UAE SWIM Gateway System

Air Traffic Flow Management Task Force

ATFM TF/1

Muscat, Sultanate of Oman
Date 23 - 25 September 2018
UAE ATM Strategy

- Effective cooperation and collaboration between the ATM Community Members on various levels
- Support for ICAO’s Global Air Traffic Management (ATM) Operational Concept and Global Air Navigation Plan (GANP)
- The adoption of the ICAO Aviation System Block Upgrade (ASBU) programme
- Enhanced ATM services for UAE airports
Need for Data Sharing and Consolidation

- Pre-Requisite for Collaboration is Common Knowledge about the Situation
- To support right decisions the Common Knowledge about the Situation has to be based upon Consolidated Information
- Such information has to use aggregate available data from all relevant data sources.
- The Data is available in separate data stores and are fragmented in legacy systems design.
Objectives for the SWIM Gateway

► Access to High Quality, Consistent and Consolidated Flight Related Information
  ► Flight Objects as perceived by GCAA Sheikh Zayed Air Navigation Centre
  ► Allow Stakeholders to amend Flight Objects with additional information
  ► Support bi-directional interfacing to Eurocontrol Network Manager

► Standardised and Open Interfaces
  ► SWIM Platform compliant to Yellow Profile
  ► Use of FIXM as a means for external data presentation

► Expandability
  ► Supporting Dynamic Attributes, even in FIXM input and output without need for software modifications
  ► Application Programming Interface for additional Business Logic
  ► Supporting Collaborative Decision Making by providing the Data Exchange Service in an open, easily accessible data format.
  ► Enabler to grow a national, regional and inter-regional SWIM landscape
Flight Related Information Sharing

▶ Requirements from Stakeholders
  ▶ Validated and Consistent flight plan data
  ▶ Accurate Traffic Forecast
  ▶ Accurate Prediction of Landing Times based on AMAN timings
  ▶ Departure slot times (CTOT) and dynamic slot availability
  ▶ Data shall be available in real-time and as direct system-to-system exchange
  ▶ Web Access for data browsing

▶ Accessibility to Information
  ▶ Secured Public Internet Connections instead of costly private networks
  ▶ Open Interfaces and long term roadmap to assure investment security

▶ Pioneering Stakeholders
  ▶ Dubai Airports
  ▶ Abu Dhabi Airports
  ▶ Other UAE Airports
  ▶ UAE National Airlines
  ▶ IATA (In discussion)
Data Sources at Sheikh Zayed Air Navigation Centre

- AMHS/AFTN
  - Detailed Flight Plan
  - Specific Updates

- FDPS
  - Tactical Flight Details
  - Route Updates
  - Actual Times and Estimates

- AMAN
  - Landing Information
  - Runway
  - Assigned Landing Time

- DFLOW
  - Departure Sequence
  - Calculated Take Off Time

- Airline Schedule
  - Early information
  - Placeholder for Planning

- Eurocontrol
  - Flight Progress
  - Estimates

Cloud of Flight Data
Implementation Challenges

► Data Silos in fragmented designs of Legacy Systems
  ► Applications use individual Data Models and unconnected Flight Life Cycles
  ► Use of Proprietary Data Formats
  ► Inconsistencies between Systems
  ► Data Duplications

► Need for Flight Validation Checks
  ► Use of AIM Data published in AIXM format
  ► Identification and Correction of Data Corruptions
  ► Removal of Duplicates

► Data Consolidation

► Cyber Security (ADCS)
Implementation of the SWIM Gateway

► IFPS Functionality
  ▶ Only validated Flight Plans are forwarded
  ▶ If necessary, centralised correction within the Gateway is performed prior forwarding

► Consistent Flight Object Database
  ▶ All data about a flight from various sources is consolidated in a single System “Flight Objects”

► Enables Collaboration Services including ATFM
  ▶ SWIM Gateway provides consistent and up-to-date flight information
  ▶ Flight Objects supports concepts for individual flights such as Ground Delays, User Driven Prioritisation, and i4D trajectories
  ▶ Consolidated Flight Objects database allow accurate demand forecast based on all available information

► Extendable
  ▶ Open System Architecture
  ▶ Application Programming Interface for Custom Extensions
  ▶ Capacity to cover larger airspace by uploading additional AIM information.
Implementation Status

► SWIM Gateway has received Operational Approval as of 10 September 2018
  ► Target Date for operation 25 September 2018

► Cornerstone for a SWIM enabled System Landscape
  ► Application independent System Flight Object Store
  ► Bridging between legacy systems and SWIM architecture
  ► Enabler for future Building Blocks and enhanced Applications that are SWIM capable
    ► A-CDM and AODB Systems
    ► ATM Automation System
    ► Collaborative ATFM
  ► Supporting National, Regional and Inter-Regional Connectivity
Outlook

► The SWIM Gateway …
  ► Validate Flight Plans against AIXM encoded airspace information
  ► Inform Flight Plan Originators through Operational Reply Messages about the processing status of filed Flight Plans
  ► Distribute validated Flight Plans to ATSU using AMHS/AFTN
  ► Distribute validated Flight Plan as FIXM to stakeholders via IP networks using SWIM technology
  ► Maintain a Flight Objects containing all flight related information and updated all connected client systems
    ► FIXM System to System Interface
    ► Web Browser Interface
  ► SWIM Gateway is able to encode ATFM related information
  ► SWIM Gateway may act as inter-regional flight related information exchange
Thank You