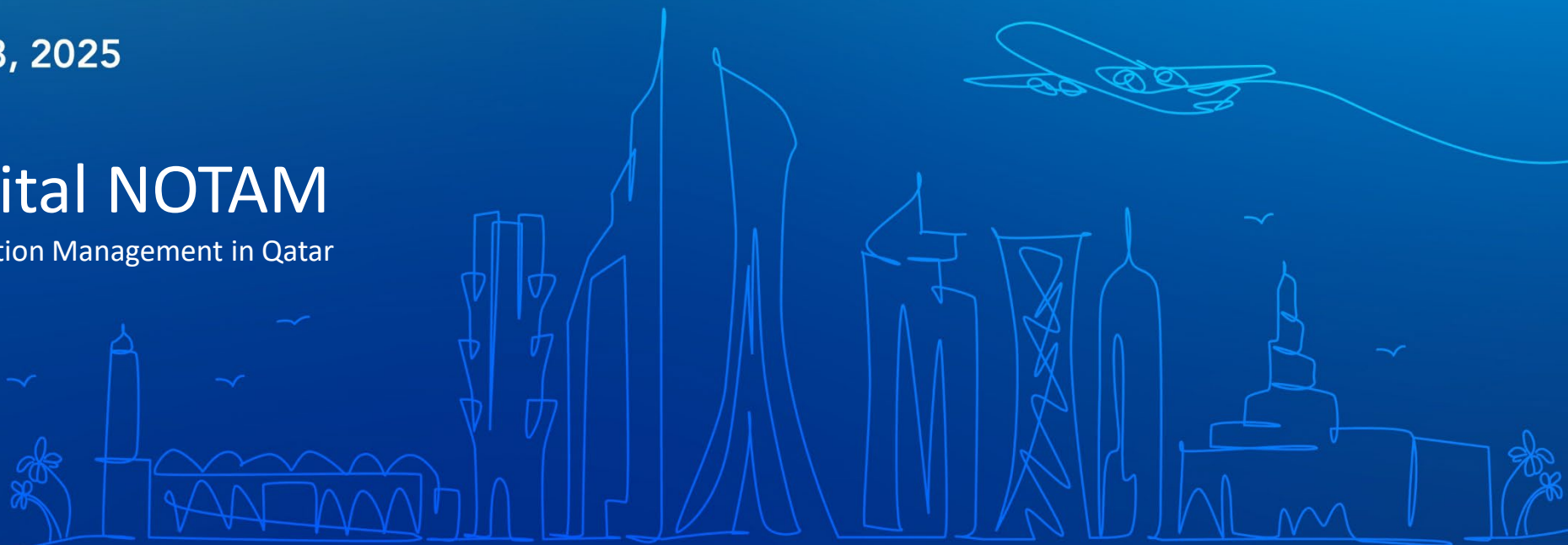


# MIDANPIRG/22 & RASG-MID/12

Doha, Qatar | May 4-8, 2025

## SWIM and Digital NOTAM

Advancing Aeronautical Information Management in Qatar



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Advancing Aeronautical Information Management in Qatar

# SWIM and Digital NOTAM

Pamela Erice, AIM Supervisor

Air Navigation Department, Qatar Civil Aviation Authority



# Presentation Content

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**01** SWIM Implementation

**02** Digital NOTAM Implementation

**03** Challenges & Mitigation

**04** Conclusion







# 01

## SWIM IMPLEMENTATION

SWIM service aimed  
to facilitate better  
information sharing in  
ATM and Aeronautical  
Information domains

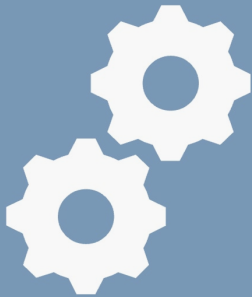


### Aeronautical SWIM Service

Phase 1: Operational Trial

Phase 2: Full Implementation



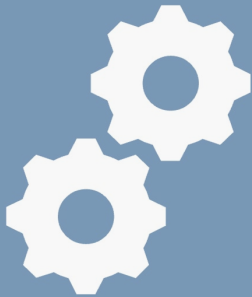


## SWIM IMPLEMENTATION

### Key Features

- backbone for connecting all stakeholders
- supports globally available SWIM Technical Infrastructure Specifications
- supports aviation information exchange models





