International Civil Aviation Organization

The Fifth Meeting of System Wide Information Management Task Force (SWIM TF/5)

Video Tele-conference, 9 – 11 August 2021

Agenda Item 6: Updates on the assigned tasks by task leads/contributors including progress report and issues

e) Information Services
- Task 6: Information Services

COMPARISON OF INFORMATION SERVICE OVERVIEWS AND PROPOSED APAC VERSION

(Presented by Australia/Hong Kong China)

SUMMARY

This paper presents a review of current SWIM Registries and their metadata fields and compares these to the proposed PANS-IM Service Overview fields. Recommendations are made in respect to additional APAC fields for initial version of APAC Service Overview Specification.

1. INTRODUCTION

1.1 The PANS-IM proposes a set of standard metadata fields for describing SWIM information services in a "Service Overview". States are expected to populate SWIM Registries with such descriptions for each provision of SWIM information service.

1.2 This paper reviews two existing SWM Registries and a recent SWIM TF proposal to compare and contrast the overlap in fields. Based on the comparison result, this paper propose an initial version of APAC Service Overview Specification with specific fields for consideration by APAC States for further standardisation.

2. DISCUSSION

Comparison of Current Service Overviews

2.1 A detailed comparison of the PANS-IM Service Overview fields to the following existing SWIM Registries operated by the FAA and EUROCONTROL and a proposal presented in APAC SWIM TF/3 has been conducted and the result is provided in Appendix A.

- APAC SWIM TF/3 WP/16 "APAC SWIM Registry Approach"
  - https://www.icao.int/APAC/Meetings/2019SWIMTF3/WP16_ROK%20AI3%20-%20SWIM%20Registry%20Approach%20Revised.pdf
- FAA NAS Service Registry and Repository (NSRR)

- https://nsrr.faa.gov/admin/help/ah/nsrr_help
- EUROCONTROL SWIM Registry
  - https://ext.eurocontrol.int/swim_confluence/display/SWIM/Guidance+starting+from+the+schema

2.2 The PANS-IM fields have also been grouped into six broad categories for the comparison:

1. Identifying
2. Descriptive
3. Provenance
4. Security
5. Technical
6. Organisational

2.3 The comparison of the fields has been based on the above descriptions and are "best effort" mappings with feedback from FAA/EURCONTROL colleagues.

2.4 Clearly shown in the comparison is that a large number of Registry fields are used for "Additional" descriptions of the information service and an even significantly larger number of Registry fields are used for "Technical" descriptions.

2.5 There are some clear omissions (direct mappings) for the SWIM Registries related to "Sources of Information" and "Filtering Available".

Proposed Additional Metadata fields for APAC Service Overview Specification

2.6 Based on the APAC SWIM TF/3 WP/16 paper, and although not explicitly mentioned, to support global interoperability of Service Overviews, there is need for each to be uniquely identified (as shown in the FAA fields). Hence, a candidate for APAC standardization would be **"Information Service Identifier"**. This field would be a web Uniform Resource Identifier (URI).

2.7 Also based on the APAC SWIM TF/3 WP/16 paper, and the large number of fields used in the Registries for "technical" information, there is a clear need to describe additional aspects related to technical infrastructure over the current three Technical PANS-IM fields. Hence, a candidate for APAC standardization would be **"Interface Binding"**. This field would be a free text.

2.8 The other key purpose to consider any additional metadata fields for APAC standardization should be undertaken in the context of discovery of information services. That is, the information consumer's need to find services should be the driving requirement. This would then fall into the three main areas of "Information Category", "Information Service Functions", and "Geographical Extend of Information". All of these three fields are free text, and hence, would not provide the capability of a service provider to define explicit structured values (in the form of URIs) to enable service consumers to find specific services.

2.9 As a related example, see the emerging "W3C DCAT Profile for ICAO Aeronautical Datasets" being developed via the ICAO AIM Working Group and will be part of AIS Manual (Doc 8126) Volume 4 available at: https://airservicesaustralia.github.io/dcat-profile/

2.10 In the DCAT Profile document, Section 4.4 discusses how a "Theme" (aka Information Category) can be constructed to support the use of URI values. A similar mechanism can be used for Information Service Functions.

2.11 It is proposed that two supporting fields (for **"Information Category"**, **"Information Service Functions"**) be added for APAC standardisation for these category/function purposes named "Information Theme" and "Functional Theme". These field values would be URIs.

2.12 In the DCAT Profile document, Section 4.6 discusses how "Spatial" (aka Geographical Extend of Information) can be augmented with specific values covering the State, Aerodrome, and Airspace.

2.13 It is proposed that three supporting fields are added for APAC standardisation for these geospatial purposes named **"Spatial State"**, **"Spatial Aerodrome"**, and **"Spatial Airspace"** and follow the DCAT Profile structure.

2.14 The proposed additional Service Overview fields for APAC standardisation would provide greater capability to discover SWIM Information Services, and by reusing the DCAT Profile, ensure consistency and interoperability with future AIM dataset services.

2.15 A draft version of APAC Service Overview Specification, containing the above proposed additional fields, is proposed in Appendix B for consideration and comment by the meeting. It is expected this APAC Service Overview Specification would be a living reference for regular review and update as necessary when new requirements are identified in future.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) review the comparison table in Appendix A;

c) consider the proposed new APAC Service Overviews fields in 2.6, 2.7, 2.11 and 2.13; and

d) review and support the draft version of APAC Service Overview Specification mentioned in 2.15 and listed in Appendix B.

