SAVOIR

space avionics open interface architecture

Introduction and Status of SAVOIR

On behalf of the SAVOIR Advisory Group
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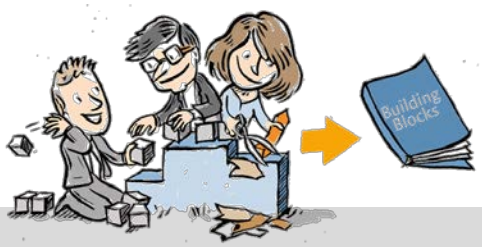
Head of Software Systems Division



What is this all about.

- Improve the way we deliver space systems.
- Support industrial competitiveness.
- Enhance product orientation.

SAVOIR.

SAVOIR means ***S****pace* ***A****vionics* ***O****pen* ***I****nterface a****R****chitecture*.

It is an initiative to federate the space avionics community and to work together in order to improve the way that the European Space community builds avionics subsystems.

SAVOIR is coordinated by the Savoir Advisory Group including representative of ESA, CNES, DLR, Astrium, Thales, OHB, RUAG, Selex Galileo, Terma.

Motivation for the SAVOIR initiative

Improve the way we deliver Space Systems (cost & schedule) by

- **Pre-developed Products / Building Blocks based on**
  - **well defined Specification & Interfaces based on**
    - **an agreed Reference Architecture**

SAVOIR objectives

- to reduce the **schedule** and **risk** and thus cost of the avionics procurement and development, while preparing for the future,
- to improve **competitiveness** of avionics suppliers,
- to influence **standardization** processes by standardizing at the right level in order to get equipment interchangeability (the topology remains specific to a project).
- to define the **governance** model to be used for the products, generic specifications, interface definition of the elements being produced under the SAVOIR initiative.

The process is intended to be applied as part of the Agencies ITTs, and throughout the subsequent procurements and development process. A particular goal is to have SAVOIR outputs exploited in future projects and relevant products as part of European supplier's portfolios.

SAVOIR Output

The primary outputs of Savoir are:

- **reference avionics architecture** for spacecraft platform hardware and software,
- a set of avionics external and internal **interface specifications**,
- the definition of building blocks composing the architecture,
- the **functional specification** of selected building blocks comprising the architecture,
- the implementation of selected **building blocks** at the right TRL level,

SAVOIR expected benefits

SAVOIR supports:

- space avionics **customers** and **system architects**,
- **system integrators**,
- avionics and technology **suppliers**,
- standardization bodies.

It is a tool for the industrial policy and R&D planning makers.

The expected benefits of SAVOIR are:

- for **customers**, streamline the procurement process of spacecraft avionics,
- for **system integrators**, facilitate the procurement and integration of the spacecraft avionics,
- for **suppliers**, prepare the technical conditions for an efficient product line organization.

Organisation

SAVOIR space avionics open interface architecture **Advisory Group**

SAVOIR FAIRE	SAVOIR IMA	SAVOIR SAIF	SAVOIR SAFI
Software reference architecture	TSP based Software reference architecture	Electrical interface (Data & Power) Finalised.	Sensor/Actuator Functional Interface

SAVOIR perimeter

- SAVOIR focus on the Platform Avionics including Payload Interfacing
- Build on the pillars
  - Data Handling Hardware
  - Control Sensors & Actuators
  - On-board Communication
  - Flight Software
- Related topics
  - The operations view

The SAVOIR wheel

Domain of reuse

Agree on which functions compose the perimeter of avionics and how to allocate them to BB if needed.

Domain design

Agree on the most important BB to standardize and develop. Propose a roadmap to implement them.

System Reference Architecture 1

Define Interface (IRD)

Product Use Assesment 4

Building Blocks 2

Refine Interface (ICD)

Reference Functional Specifications 3

SAVOIR is an initiative to federate the space avionics community to work together in order to:

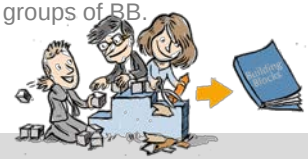
- Improve the way to deliver space programs (cost & efficiency).
- Set a « product philosophy » approach.
- Deliver elements usable by the customers, the system integrators and the suppliers.

Key Performance Indicators

Measure the effectiveness of SAVOIR recommendations and approach, in terms of costs and effectiveness.

Reusable spec & I/F standards

Agree on variability and modularity of the specifications for the selected BB or for groups of BB.

