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On 'interoperability' and 'seamless' within the context of SWIM

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on behalf of

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- **Doc.9854, Global ATM Operational Concept**
 - Information management will achieve a seamless transfer of relevant information...
 - ICAO is the only international organization in a position to effectively coordinate global ATM implementation activities leading to the realization of a seamless global ATM system.
- **Doc.10039, Manual on SWIM Concept**
 - SWIM consists of standards, infrastructure and governance enabling the management of ATM information and its exchange between qualified parties via interoperable services.



- **Doc.9882, Manual on ATM System Requirements**
 - The requirements of seamlessness and interoperability dictate that systems — whether proprietary or not — conform to openly available standards regarding the format and character of transmitted or transferred information. It is intended that there will be development of fully interoperable information systems capable of seamless information transfer throughout the ATM system.
 - To meet the expectations for the ATM system regarding information services, the ATM shall:
 - **support a reduction in transactional friction for transmission of information across systems.**

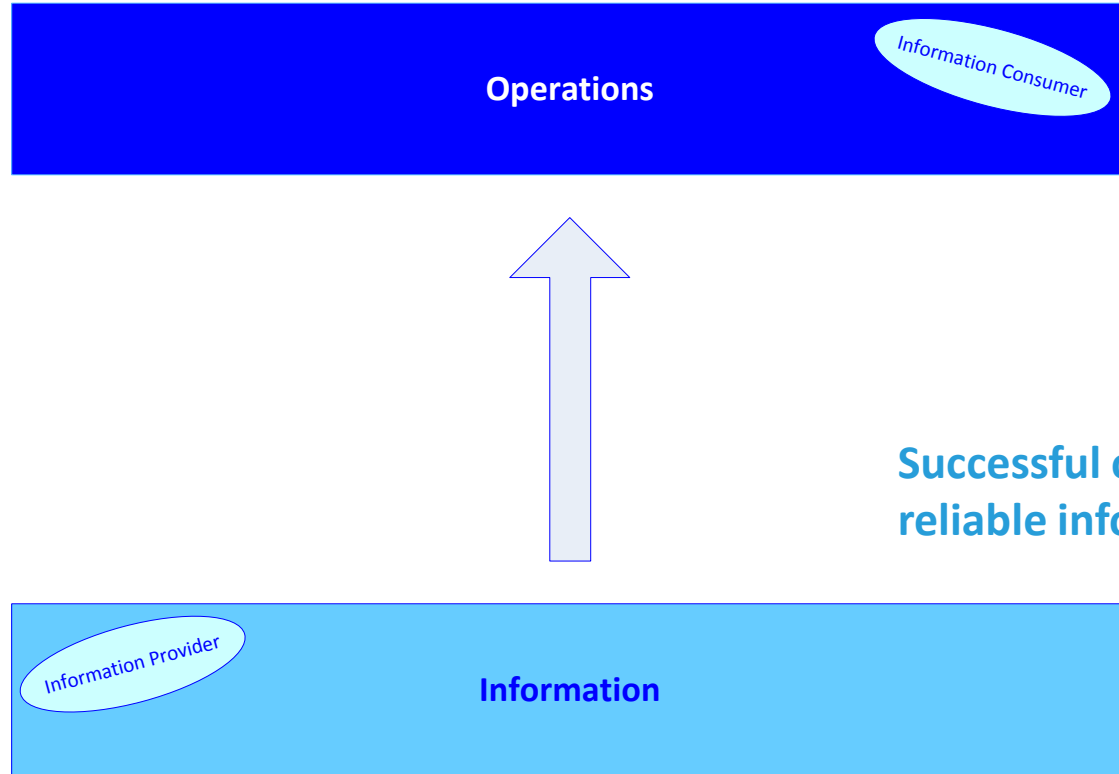


- ATMCP-WG/WHL/10-WP/257, **The Use of the Terms “Interoperability” and “Seamlessness”**, 03/02/2006
 - **Interoperability** within the ATM system is the ability to transfer information or effect functionality across any discontinuity, in order to enable operations.
 - **Seamless** within the ATM system is the property that allows a transition across any discontinuity, which from the perspective of the transiting agent does not require a considered action to facilitate the transition.

