INTERNATIONAL CIVIL AVIATION ORGANIZATION

TWENTY SIXTH MEETING OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG/26)

Bangkok, Thailand, 7 – 10 September 2015

Agenda Item 3: **Performance Framework for Regional Air Navigation Planning and Implementation**

  3.4: **CNS**

INTRODUCTION TO CHINA SWIM INITIATIVES

(Presented by the People's Republic of China)

SUMMARY

This Information Paper presents SWIM initiatives in China.

Strategic Objectives:
  A: **Safety** – *Enhance global civil aviation safety*
  B: *Air Navigation Capacity and Efficiency—Increase the capacity and improve the efficiency of the global aviation system*
  E: **Environmental Protection** — *minimize the adverse environment effects of civil aviation activities.*

1. INTRODUCTION

1.1   According to ICAO ASBU strategy plan, Globally Interoperable Systems and Data - Through Globally Interoperable System Wide Information Management (SWIM), is one of key Performance Improvement Areas. A global SWIM operation concept is under development. States are encouraged to demonstrate the SWIM capabilities and functions that will meet the needs of the future air traffic management.

1.2   Considering the rapid air traffic growth in China, technical researches have been done to address the challenges faced by current ATM systems. Initial SWIM Study Project is one of projects of China Civil Aviation Collaborative ATM Technology Program, funded by Ministry of Science and Technology (MOST) and Civil Aviation Administration of China (CAAC). It is a four-year R/D project started in 2011 and finished in 2014. The project aims to study and evaluate SWIM concept and key technologies, propose the information management infrastructure for next generation ATM system and demonstrate initial SWIM capabilities.

2. DISCUSSION

2.1   In the Initial SWIM Study project, a demo system has been developed and deployed in Beijing Capital International Airport. Some of operational systems including the Collaborative Decision Making (CDM) system, Meteorological Database, Airport Operation Database and Airline's flight information system connected to the demo SWIM system to publish and consume relevant information for demonstration.

2.2   The project adopted Service-Oriented Architecture (SOA) to design and build up the demo system. An Enterprise Service Bus (ESB) is the heart of system to route XML-based messages among the application systems. To minimize the impact to the operational systems, the demo system uses customized adopters between ESB and the applications, which provide legacy interfaces to existing systems and automatically translate between XML-based information and traditional information.

2.3   Flight plans and weather information was exchanged to demonstrate the basic functionalities of SWIM. A subset of FIXM was used to convey FPL information. Other information was also encapsulated in customized XML messages and then exchanged through demo SWIM system.

2.4   SWIM is the new solution for future ATM industry. The benefits of SWIM have been demonstrated in the project, but some of the challenges associated with the system wide deployment have also been indicated.

2.4.1   SWIM is defined as the IT infrastructure. However, it cannot be implemented by IT architecture and development alone. The domain specialists from various stakeholders need to be involved to develop the requirements and define the services to be deployed at the early stage of SWIM implementation. It is necessary to work closely with AIM, Aeronautical meteorology, Flight/Flow management and airlines at the beginning of system design and development.

2.4.2   One of best practices in SOA solution deployment is applying centralized governance. Under SOA principles, SWIM need a empowered governance in place to manage the lifecycle of services under varying conditions and be able to monitor that service are in fact enhancing the business value. It also mitigates many of the risks by establishing decision rights, guiding the definition of appropriate services. For example, it helps answer the important questions such as:

-         Who owns the data and is there agreement to allow the service access to the data?

-         Who makes a decision on whether a service can be accessible to other   applications?

         While deploying a national SWIM system which extends a wide range of stakeholders including ANSP, Airlines and airports, it is a challenge for governance to control the whole system across various organizations.

2.4.3   The ESB is the key component of SWIM solution, which provides key features needed by SWIM. However, it is seen that today some of the ESB products do not follow the standards. Since SWIM technical and implementation guidelines are to be developed, there are no materials in place providing appropriate direction to decide criteria for ESB product selection.

2.5   The key to addressing the related challenges is to identify them as early as possible and include the appropriate solution in the SWIM architecture to reduce the possibility of re-architecture being required in a post-deployment environment. China would like to share the experiences gained from the initial SWIM study project with others in the upcoming SWIM seminar.

3.   ACTION BY THE MEETING

3.1   The meeting is invited to note the SWIM initiatives in China.

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