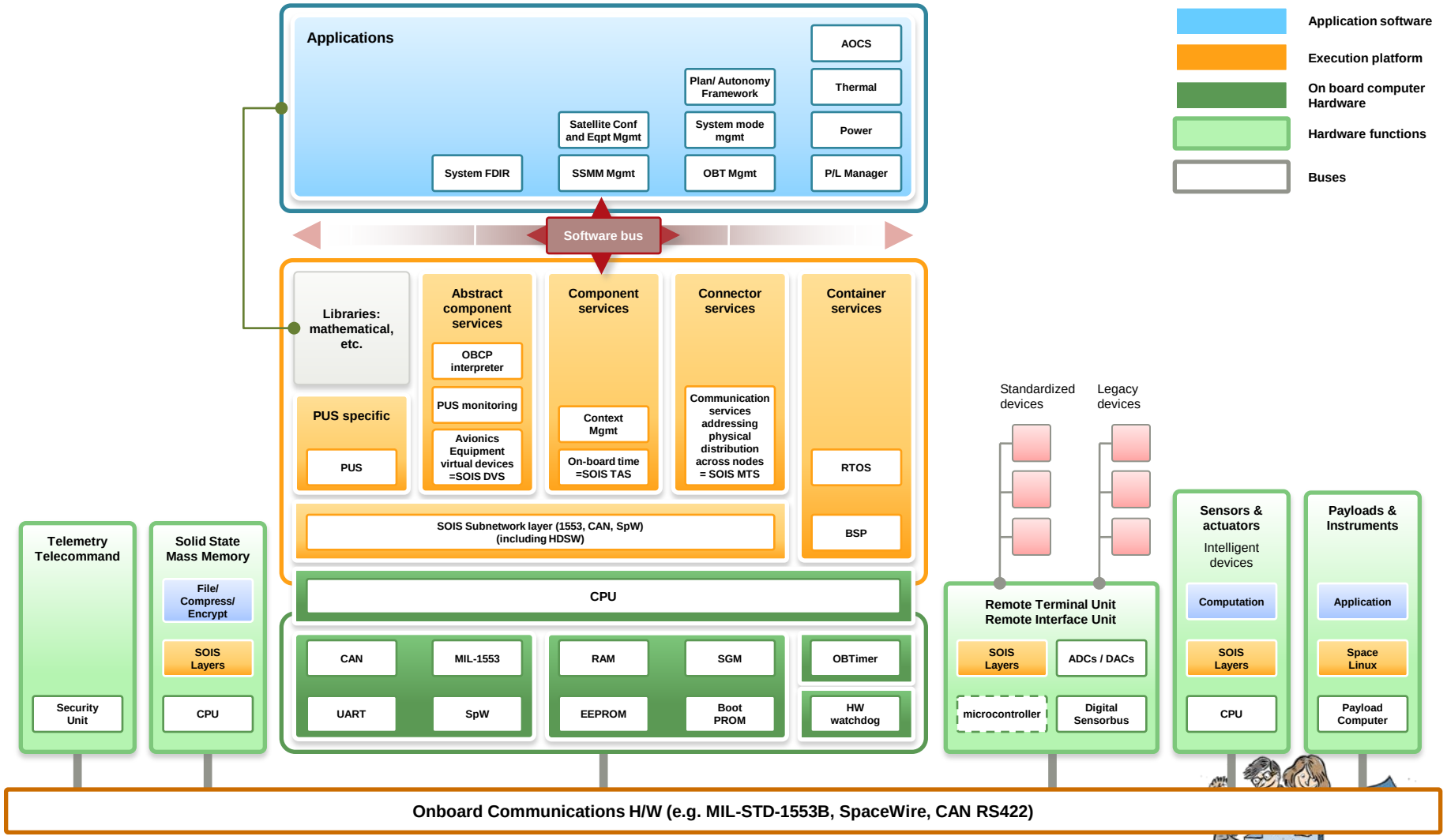


SAVOIR process