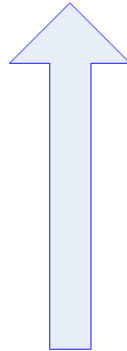


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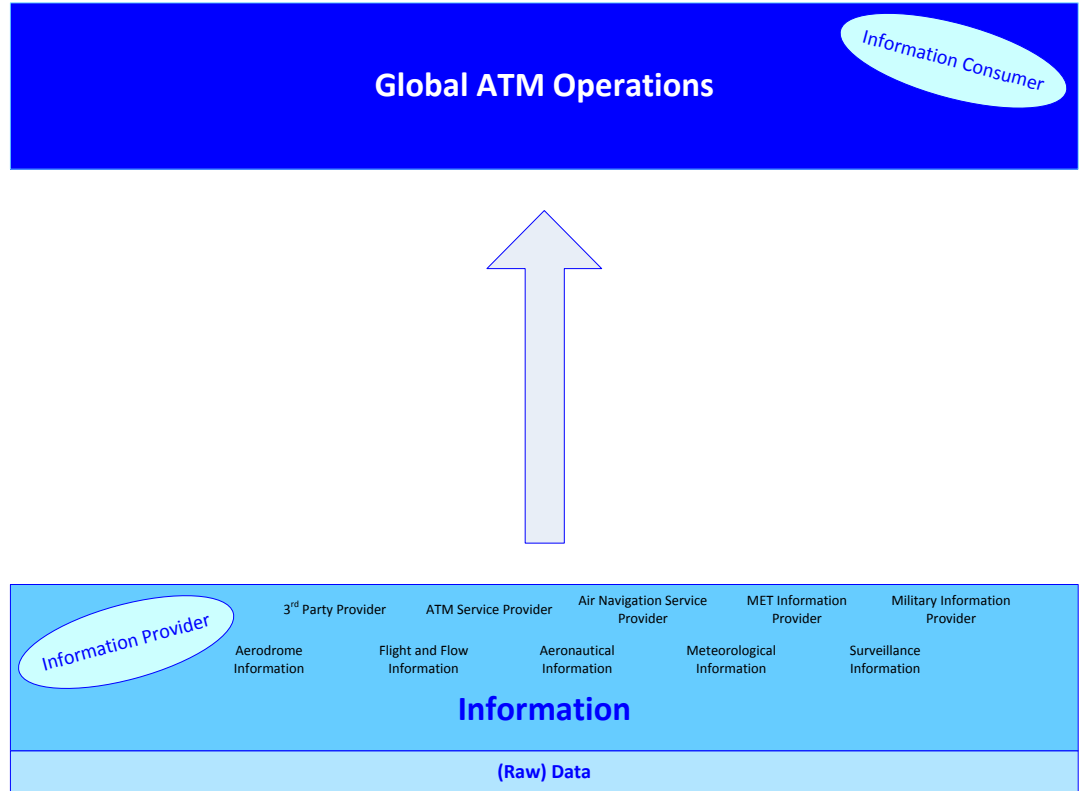
Successful operations require reliable information.



