International Civil Aviation Organization

The Seventh Meeting of System Wide Information Management Task Force (SWIM TF/7)

Bangkok, Thailand, 09 – 12 May 2023

Agenda Item 6: State, Regional and Global SWIM Updates

UPDATE ON SWIM SERVICE REGISTRY DESIGN & DEVELOPMENT OF ATMB

(Presented by China)

SUMMARY

This paper presents the design and development progress of SWIM Service Registry of ATMB in China, including information service lifecycle design, information service description metadata extension, SWIM Service Registry functional framework design, and SWIM Service Registry demo development.

1. INTRODUCTION

1.1 According to the definition in the latest version of ***ICAO SWIM Manual Volume II***, SWIM Service Registry is an important component of SWIM GIF and a critical platform for accomplishing centralized management and unified governance of information service.

1.2 In order to implement and construct SWIM Service Registry of ATMB, and conduct pre-research on the interoperability of multiple SWIM Service Registries in different regions (such as SDS, SWIM Discovery Service), ATMB of CAAC has organized special working group on the design and development of SWIM Service Registry.

2. DISCUSSION

2.1 Overall Objectives

2.1.1 SWIM Service Registry requires consideration of rules, standards, activities of information service, and roles, responsibilities of SWIM stakeholders, etc. Therefore, the design and development are mainly divided into four parts: information service lifecycle design, information service description metadata extension, SWIM Service Registry functional framework design, and SWIM Service Registry demo development.

2.2 Information Service Lifecycle Design

2.2.1 Based on the three status of information service defined in the ***ICAO SWIM Manual Volume II***, and further considering the governance process in the information service lifecycle, two additional service status has been added to form information service lifecycle status of ATMB: Prospective, Published, Operational, Stopped, and Retired, as shown in Table 1.

Table 1 Information Service Lifecycle Status of ATMB

Information Service Status	Description
Prospective	Information service provider registers service information, visible to manager of SWIM service registry and information service providers.
Published(Additional)	**Information service has been approved by the manager of SWIM service registry, and is discoverable by service consumers.**
Operational	Information service provider has completed technical preparation, and service consumers can access the information service formally.
Stopped(Additional)	**Information service has stopped running due to failure, maintenance or other reasons.**
Retired	Information service is disposed and no longer in use, service consumers cannot use or subscribe to it.

2.2.2 Accompanied by the definition of information service lifecycle status, the information service lifecycle process was further designed to clarify the standard procedures and execution operations for transitioning between different status. There are five processes: Initial to Prospective, Prospective to Published, Published to Operational, Operational to Stopped to Operational, and Stopped to Retired. The specific process is shown in Figure 1 below.

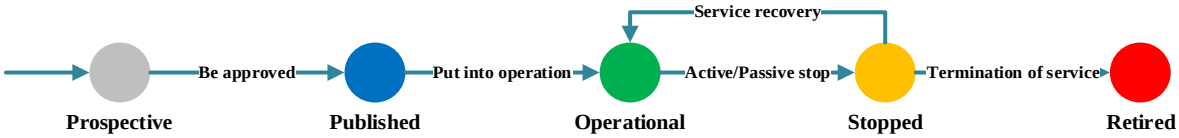

Figure 1 Design of Information Service Lifecycle Process of ATMB

2.2.3 For example, when the status of an information service transitions from “Prospective” to “Published”, the standard procedures and key actions that need to be executed by different roles are defined, including service providers, service consumers and manager of SWIM Service Registry. The details are shown in Figure 2 below.