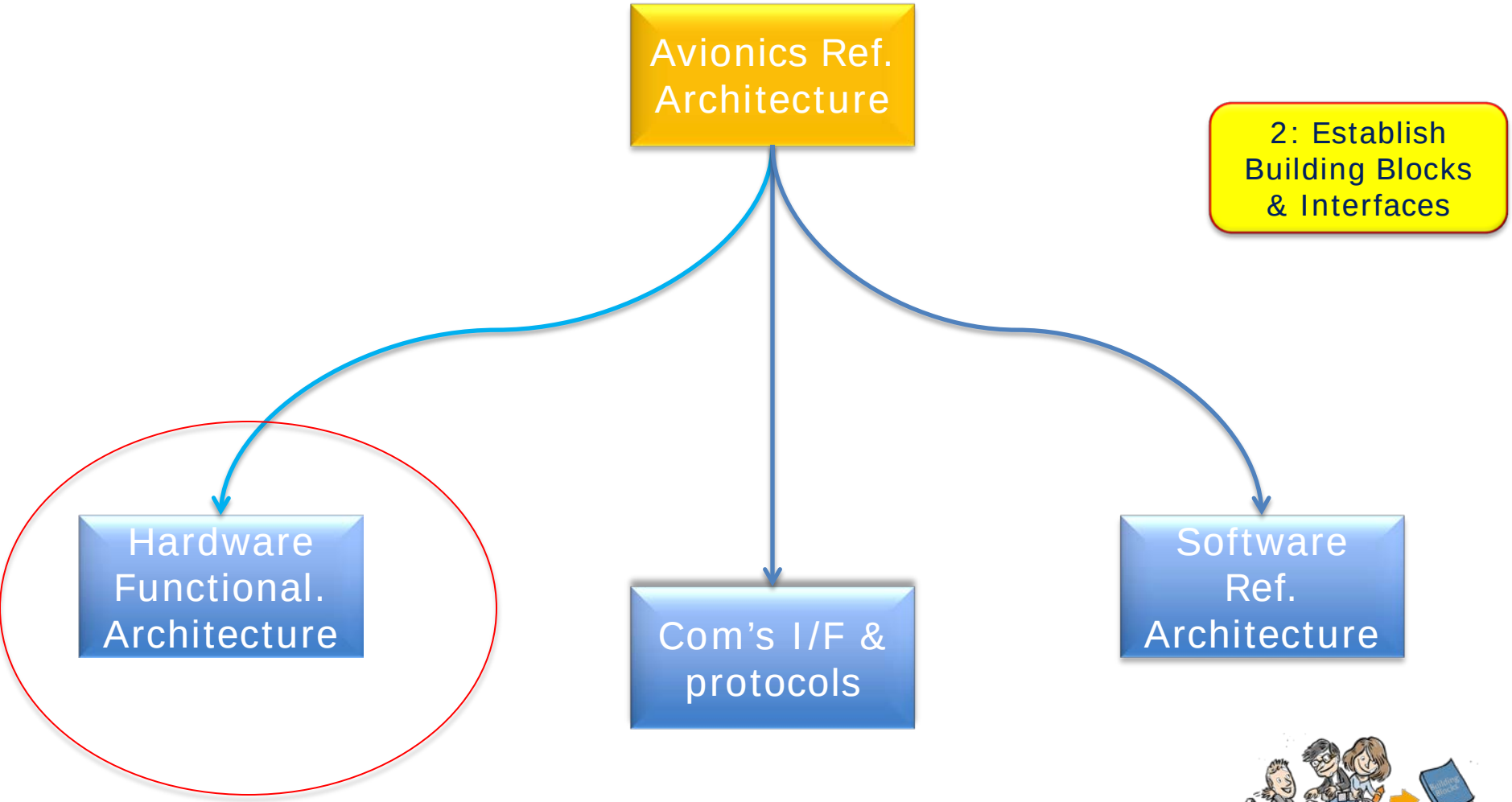
1: Establish Ref architecture.