The information in the Global ATM operations environment

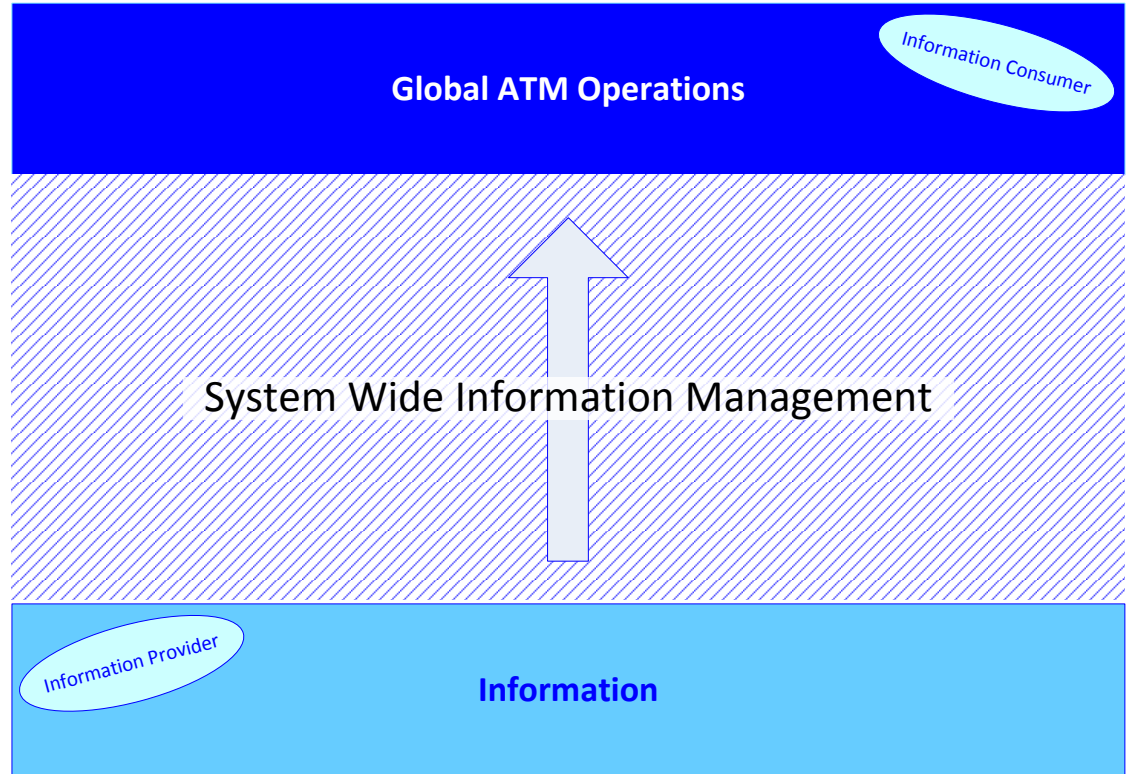


Information relevant to global ATM operations



