

"Get into SWIM" session

Identify services for A-CDM

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Approach for today





Starting point



Assumption: You have a problem statement

- in relation to info exchanges & collaboration
- you know what issue needs a solution
- you know the trigger to your project
- you know why using services

Assumption: You've decided to go for SWIM

- in a given context
- with a defined scope
- with defined goals

Assumption:

- going top-down
- following a Service Orientation Process



Identify

service identification is the set of activities involved in documenting the operational context of the service in relation to the business need, information exchange requirements (IER), non-functional requirements (NFR), and operational scope.

- Description of operational environment
- Determination of operational process leading to the identification of information exchanges assigned to information service(s)
- Determination of IER and NFR
- Investigation of reuse of services
- Characterization of the identified information service in terms of functionality

- Documentation of operational processes and information flows
- Identification of one or more information service(s), with determination of operational context (scope), requirements, and functionality
- Service identification information (name, abstract, operational context, IERs, NFRs and functionality)



Process Step – Identify services

service identification is the set of activities involved in documenting the operational context of the service in relation to the business need, information exchange requirements (IER), non-functional requirements (NFR), and operational scope.

- The analysis results in the determination of a set of services that cover the information exchange requirements.
 - Service identification may lead to several services.
- Concerns worth managing:
 - Quality of IERs
 - Level of technical formalism
 - Scope management
- This step is different from the other process steps as the number of services and their boundaries have not been defined yet.

Main outcome = Service Identification Document (SID)

A single document covering the whole Identification step. It provides the scope, the context, and an initial description of services identified, allowing start on subsequent process steps such as Design or Implement.





Process step: Identify services A-CDM example

- Goal
 - identify standardised information services that cover A-CDM as defined in the A-CDM Implementation Manual.
- Scope
 - focused on information exchanges for Common Situation Awareness, Flight Alerts, and key timing events.
- Out of scope:
 - exchanges with Network Operations
 - exchanges with Aircraft Pilot



Activity: Describe Operational Environment

Activity

Description of an operational environment in which service orientation is envisaged

- The description includes the main concepts and key principles of the operational environment.
- Concerns worth managing:
 - references to multiple concept documents, such as ConOps, OSED, ICAO docs, etc



		Organisational	Information	Technical	
	Context.		\Rightarrow		
	Concept.				
	Logical				
	Physical				

SWIM-SERV-011 Operational needs

Activity: Describe Operational Environment A-CDM example



A-CDM Implementation Manual,

 with the notions of Common Situational Awareness (CSA), the Airport CDM Information Sharing Platform (ACISP), milestones, predictability



enter your presentation title

Airport Transit = the transit of an aircraft at an airport.

= inbound flight + turn-around + outbound flight



Activity: Operational process and info exchanges

Activity

Determination of operational process (e.g. business process analysis using business process models (BPM)) leading to the identification of information exchanges assigned to information service(s)

- Identification of the involved stakeholders, business processes, and information exchanges.
- BPM: Stakeholders are represented in swim lanes and information flows between lanes become candidate information exchanges. In turn these may be assigned to information services.
- Concerns worth managing:
 - Scope of the analysis (breadth)
 - List all stakeholders involved including role.
 - Information needs and common understanding (AIRM)
 - Use of a business architecture
- Promote use of standards such as BPMN.
- Availability of expertise. Tip: ensure that service and information architects are available





SWIM-SERV-011 Operational needs



Activity: Operational process and information exchanges A-CDM example

- Stakeholders
 - A-CDM concept identifies the stakeholders as A-CDM partners.
- Operational language
 - The operational terms
- Information needs
 - Information needs and provision by A-CDM partners
- BPM
 - Business Process Model for the various Milestones



Activity: Operational process and information exchanges A-CDM example

Stakeholders

The A-CDM concept identifies the stakeholders as A-CDM partners.

Information exchanges take place between A-CDM partners

Airport CDM Partner

An Airport CDM Partner is a stakeholder of a CDM Airport, who participates in the CDM process. The main Airport CDM Partners are:

- Airport Operator
- Aircraft Operators
- Ground Handlers
- De-icing companies
- Air Navigation Service Provider (ATC)
- Network Operations
- Support services (Police, Customs and Immigration etc)
- One essential party is the Airport CDM Information Sharing Platform (ACISP).
 - Essential for Common Situational Awareness (CSA) concept
- It has further evolved in the concept of Airport Operations Plan (AOP)



A-CDM example **Operational language**

Overview of **operational terms** of A-CDM, organised

- per event (eg OffBlock),
- per event group (eg Departure), or
- per physical element (eg Aircraft)

This information is subject to be exchanged.



Using AIRM for operational language

ntation title



OffBlockReady ARDT TOBT

Good SWIM practice



use AIRM. Re-use the good work put inside the ATM Information Reference Model.



Activity: Operational process and information exchanges A-CDM example_____

Operational view on information needs and provision by A-CDM partners

Stakeholder	Information needs	Information provision	
Aircraft Operations Updated Airport CDM situational information such as planned, estimated and actual landing, in-blocks, TSAT and take-off times		Flight Plan and other data related to the flight, planned, estimated and actual times related to progress of turn-around such as TOBT	
Airport Operations	Updated Airport CDM situational information such as planned, estimated and actual landing, in-blocks, TOBT, TSAT off-block and take-off times	Airport Schedule information, Airport resources allocation	
Ground Handling	Updated Airport CDM situational information such as planned, estimated and actual landing, in-blocks, TSAT and take-off times	Flight Plan and other data related to the flight, planned, estimated and actual times related to progress of turn-around such as TOBT	
De-icing Operations	Updated information about aircraft requesting de-icing and the estimated "ready for de-icing" time and TSAT	Status, estimated and actual times of De-icing for the particular aircraft.	
ATC	Updated Airport CDM situational information such as in-blocks and off-blocks times and stand	Updated planned, estimated and actual landing, TSAT and take-off times Note: The TSAT may be calculated by a sequencing tool.	
ATFCM	Departure Planning Information (DPIs) Depending on local/national implementation, information to and from the CFMU may pass	Flight Plan Data, Calculated Take-off Times (Departure slots), Flight Update Messages (FUM) and error messages	