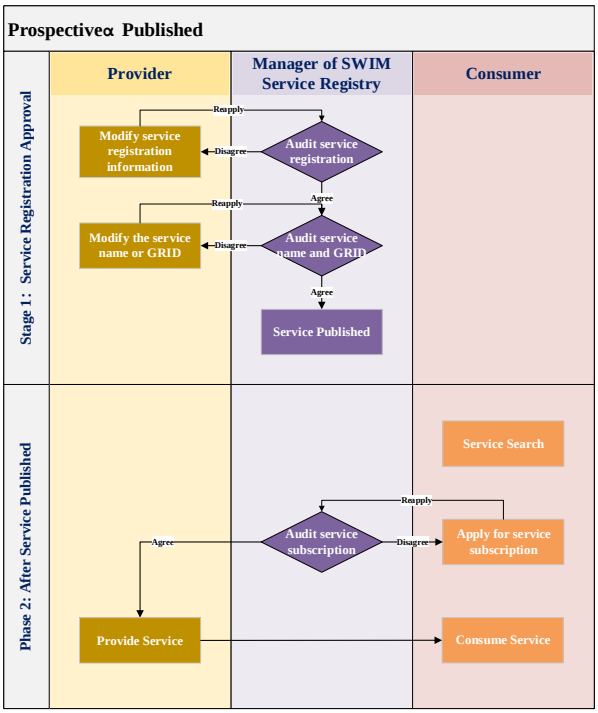

Figure 2 Detailed Design of Information Service Lifecycle Process of ATMB

2.3 Information Service Description Metadata Extension

2.3.1 ***ICAO SWIM Manual Volume Ⅱ*** defines 20 metadata fields for the information service overview. An extended design was carried out for the information service description metadata of ATMB to better meet the domestic requirements for information service registration, approval, and management.

2.3.2 Information service description metadata is divided into three main categories: Basic, Technical, and Management, which are further divided into 14 subcategories, 72 metadata fields, including:

Basic metadata: including four subcategories, namely Service Identification, Service Status, Service Description, and Service Function, with a total of 16 metadata items.

Technical metadata: including five subcategories, namely Service QoS Parameters, Service Interface, Service Interface Message, Service Interface Message Data, and Service Implementation Access, with a total of 30 metadata items.

Management metadata: including five subcategories, namely Service Provider, Service Consumer, Service Governance Policy, Service Access Restrictions, and Service Reference Document, with a total of 26 metadata items.

Details are shown in Figure 3 below, 20 metadata fields have already defined in ***ICAO SWIM Manual Volume Ⅱ*** is marked with ✪ symbol in this figure.