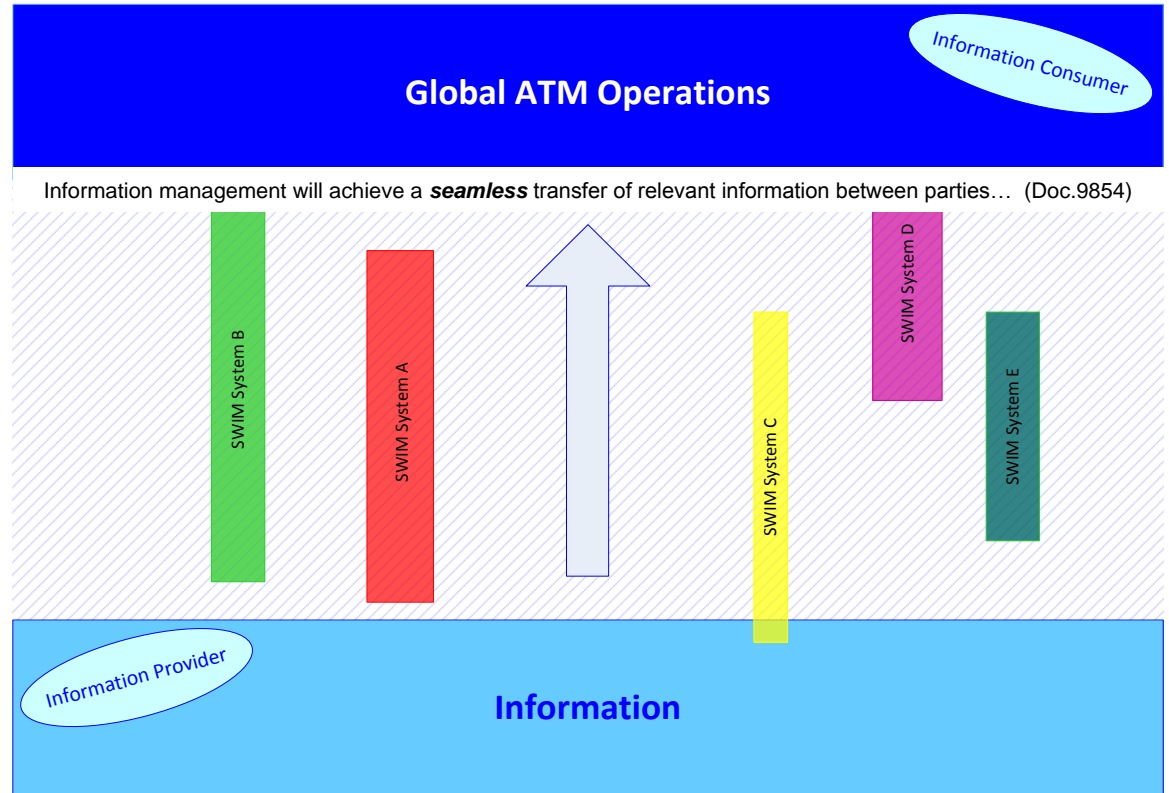


System Wide Information Management to provide the information in support of global ATM operations