Activity: Operational A-CDM example

BPM

Business Process Model (BPM) for Milestone 07 – Aircraft arrives in block

BPM makes clear which info is exchanged between whom, when and for what purposes



Activity: Determine IERs and NFRs

Activity

Determination of information exchange requirements (IER) and nonfunctional requirements (NFR) related to information service(s)

- The activity involves the selection and formalising of information exchanges as IER and NFR
- Concerns worth managing:
 - Scope of the IERs (focus)
- Mode details







<u>SWIM-SERV-011 Operational needs</u> (IERs) <u>SWIM-SERV-014 Quality of service</u> (NFRs)

SESAR

Activity: re-use services

Activity

Investigation of existing information service(s) for possible re-use, as-is or with some modification

- The activity involves researching service portfolios
 - registry, enterprise architecture, communities, ...
- Note: taxonomy and service categorisation may be of use

Benefit

Reuse. Making use of the work of others means potential big savings and increased interoperability.





SWIM-SERV-009 Service categories

EUROCONTROL

Activity: re-use service(s) A-CDM example

- In 2013, the search did not find any service.
- However we found another community in charge of a similar Identification.
- So we joined forces, as a joint ACI ACRIS + SESAR SWIM team



Activity: Scope and characterise the services

Activity

Characterisation of the identified information service in terms of functionality

The activity involves the grouping and assignment of information exchanges (requirements) to individual services. These services are named and characterised.
Resources

- Concerns worth managing:
 - loose-coupling principle
 - pattern architecture for services
 - business and IT alignment
 - prioritisation of services



Identify				
	Operational environment			
	Oper. pr	r. process, info. exchanges		
	IER and NFR			
	Reuse services			
	Scope &	Scope & characterize services		
Design				
Implement				
Deploy				



SWIM-SERV-006 Service identification SWIM-SERV-007 Service abstract SWIM-SERV-012 Service functionality

Scoping service

SWIM Principle

loose coupling. A characteristic of software systems, in which dependencies among a system's constituting parts have been intentionally reduced.

- Loose Coupling: Where each of its components has, or makes use of, as little knowledge as possible of the definitions of other distinct components.
- Scoping is mainly about assigning a set of IERs to a service.
 - you can go for atomic services: each IER is assigned to one service
 - or group based on identified commonalities (eg same provider, or same consumer, or same info, or same activity, or same timing, or same pattern)
 - check for and avoid dependencies

- This is where a service architect can make a difference.
- This is rather an "art".



re-use. Easier to re-use in other contexts.





Activity: Scope and characterise the services

A-CDM example

Approach made simple

- List all IERs (and their related NFRs) in scope
- Find commonalities (eg NFRs, Provider, Consumer, or exchanged info)
- Group according to criteria
- Services are appearing





Activity: Scope and characterise the services A-CDM example

Service architecting resulted in a series of services

- with name, scope,
- intended provider
- intended consumers
- with IERs, NFRs, exchanged info, function
- with information flow
- loose-coupling
- with priority

Many IERs did not lead to services

project scope management



Outcomes



Outcome



operational processes and information flows global to the set of identified services

Outcome

Service identification information

overview of <u>each</u> identified service (name, abstract, operational context, IERs, NFRs and functionality) Input for next steps Reusable in a future Service Description.



SWIM-SERV-006 Service identification SWIM-SERV-007 Service abstract SWIM-SERV-009 Service categories SWIM-SERV-011 Operational needs SWIM-SERV-012 Service functionality SWIM-SERV-014 Quality of service

Outcome



Service Identification Document (SID)

A single document covering the whole Identification step.

EUROCONTROL

Outcomes A-CDM example

A-CDM Service Identification Document (SID)

- Structure of doc based on the Interoperability Architecture.
- Will be having a closer look at in SSCONE meeting.

(candidate) Resources

	Organisational	Information	Technical
Context	Interoperability Context Reference Documents	Raw Operational terms The Airport transit View	SWIM Standards Service Portfolio Building Blocks
Concep	Stakeholders & Roles Business Process Models (BPM)	Modelled Operational terms Information Elements related to C	
a Logical	Stakeholder needs and provision of information Overview of Information Exchanges Generic view on the exchanges Information Exchange Requirements (IER) Dependency Map Pattern Service Architecture: Function and Ser eSimplified view of the pattern architecture Identified Services Visual overview of identified services Identified Services mapped to the Service Arch Service Overviews	Exchanged Information	Service Pattern Architecture
Physic			

Service Identification Document Using the example doc: Identification of A-CDM Services

Experts involved



- Experts involved: operational expert, service architect, information architect
- Teamwork is paramount. Involve the necessary experts, including service consumers.
- Concerns worth managing
 - team building (SmallWritingTeam, BalancedTeam)
 - workshops (larger ParticipatingAudience)



Experts involved A-CDM example

• Interoperability has been addressed by teamwork, by joining forces, and by the variety of expertise and of airports covered.

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SWIM-SERV-006 Service identification SWIM-SERV-007 Service abstract SWIM-SERV-009 Service categories SWIM-SERV-011 Operational needs SWIM-SERV-012 Service functionality SWIM-SERV-014 Quality of service

Outcome



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