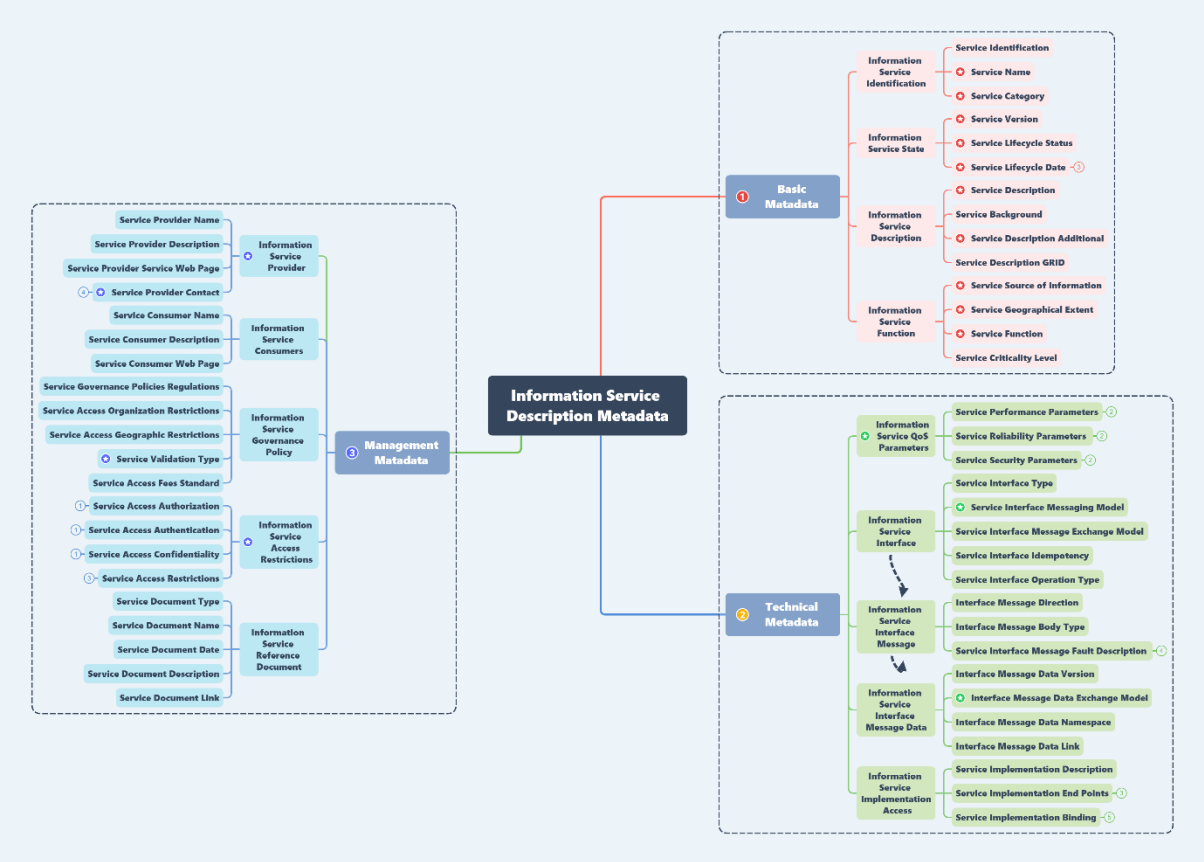

Figure 3 Extension of Information Service Description Metadata of ATMB

2.4 SWIM Service Registry Functional Framework Design

2.4.1 Based on the definition in ***ICAO SWIM Manual Volume Ⅱ***, the functions of a SWIM Service Registry are information service registration, search, filtering, and notification. Around these core functions, further development was carried out for the functional framework of SWIM Service Registry of ATMB.

2.4.2 According to different roles and permissions, the SWIM Service Registry is divided into two sites: the User Site and the Manager Site, both have different functional orientation, as shown in Figure 4.

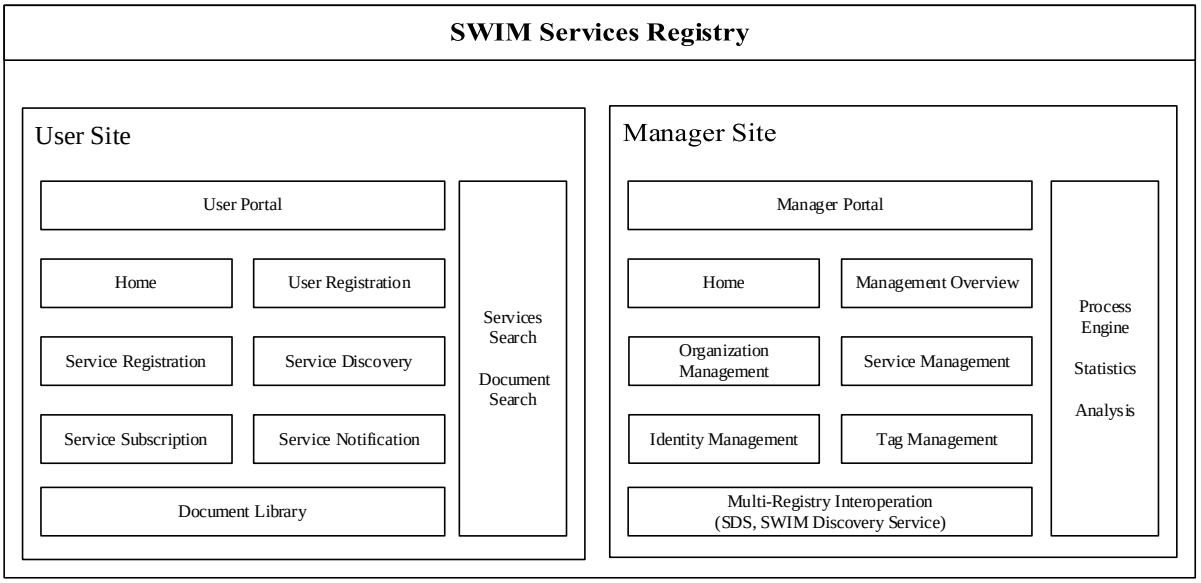

Figure 4 Functional Framework Diagram for SWIM Service Registry of ATMB

The user site targets information service providers and consumers, with the main function of service registration for service providers and service discovery for service consumers. The core functions of the user site include user portal, user and information service registration, information service discovery and subscription, and document library.