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APPENDIX A – Service Overview/SWIM Registry Comparison

Category	ICAO PANS-IM	APAC SWIM TF/3 – WP/16	FAA	EUROCONTROL
1. Identifying	Information service name	Service Name	Name	Name
	Information service version	Service Version	Service Version	Version
			Global Registry ID	
2. Descriptive	Brief description of the information service	Brief Description of the Service	Description	Service Abstract
	Additional information of the information service	Additional Service Information	Service Summary Service Suite Information Topics Service Background - Location URL (Service Documents) Document Type File (link) Name Upload Date Description Protected Waived Shared With (Service References) Name Description URL	Service Description - Title - Edition - Reference Date Abbreviations - name - description Service Type Intended Consumer Operational Need - Name - Description
	Information Category		SWIM Service Category	Service Categorisation Information Category
	Information service functions	Service Functions	Business Function Real World Effect	Business Activity Type Functionality - Name - Description - Real World Effect
	Geographical extent of information	Geographical Extent of Information		Geospatial Categorisation Geographical Extent - State ICAO Nationality Letters - FIR ICAO Location Indicator - Aerodrome ICAO Location Indicator
				Resource - Type - Name - Description

3. Provenance	Information service lifecycle status	Lifecycle Information	Lifecycle Stage	LifeCycle Stage
	Information service lifecycle date			Date in Operation
	Quality of the service	Quality of Service	QoS parameter name Parameter value Definition Calculation method Unit of measure	Quality of Service - Name - Description
	Information service validation type	Service Validation		Validation of Service - Type
	Information service validation description			Validation of Service - Description
	Source of information	Sources of Information		Concept - Name - Description
			Service Policy Name Reference Location URL	
			(Environmental Constraint) Additional Information Operational Domain	
			Criticality Level	
4. Security	Access restrictions	Access Restrictions		Access and Use Conditions - Type - Name - Description
			Security Mechanism Description Regulating Protocol	Security Mechanism - Name - Description - Type
5. Technical	Message exchange pattern	Message Exchange Pattern	Messaging Model	Application Message Exchange Pattern
	Information exchange model	Exchange Models		Exchange Schema - Name - Schema Language - Reference Information Definition - Name - Description - AIRM Conformant - AIRM Version

	Filtering available	Filtering Available		

		Operation	(Operations)
			Name
			Description
			Message Exchange Pattern
			Idempotency
			Operation Type
			Processing Considerations
			List of measures
				Operation
				- Name
				- Description
				- Idempotency
				- Synchronicity
				- TI Protocol Method
				- Precondition
				- Processing Consideration
				  - Name
				  - Description
				- Operation Message Behaviour
				- Name
				- Description

		Message Header	(Message Header) Name of Defining message Message ID Message Destination Delivery Mode Priority Destination Name List of App Specific Properties	
		Message	(Message) Name Name of defining operation Description Direction Message Body Type Message Header (link) Message Payload (link)	Message - Direction - Name - Description - Is Fault - Headers - Body
		Protocol		TI Protocol Method
		Network Interface	(Service Interface) Name Description Interface Type Messaging Model	Service Interface - Name - Description - Interface Provision Side - TI Primitive MEP - Service Interface Biding - Network Interface Binding - Interface Binding Description
			(Faults) Generated By Fault name and/or code Fault text Fault Description	
			(Message payload) Name of Defining Message List of Entities	

			(Data Entity) Name of Defining Message Namne Description	
			(End Points) Name Description Network Address Binding	End Point - Name - Description - Address - Addressable Resource
			(Binding) Name Description Protocols Location URL	
			(Application Specific Properties) Name Description Permissable values	
			(Data) Data Type Document Type Name/Title Description Version/Revision Exchange Model Target Namespace MIME Type Encoding Protocol Protocol Version Location (URL)	
			(Service Implementation) Name Description End Points	
				Technical Constraint - Name - Description
				Service Monitoring Description

				Service Description References - Implemented Standard - Standard Type - Is Conformant - Title - Version - Conformance Statement - Description - Reference - Service Document - Document Type - Title - Version - Description - References
6. Organisational	Provider organization	Provider Organization	Name Web Page Description	Provider Provider Description Provider Type
	Support Availability	Support Availability		Service Support
	Provider Point of Contact	Provider Point of Contact	Name Title Phone Number Email	Name Description Email Phone Number
			(Service Consumer) Name Web Page Description	

APPENDIX B – Proposed APAC Service Overview Specification

Category	ICAO PANS-IM	Proposed APAC Service Overview
1. Identifying	Information service name	Information Service Name
	Information service version	Information Service Version
		Information Service Identifier
2. Descriptive	Brief description of the information service	Brief Description of the Service
	Additional information of the information service	Additional Service Information
	Information Category	Information Category
		Information Theme
	Information service functions	Information Service Function
		Functional Theme
	Geographical extent of information	Geographical Extent of Information
		Spatial State
		Spatial Aerodrome
		Spatial Airspace
3. Provenance	Information service lifecycle status	Information Service Lifecycle Status
	Information service lifecycle date	Information Service Lifecycle Date
	Quality of the service	Quality of Service
	Information service validation type	Information Service Validation Type
	Information service validation description	Information Service Validation Description
	Source of information	Source of information
4. Security	Access restrictions	Access Restrictions
5. Technical	Message exchange pattern	Message Exchange Pattern
	Information exchange model	Information Exchange Model
	Filtering available	Filtering Available
		Interface Binding

6. Organisational	Provider organization	Provider Organization
	Support Availability	Support Availability
	Provider Point of Contact	Provider Point of Contact