes maintenance and troubleshooting difficult
- No support for 3D data
WebGIS usage: map requests / day

Map Requests / Day

- Utility NIS
- Airport Map

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GIS - SAP PM interface use cases

• Find SAP functional locations in WebGIS map
GIS - SAP PM interface use cases

- Show existing tickets on functional loc.
- Create new tickets on functional loc.
GIS - SAP PM interface use cases

• Create / modify tickets on free locations
Conclusions & outlook

• Integration of utility NIS and introduction of WebGIS have boosted the usage of GIS
• Enterprise GIS is different from expert GIS…
• A Standard WebGIS implementation works well for standard use cases of any infrastructure operator
• Many spatial information requirements of airports are indeed very similar to those of other infrastructure operators
• However, aviation specific needs are not (yet) well supported (e.g. airport features, 3D objects, …)

Outlook: Potentials for future development
• „Airports Module“ for ArcGIS?
Thank you for your attention

Questions?