SESARFACTSHEET

Information Service Reference Model (ISRM)

System Wide Information Management (SWIM) concerns the interoperable and seamless provision of services between ATM organisations. The provision and use of these services allows for shared use of ATM Information throughout the ATM stakeholder community.
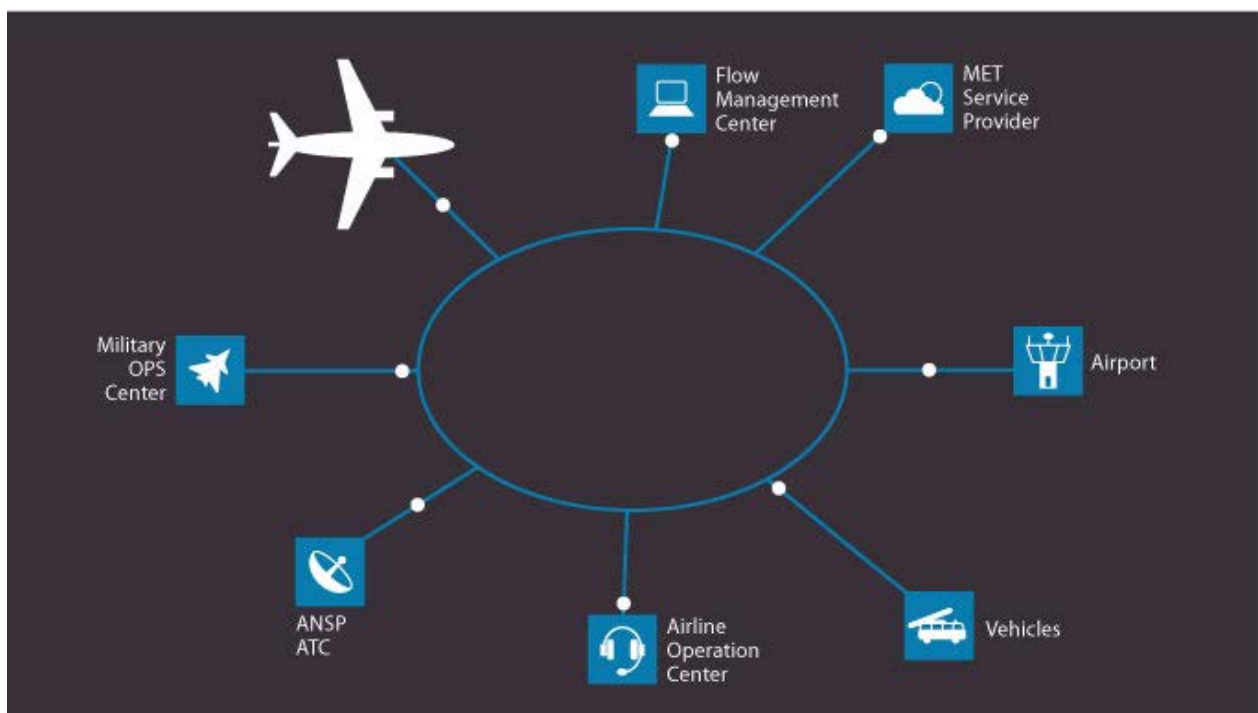

Figure 1: Sharing information through services

The **Information Service Reference model (ISRM)** is a model built collaboratively by the SESAR SWIM community. It provides each service with a complete description in terms of functionality, behaviour and logical interfaces. The information that is exchanged through a service can be traced back to the AIRM (ATM Information Reference Model), which ensures that this exchanged information shares the same meaning at its origin and at its destination (this is called semantic interoperability).

A service description in the ISRM is a platform neutral service design (PNSD), which means that there are no platform/implementation specific details. Different stakeholders may bind their service to the most suitable stack of technical standards (SWIM Technical Infrastructure Profile) for their implementation of the service.

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What are the benefits of the ISRM?

Service Orientation and ISRM in particular enable multiple implementations of services (by different stakeholders) based on the same logical service definition to share common scope, description of functionality, behaviour and semantics. This provides a reference service portfolio that helps to assure logical interoperability of service implementations by different providers, which again makes it easy for service consumers to use various providers for the same service. If necessary, it also allows for evolving the service implementation to new technologies, while maintaining the essential nature of the service, which is also important for backwards compatibility.

The ISRM comes with a set of rules in the form of a foundation rulebook that aims to ensure full compatibility with SESAR's European ATM Architecture (EATMA). These rules not only prescribe the traceability of service payload to the AIRM, but also require context diagrams in order to connect to the EATMA for views on actors, operational processes and states, as developed in SESAR. A service in the ISRM does indeed define functionality, behaviour and interfaces, but also ensures compatibility with SESAR's newly developed concepts through its foundation rulebook and the corresponding compliance criteria. In other words, the ISRM is fully aligned with the European ATM Architecture (EATMA) which is available through the European ATM Portal (www.eatmportal.eu/).

What does the ISRM "look" like?

From a user perspective, the ISRM is presented in Service Portfolio and a set of Service Description Documents:

- **ISRM Service Portfolio:** The ISRM Service Portfolio is a high level summary of all available services in the ISRM. The portfolio also categorises the services so that the reader can find services based on different criteria e.g. alphabetical, related ATM capability, supported operational activity, providing technical system, information domain et**c.**

- **Service Description Documents (SDDs):** Documents containing textual and model descriptions of each service in an easily accessible format. This is what the technical implementation is assessed against when doing SWIM Compliance assessments.