Avionics Ref. Architecture

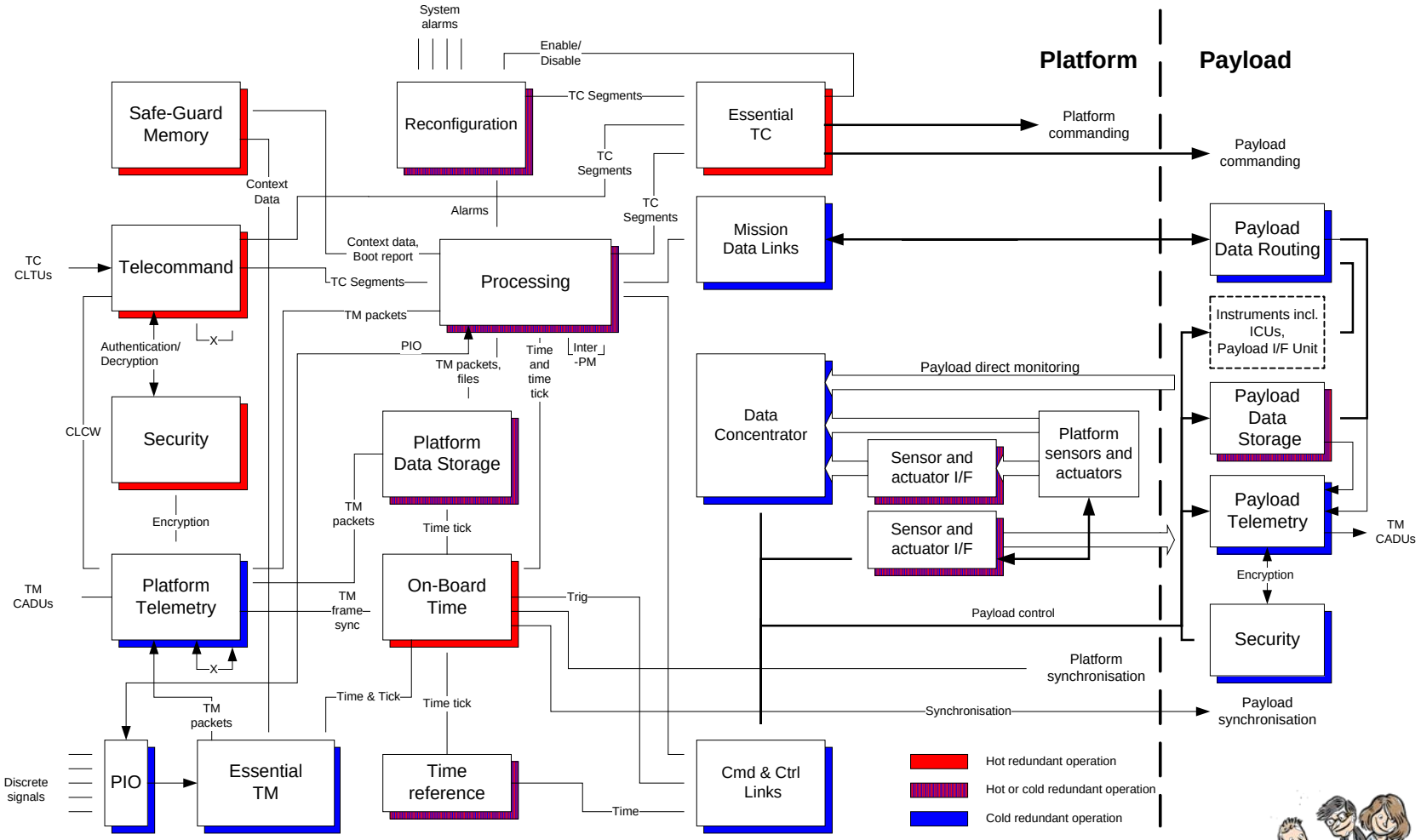
The Avionics Reference Architecture



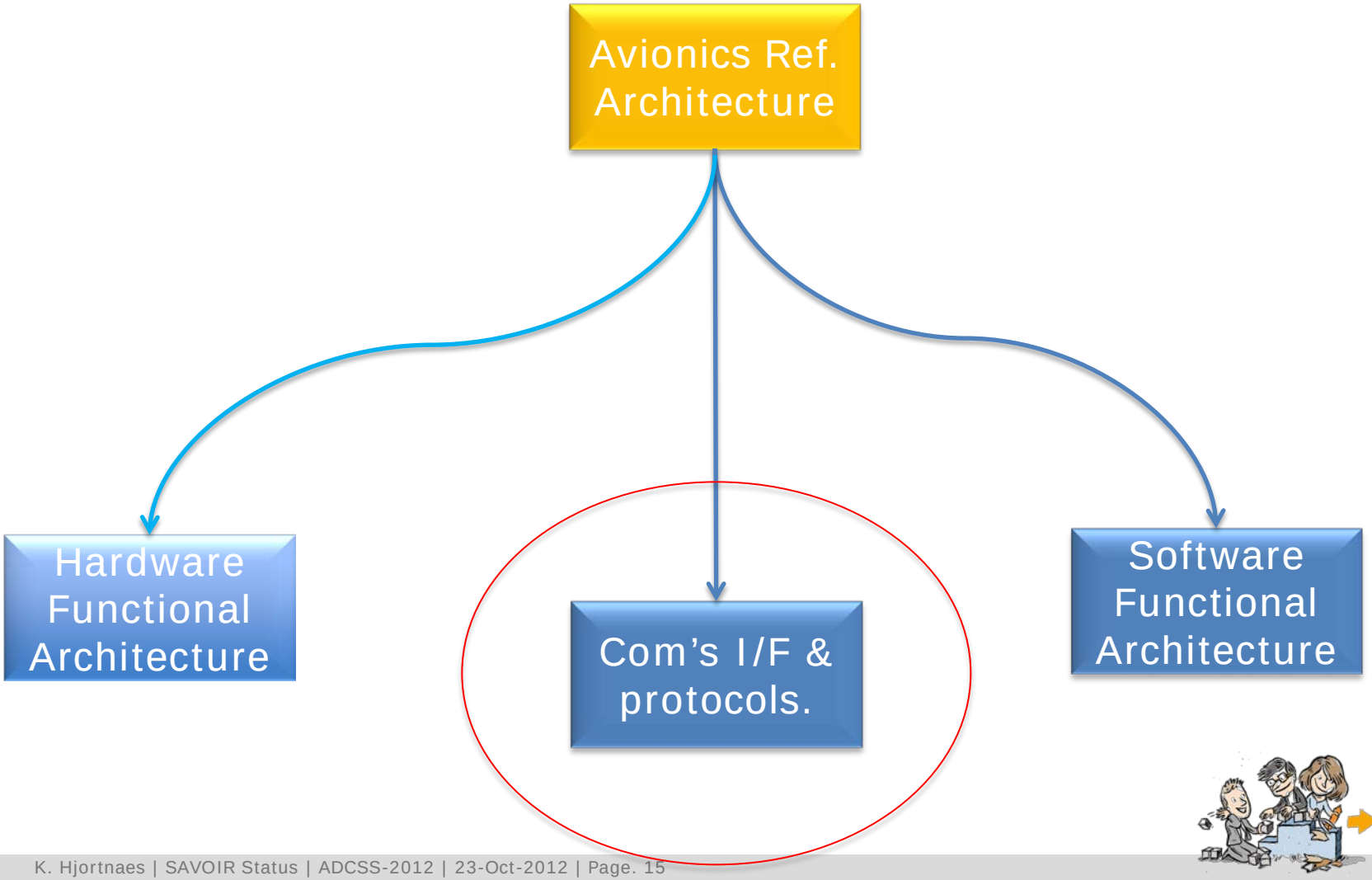