# SWIM IMPLEMENTATION

## Compliance

Layer of Framework	Function of Sublayers	Standards, Models, Implementations
SWIM-enabled Applications		ATS, ATFM, Airline Ops
Information Exchange Services	Interface Definition	OGC, WSDL, WADL, WFS, WMS, WCS
Information Exchange Models and Schemas	For aeronautical, MET, and flight information	AIXM, WXXM, IWXXM, FIXM
	Semantic interoperability	OWL, SKOS
SWIM Infrastructure	Enterprise Service Management	JMX, SNMP
	Policy	WS-Policy Standards
	Reliability	WS-RM & WS-RM Policy
	Security	WS-Security & SSL
	Data Representation	XML, XSD, GML
	Messaging	SOAP, JMS
	Transport	HTTP, JMS, MQ
	Service Registry	UDDI, SWIM Service Registry Specification, IALA G1128
Network Connectivity	Secure Network Connectivity	IPv4, IPv6
	Naming and Addressing	DNS





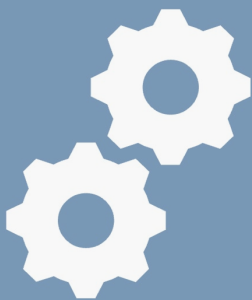
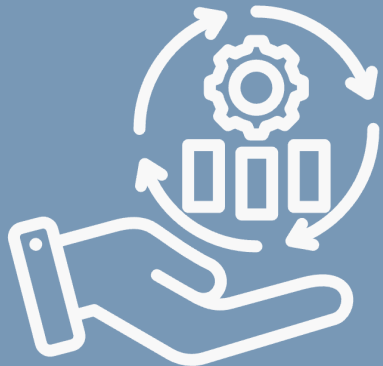
# SWIM IMPLEMENTATION

## Core Services

SWIM Core Service	Core Service Functions
Interface Management	Service Exposure
	Service Discovery
	Metadata Management
Messaging	Publish / Subscribe
	Request / Response
	Reliable Messaging
	Message Routing
	Mediation
	Message Transport
	Message Confidentiality
Security Services	Message Integrity
	Transport-level protections
	Identity Management
	Data Access Management
	Security Policy Management
	Security Policy Enforcement
	Security Monitoring
	Security Auditing
Enterprise Service Management	Configuration Management
	Event and Performance Management
	Policy Management







## SWIM IMPLEMENTATION

### Building Blocks

Building Block	Covered by
Information	Encoded in AIXM 5.1, iWXXM, and FPL
Services	CADAS-AIMDB provides AIXM 5.1 data sets and digital NOTAMs
	CADAS-ATS provides an FPL distribution service
	CADAS-ATS / AMHS provides an iWXXM distribution service
Technical Infrastructure	MosaiX SWIM API Manager and Message Broker
Public Key Infrastructure	MosaiX SWIM via OpenXPki and Keycloak
SWIM Registry	MosaiX SWIM - SWIM Registry





### SWIM Service Registry

- repository of information regarding services that meet the SWIM standards.
- descriptions that help service consumers efficiently find services
- SWIM Service Registry Access
  - ⇒ human readable format (via browser)
  - ⇒ B2B interface by means of REST API (via HTTPS protocol)