The manager site targets manager of SWIM Service Registry, with the main function of SWIM user management and information service management. The core functions of the manager site include organization management, information service management, identity and tag management, process engine, statistics and analysis.

2.5 SWIM Service Registry Demo Development

2.5.1 Based on the design of the SWIM Service Registry functional framework of ATMB, further development work on demo was carried out. The user site demo is shown in Figure 5, and the manager site demo is shown in Figure 6.

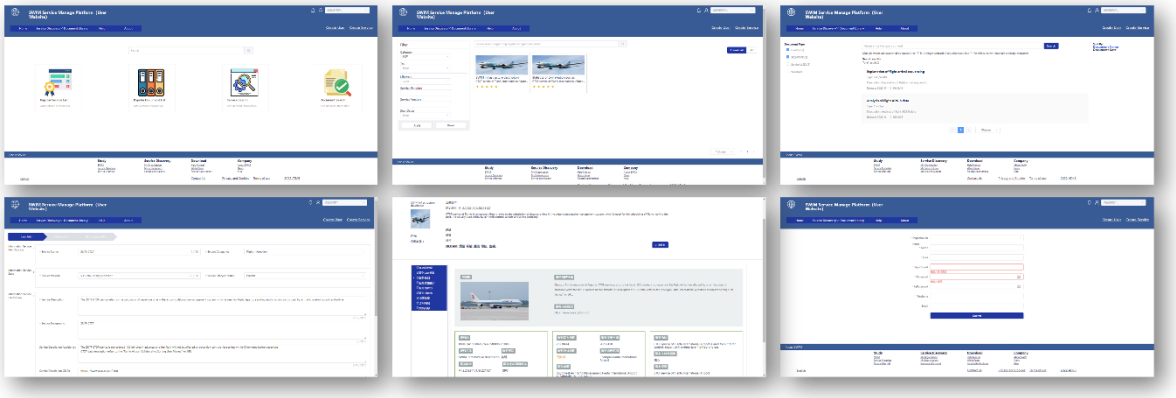

Figure 5 User Site Demo for SWIM Service Registry of ATMB

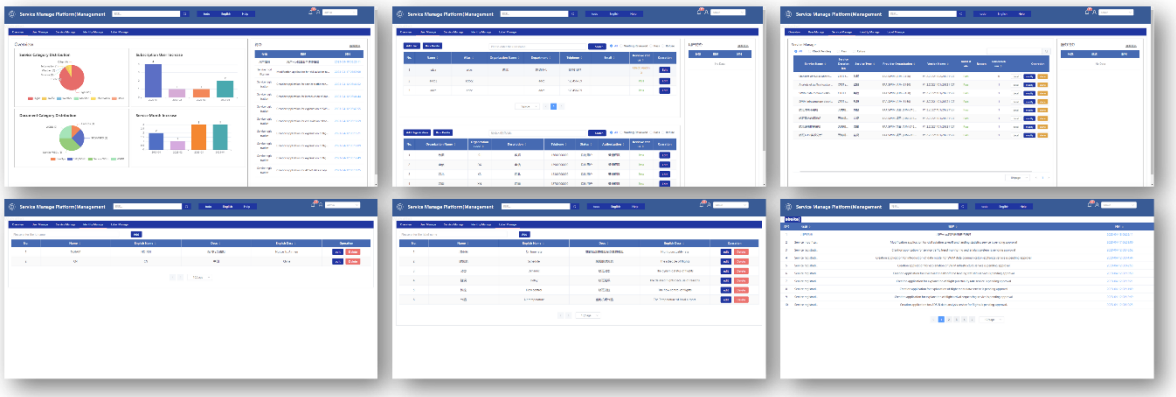

Figure 6 Manager Site Demo for SWIM Service Registry of ATMB

2.5.2 Currently, in order to verify the comprehensiveness, effectiveness, and usability of the SWIM Service Registry functional design, we are organizing information service registration test on the SWIM Service Registry demo.

2.5.3 Subsequently, testing and verification work on the SWIM Service Registry demo will be carried out, and the ***SWIM Service Registry Functional Configuration Guidance of ATMB*** will eventually be compiled and released. It will be the technical foundation to carry out SWIM Service Registry planning and construction of ATMB.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matter as appropriate

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