FREQUENTIS – FOR A SAFER WORLD

Income generation through modern AIM infrastructure
When ICAO was established at the Chicago Convention 1947 Chicago Convention through which ICAO was created 1947 – each state shall be responsible for the air navigation services in its territory.

There was no specific form defined what type of organizations those air navigation services shall be and until recently they used to be governmental institutions all around the globe.

Striving for more efficient services, many countries have transform their ANSP into state-owned companies or privatised organizations organisations.
Today, over 50 countries have commercialized their ANSP which has introduced tremendous dynamics and innovation into the domain – introducing new funding structures and economic concepts.

- Free to engage in business with other organizations in a more liberalized environment
- Good basis to increase effectiveness and efficiency in a business environment
- Torn between the still strong regulatory boundaries and the pressure from a more and more liberalized market
ANSPs under Pressure

ANSPs are under pressure to become more efficient just like other private companies. This means:

→ Cutting costs
  – Effective infrastructure and processes
  – Avoiding cost center structures and/or lack of cost-value relationship

→ Being profitable
  – Tailored pricing for the services
  – Finding new business areas to generate revenue
→ **ANSPs under Pressure**

But at the same time, ANSPs have still a high responsibility to fulfill

→ **Increase quality**
  - No profitability on the expense of quality
  - Safety first!

→ **Manage ever-growing volumes in traffic and data**

→ **Manage to fulfill new regulations**
AIM Cost Center

This proves to be especially difficult in the area of AIM Aeronautical Information Management has traditionally been a pure cost center.

**Bundled services** are typically covered through a percentage of route charges.

Additional Capex/Opex caused by an increasing depth and width of scope (eg eTOD, AIXM5.1, EU Reg 73/2010, Safety,....) are an additional burden causing a lack of transparency.
Increasing Transparency

Important to **unbundle** the service package in order to separate…

- the „classical“ regulatory services that have to be provided as a core task

- Value-add services that do not necessarily form a part of the core AIM mandate

- Identify, shapen and extent those value-add services that could serve as a basis for revenue generation
The View of a System Provider

We are well aware that products are not the only essence necessary for a successful AIM service but they are essential ….

Technology and new processes can have a tremendous even disruptive effect

Technology is there and can be applied to improve business
The Technology

Disruptive new business models and technologies have helped organizations in other domains to increase overall efficiency and ROI tremendously.

We see how this has also changed:
- our private life
- entertainment industry
- banking sector

Through mechanisms of remote access, cloud structures, consumption of services, IT data parcs, …
Examples - Billing

- Often an inflexible income model
  - dependant on fixed user charges

- Making maximum use of available data
  - Capturing data from various sources
  - Integrating flight data management and accounting systems

- Tailor-made pricing
  - Definition of service and user categories
  - Definition of charging policies

- Automation of the billing process
→ Examples – Webshop / Internet Briefing

→ State-of-the-art webshop
  – Platform to offer value-added services/products

→ Graphical presentation of routes and data

→ Integrated briefing
  – Integration of graphical MET information

→ Access through internet and apps of various mobile devices
Examples – Workflow / Originator Management

- Increasing **efficiency** and **quality** through the usage of collaboration management components
- Using the inherent flexibility to shape the system according to the need and skills of your organization
- Managing in-house stakeholders and 3rd party data suppliers
- Clear definition of responsibilities – **delegation** of tasks to originators
- ADQ1 – Portal based originator management
Definition of the standard Aeronautical Information Publication is given by Annex 15. Amendment 38 will probably allow to make data sets available instead of processed data (eg in the form of charts)

**Rendering and preprocessing** of data becomes a **value-add service** and allows the creation of digital products.

Using the **same production process** and the same data sources of our flexible AIP / Charting system to create value-add by-products for specific users.
Examples – AIM services consumption

Fundamental **ROI analysis** of the AIM processes and services:

- **Hosting AIM Hardware**

- **Sharing AIM Software**
  - AIXM5.1 has shown how difficult it can be to achieve new standards
  - Further developments like Digital Briefing and Digital NOTAM are coming
  - EAD good example. The Centralized Service program of Eurocontrol is aiming at cost reduction through sharing of infrastructure that goes beyond traditional AIM

- **Sharing AIM Services**
  - Especially small countries can not afford to train an AIM team just to manage the limited data that their airspace consists of
  - Getting specialists to become more cost-effective
The AIM network

Sharing Data World-wide
SMARTAIM OVERVIEW
smartAIM Functional blocks
→ smartAIM Functional blocks
smartAIM short Term Information

- (digital) NOTAM AIXM
- (digital) Briefing
- (digital) Weather
- (digital) Flight Plans
- smartINMO NOTAM Mgt
- smartINMO Briefing
- smartWeather
- smartINMO Flight Plan Management
→ Short Term Information Management

→ NOTAM / Digital NOTAM – AIXM: smartINMO – NOTAM Management
→ Weather – WXXM: smartWeather
→ Briefing: smartINMO Briefing and smartIBS (Internet Briefing)
→ smartAIM Long Term Information

smart™ AIM

Long Term Information

- AIXM Information Management
- Terrain / Obstacles
- Reporting
- GIS
- smartDM
- smartETOD
- smartDM Reporting
- smartDM GIS
Long Term Information Management