## 02 DIGITAL NOTAM IMPLEMENTATION

Event data into a structured, machine-readable format using AIXM 5.1 standards

**Preview**

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<message:AIXMBasicMessage gml:id="gmlns68" xmlns:usecase="http://www.comsoft.aero/cadas-aimdb/usecase"
xmlns:cac="http://www.comsoft.aero/cadas-aimdb/common" xmlns:cae="http://www.comsoft.aero/cadas-aimdb/extension"
xmlns:gml="http://www.opengis.net/gml/3.2"
xmlns:gts="http://www.isotc211.org/2005/gts" xmlns:message="http://www.aixm.aero/schema/5.1/message"
xmlns:aixm="http://www.aixm.aero/schema/5.1" xmlns:ns20="http://www.opengis.net/xf/2.0"
xmlns:gco="http://www.isotc211.org/2005/gco"
xmlns:ns7="http://www.aixm.aero/schema/5.1/extensions/EUR/ADR"
xmlns:ns13="http://www.comsoft.aero/cadas-aimdb/extension/dnotam/5.1-d"
xmlns:ns9="http://www.comsoft.aero/cadas-aimdb/extension/adr/5.1"
xmlns:ns12="http://www.comsoft.aero/cadas-aimdb/dnotam-ext/5.1-d"
xmlns:fes="http://www.opengis.net/fes/2.0" xmlns:caiw="http://www.comsoft.aero/cadas-aimdb/caiw"
xmlns:event="http://www.aixm.aero/schema/5.1/event" xmlns:sdp="http://www.comsoft.aero/cadas-aimdb/sdp"
xmlns:ns19="http://www.opengis.net/ows/1.1" xmlns:xlink="http://www.w3.org/1999/xlink"
xmlns:gmd="http://www.isotc211.org/2005/gmd">
  <message:hasMember>
    <event:Event gml:id="gml1">
      <gml:identifier codeSpace="urn:uuid:">905b3012-5aa9-4232-95a5-f10796e1ac1c</gml:identifier>
      <event:timeSlice>
        <event:timeSlice gml:id="gml2">
          <gml:validTime>
            <gml:timePeriod gml:id="gml3">
              <gml:beginPosition>2025-02-09T07:00:00.000Z</gml:beginPosition>
              <gml:endPosition>2025-05-04T07:00:00.000Z</gml:endPosition>
            </gml:timePeriod>
          </gml:validTime>
        </event:timeSlice>
      </event>
    </message:hasMember>
  </message>
</xml>
```

**Object details**

Event name: **A0197/25**

Event status: Published

Event validity: 09.02.2025 07:00 - 04.05.2025 07:00

**Event XML**

NOTAM TXT Message(s):

A0197/25 NOTAMN  
Q)OTDF/QM/XLC/IV/M/A/000/999/2516N05137E005  
A)OTHH  
B)2502090700  
C)2505040700  
E)FLW TWY CLSD  
1. PORTION OF TWY R2 BTN TWY S3 AND TWY T8  
2. TWY T9

automatic validation  
reducing human errors  
information accuracy  
faster distribution

# DIGITAL NOTAM IMPLEMENTATION

## Data Availability & Migration



- AIP Data
- Obstacle Data
- Aerodrome Mapping Data
- Instrument Flight Procedure Data

## System Upgrade & Acquisition



- Central AIM Database *Upgrade*
- NOTAM Management System *Upgrade*
- Digital NOTAM System *New*

## Operational Readiness




- Staff Training
- Operational Trial
- Standard Operating Procedures
- Digital NOTAM Services (Message Broker and AMQP 1.0)
- Digital NOTAM Portal



Sign in to QCAA AIM Services x +

← ↻ <https://aim.gov.qa/dowp/> ⚙️ ☆ ... 🌈



الهيئة العامة للطيران المدني  
CIVIL AVIATION AUTHORITY  
قطر QATAR

English ▼

## Digital NOTAM Portal

Username

Password

☐ Remember me [Forgot Password?](#)

[Sign In](#)

[New user?](#) [Register](#)



# 03

## CHALLENGES & MITIGATION

### CHALLENGES

Legacy System Integration

Staff Skill Transition

### MITIGATION

Gradual Migration Planning

Extensive Training Programs



## 04 CONCLUSION



Commitment to modernization



Regional collaboration

## Action by the meeting

### ***Action by the meeting:***

*The meeting is invited to:*

- a) note the SWIM and Digital NOTAM implementation toward Advancing Aeronautical Information Management in Qatar; and*
- b) discuss related matter, as appropriate.*





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# Thank You