SAVOIR process



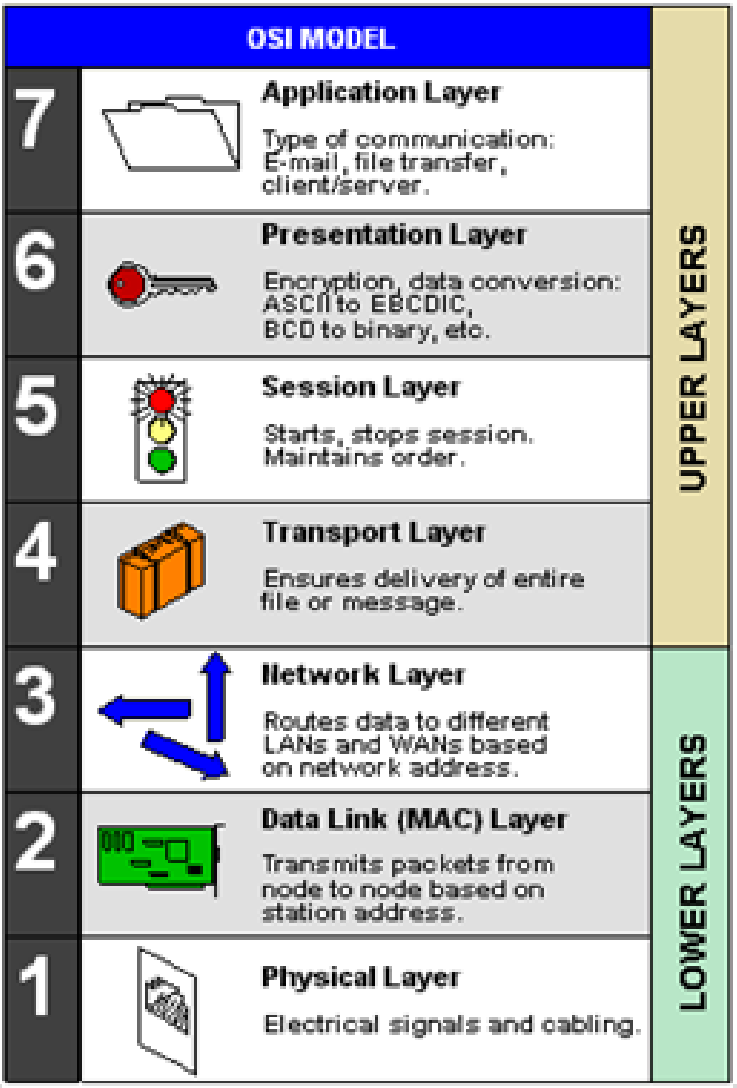
SAVOIR HW Reference Architecture Functional View.