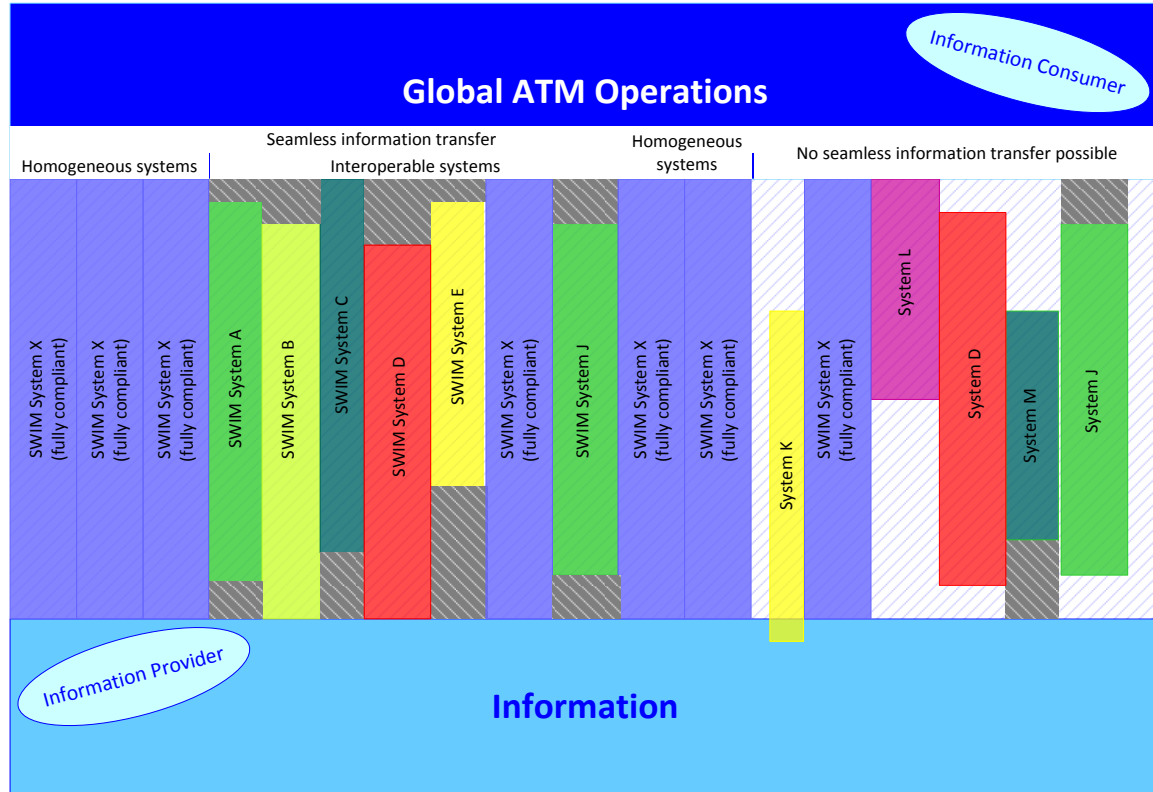


Currently, the problem is the existences of various initiatives around the world began developing SWIM systems based on their respective and particular national or regional requirements





Fulfilling the promise of SWIM enabling seamless information transfer.





On the notion of “interoperability”

- The question is:
- So, how to achieve interoperability?
- Simply put, interoperability means for heterogeneous systems to inter operate, that is, to work together.



An analogy to illustrate interoperability and seamless

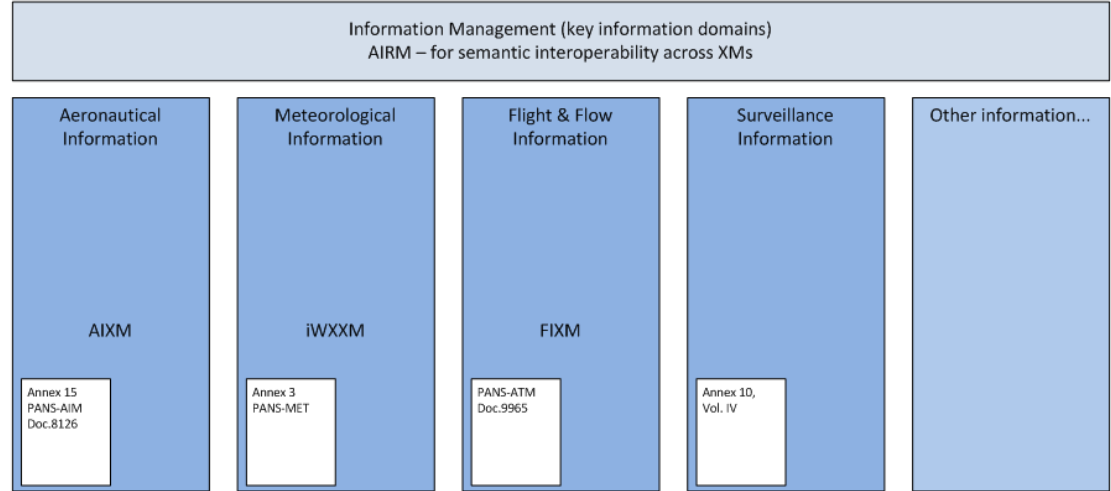
- Electrical system in different States:
- System A: 230 Volts
- System B : 110 Volts
- The frequent world traveller, always, carries an adapter to use his/her electrical equipment.
- “Interoperability” means having to change to a different plug configuration and/or converter.
- No external adapter is needed for seamlessness.



Defining a standard SWIM Solution?