- AIXM data management: smartDM
- GIS Visualisation: smartDM GIS
- eTOD: smartETOD
smartAIM Publications / Comm / Traceability

smart™ AIM

- Publications
  - AIP
  - Charts
  - Publication Management
- Traceability
  - ADQ
- Communication
- Workflow Management
- AFTN / AMHS
- smartWFM
- smartAIM
- smartCharting
- smartWebClient
- PAMS
- smart Messenger
→ Publications

→ Charting: smartCharting
→ AIP Authoring: smartAIP
→ Document Management: smartWebClient
Workflow Management – Flow automation

Data chain automation from originator to end-user: smartWFM
Messaging

AMHS, AFTN, SWIM Gateway: smartMessenger
Challenge Area: Regulatory Compliance
Challenge 1: In Europe: ADQ – Aeronautical Data Quality

→ ADQ prescribes a certain data model (AIXM 5.1 – not explicit but implicit)

→ Strong traceability from data originators required

→ Software needs to comply with ED153 – SWAL 3 → very expensive and difficult for small vendors
→ Solution 1: smartDM

→ smartDM is an ATM grade AIXM 5.1 data management solution

→ Fully compatible with SWIM standards
  - data model and
  - service model

→ Real SWAL 3 compliance (independently confirmed)
  → no risk

→ Huge customer base
→ Solution 1: smartWFM

→ smartWFM automates AIM workflows from data origination to deployment
→ Full traceability
→ ADQ compliance
→ Flexible adaptation of workflows and associated forms
→ No media breaks → reduced risk of human error
→ Effort for data collection only once, where it is necessary
Solution 1: smartWFM

- smartWFM allows a very high degree of automation
- direct read-out from survey equipment to avoid manual entry errors
→ Challenge 2: eTOD

→ ICAO Annex 15 requires collecting large amounts of terrain and obstacle data

→ Information from surveyors first needs to be transformed and converted for use in AIM context

→ GIS expertise in operators required
Solution 2: smartETOD

- smartETOD provides a cost effective, simple and proven solution for eTOD
- Full standard compliance makes integration with other products easy and seamless
- Tailored workflows automatically prepare geo data sets from surveys for use in AIM
- No detailed GIS knowledge required
smartETOD – Electronic Terrain and Obstacle Database

GIS connector

eTOD Database

Geodataserver

LAN/VPN

GIS Fat-client
ArcMap + GTO Desktop
read/write

Web-Server
(Map server, Application server)

(INTRANET
Web-Services
WFS/WMS/WMTS)

GIS Web-Clients
read only
(browser)

GIS Clients
read only
(services)
Challenge 3: Interoperability

- Information needs to be exchanged between systems
- Integration with custom interfaces is very cost intensive
- Problematic between different vendors
Solution 3: SWIM Node

- SWIM defines the data model and service model
  - HOW: service model
  - WHAT: data model

- By using SWIM standards to ensure the interoperability, integration efforts can be reduced

- Information exchange can be enabled for safety and efficiency reasons

- The Frequentis SWIM Node can provide standardised connectivity and access to SWIM

- Legacy services can be made SWIM compliant
Solution 3: SWIM Node

The SWIM Layer is a SOA based ATM system featuring the Policy Enforcement Point (PEP) at the center of the SWIM-Node’s technical implementation. It provides facilities for authorization, encryption, validation and data mediation / protocol translation to SWIM Enabled ATM Systems.
→ Challenge 4: AMHS compliance required

→ AFTN shall be de-commissioned
→ Even though it is seen as a transition technology, solutions on the market are complex and expensive
→ Significant impacts on operations
Solution 4: smartMessenger

- smartMessenger is the fastest AMHS implementation on the market
- simple and robust solution
- highly available and efficient
- cost effective
- compatibility both with AFTN and AMHS
- very fast and painless deployment
- low to no impact on operations
Challenge 5: New Standards for Weather information

→ SWIM requires compliance with WXXM / IWXXM
→ Existing systems do not support this yet
→ Connected systems may still require compliance with legacy standards
→ Solution 5: smartWeather

→ smartWeather is designed to acquire and store all types of weather data and products.

→ The system catalogues and stores the data in a central repository database making it available to be accessed by users and/or other applications and systems.

→ It provides compatibility to both legacy and new standards.
Challenge Area: Costs for Systems and Maintenance
Challenge

The total cost of ownership of modern systems is significant

Cost factors include: hardware, software licenses, training, migration, hosting, support staff, energy, disaster resilience, upgrade costs
→ Cloud Services

→ Costs can be avoided by utilizing IT outsourcing (system / software as a service)

→ All components of smartAIM can be provided as service or can be owned and operated by the customer
Challenge Area: Additional Income from AIM
Additional Income from value-added Services: Briefing

- Internet Briefing: smartIBS
- fully flexible and customisable
- payment module and web-shop included
- value-add through additional services beyond Annex 15 requirements
- better integration of tailored weather products, mobile support, graphical output
- sophisticated notifications for maximum convenience
Additional income from tailored publications

- Use of smartAIP and smartCharting to make:
  - airline specific charts
  - moving map electronic data sets
  - electronic flight bags
  - customer specific document types
  - specifically tailored eTOD data
- beyond ICAO requirements
Thank you for your attention

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