SAVOIR process

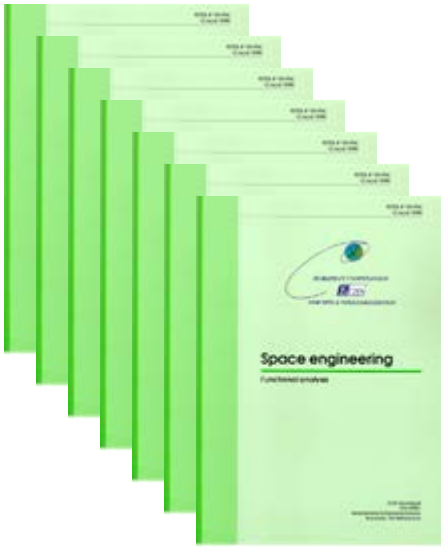


Communication Network & Protocols

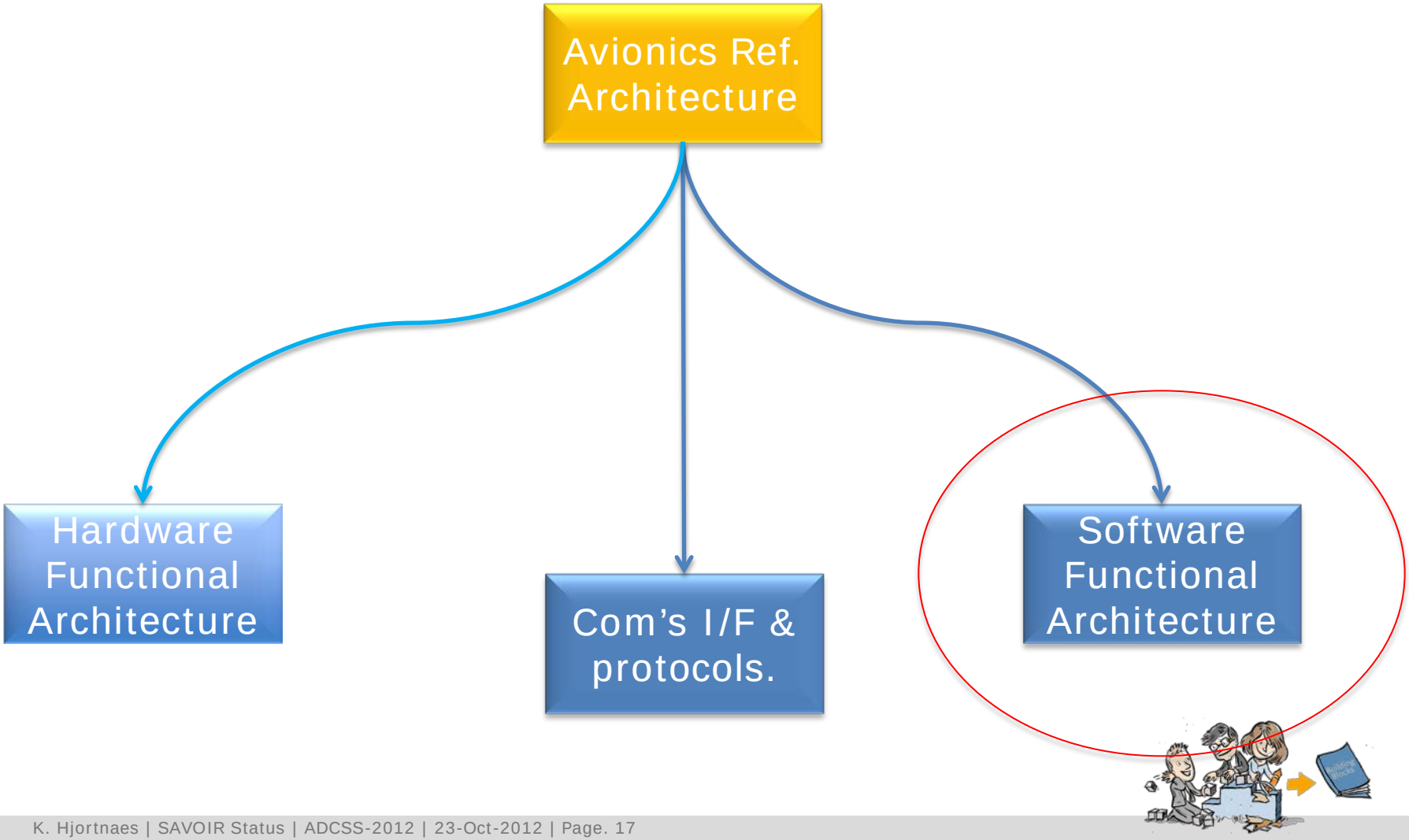