Standard Information
eXchange Models

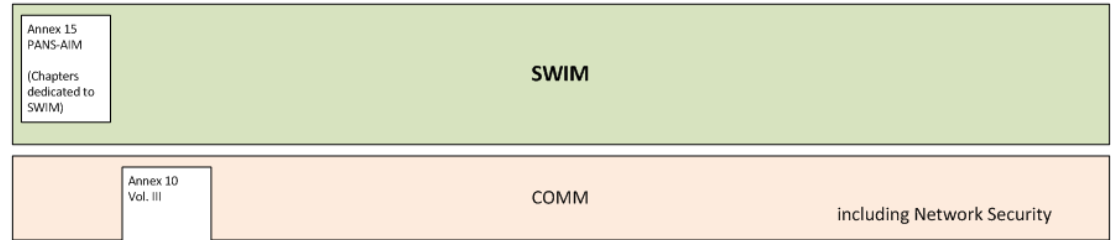
Information



Technical Infrastructure

Information Services

Technical Infrastructure





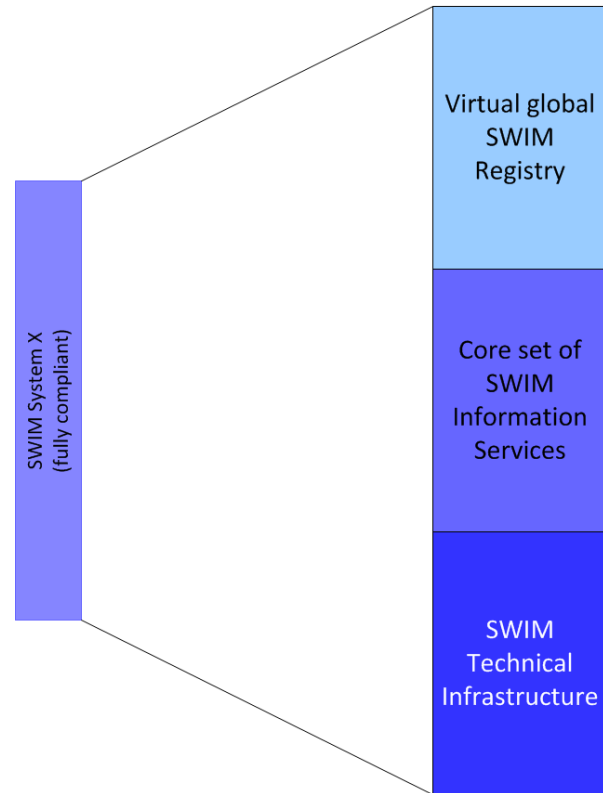
Defining a standard SWIM Solution?

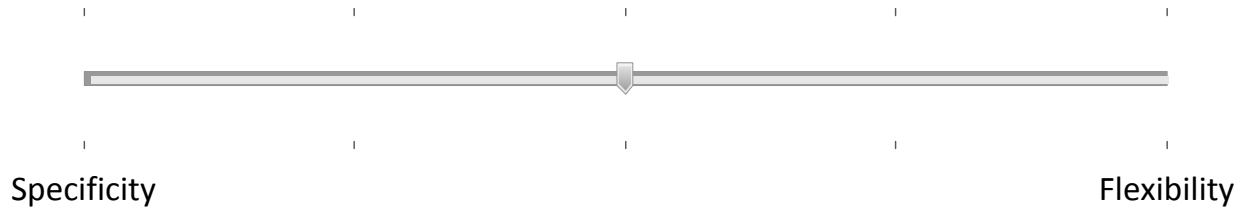
Fully compliant Standard SWIM Solution should probably be made up of three key elements, namely:

- **A standardized SWIM technical infrastructure,**
- **SWIM information services,**
- **SWIM registry to permit discoverability of the SWIM information services that are being provided.**



The standard SWIM Solution decomposed into its three key elements, SWIM Technical Infrastructure, SWIM Information Services and SWIM Registry.





Global SWIM implementation:

Combining Uniformity with (interoperable) Variability to enable seamless information exchange in support of ATM operations.



Summary

- Interoperability and Seamlessness are key notions of the GATMOC
- Definitions for Interoperability and Seamless (WP/257) are still valid
- Discontinuities in the global system introduce transactional friction
- Interoperability always comes at a price
- To deliver on promise of seamless, global SWIM should act as “single system”
- Seamlessness requires uniformity
- Uniformity is not singleness
- Need to define a standard(ized) SWIM solution; key SWIM components
 - SWIM technical infrastructure,
 - Basic set of SWIM information services, and
 - SWIM registry
- Specificity versus Flexibility
- Objective of interoperability is to eliminate or, at least, minimize transactional friction
- Premise that uniformity leads to flexibility is counterintuitive



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THANK YOU