The core of ISRM consists of the following components that are used and created by Service Architects when identifying and designing services:

- **Service Models**: These models are the logical (i.e. technology independent) representation of the ATM-specific services. They are presented as diagrams using a formal UML (Unified Modeling Language) notation according to a number of NAF (NATO Architecture Framework) views in line with EATMA within SESAR.

- **Service Taxonomy:** The hierarchical breakdowns to which the services are allocated.

- **Services Common Model Package:** Libraries of basic model building blocks which can be used by all contributors to the ISRM, thus facilitating basic consistence with all contributions.

Besides the ISRM model itself, there are also supporting documents to be used for maintenance and further development of ISRM.
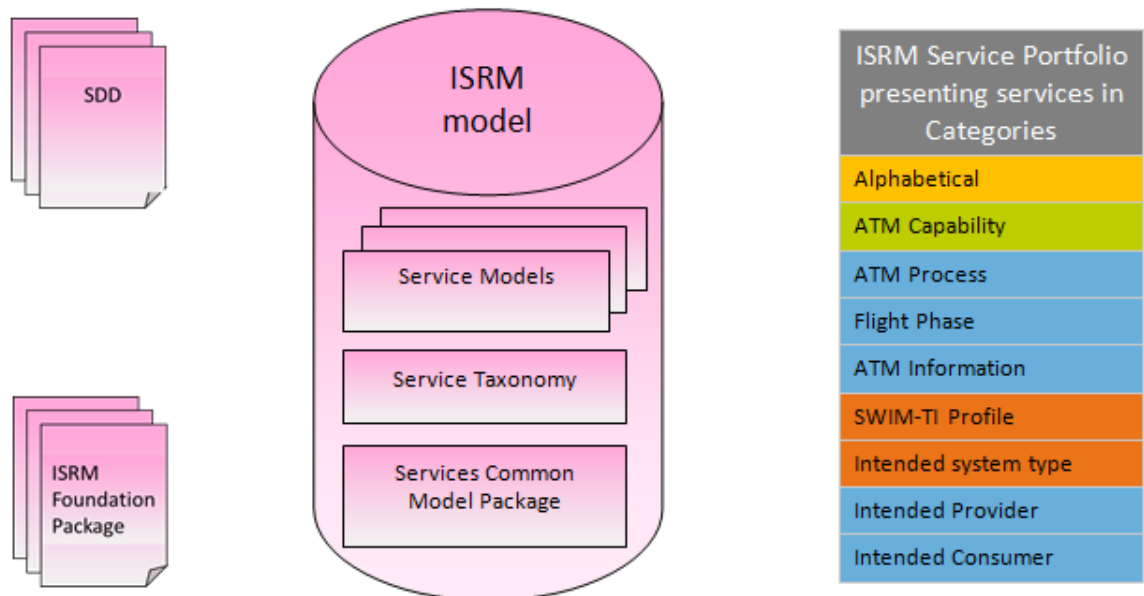

Figure 2: The ISRM Artefacts

- **ISRM Foundation Package:** Provides essential guidance and support for the creation of the ISRM. It includes a primer, rules and guidelines for modelling & verification and how to do model consolidation. The foundation ensures the quality of the service models.

ISRM availability

Intermediate releases of the ISRM, containing an increasing number of service definitions (SDDs) are being produced within the context of the SESAR programme. The final release of the ISRM will be the ISRM 2.0 and expected to be provided in May 2016.

How does the ISRM contribute to SWIM?

SWIM is about connecting the ATM World and sharing information in order to make decision processes between ATM actors more efficient and agile. In this perspective, the ISRM provides the logical description of the services to be implemented by systems and consumed over SWIM Infrastructure. When assessing the SWIM Compliance level (ready, compatible, compliant) of the implemented (physical) services according to the SWIM Compliance Framework the Technical Specification (TS) and the Service Technical Design Description (STDD) are checked against the logical service model as defined in the SDD. This will assure that all implementations of a particular service defined in the ISRM are logically interoperable. Transformations between different technical implementations of the service are then relatively straightforward. The ISRM will help to implement the SWIM-concept and moving from current "one-to-one" data exchanges to a net-centric

information distribution model. Gathering all services in one model and including them in EATMA, linked to other architectural elements, will enable an active service portfolio management ensuring consistency within the EATMA.

How does the ISRM support Operational improvements?

The development of information exchange requirements and the corresponding information exchange services is done in close cooperation and iteratively by operational and service architects together. Once the services are defined and integrated into SWIM enabled applications, the concept of SWIM and services will (to a large extent) be hidden from the operational user. When the right information is available to the right person, at the right time, without too much effort, then we have succeeded. The increased distribution of information to aviation stakeholders enables the further development of new operational concepts that are not feasible with today's system architecture.

How does the ISRM improve interoperability?

By building on shared (common) standards like the AIRM, semantic interoperability is ensured. By binding a logical ISRM service to one of the stacks of technical standards (SWIM TI Profile), technical interoperability is also ensured. By applying all SWIM standards simultaneously, systems become operationally, semantically and technically interoperable.

Conclusion

The service part of the SWIM concept has been developed in SESAR for several years and is maturing. The ISRM today provides around 40 logical reference services in domains such as: flight information, aeronautical information, network information and meteorological information. It is ready to serve as the implementation baseline for the needs of the first deployment steps of SESAR, as defined in the PCP.

The ISRM Foundation has been developed to a level that is stable and mature, and is currently prepared for Post SESAR development of further SWIM services. The ISRM Foundation is also specified as the mandatory framework to follow when defining services for the PCP.

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