CCSDS
The Consultative Committee for Space Data Systems

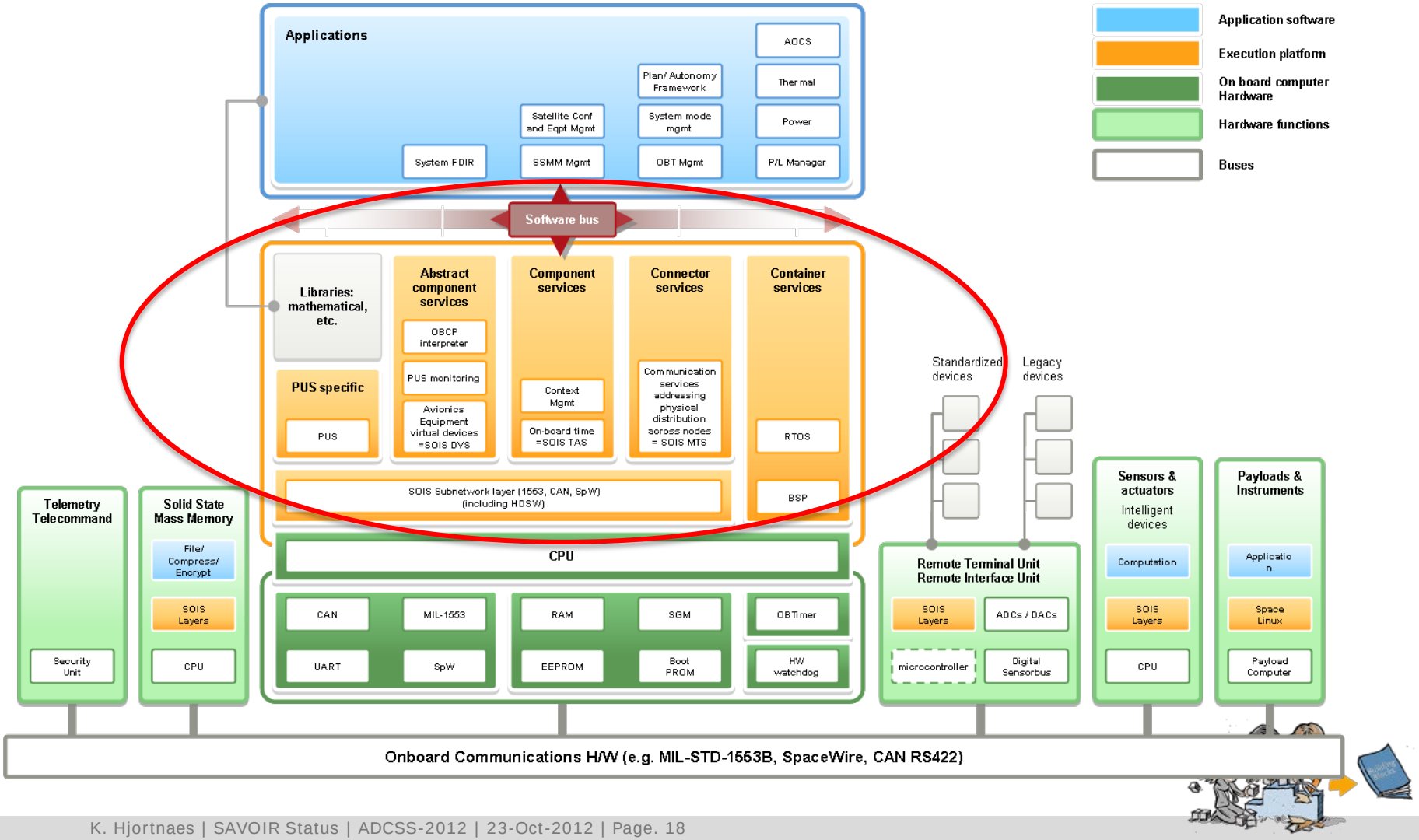
EUROPEAN COOPERATION
ECSS
FOR SPACE STANDARDIZATION



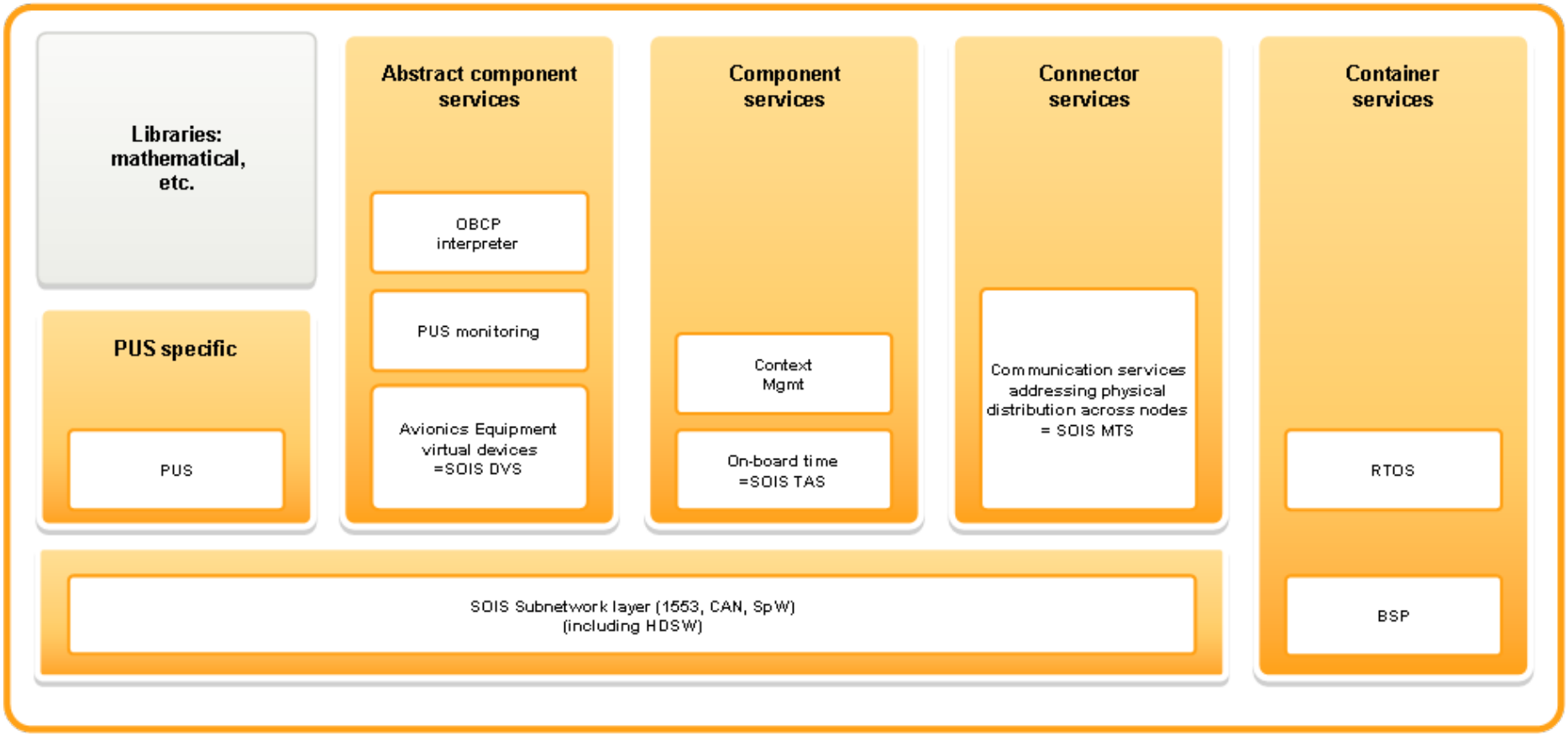
SAVOIR process



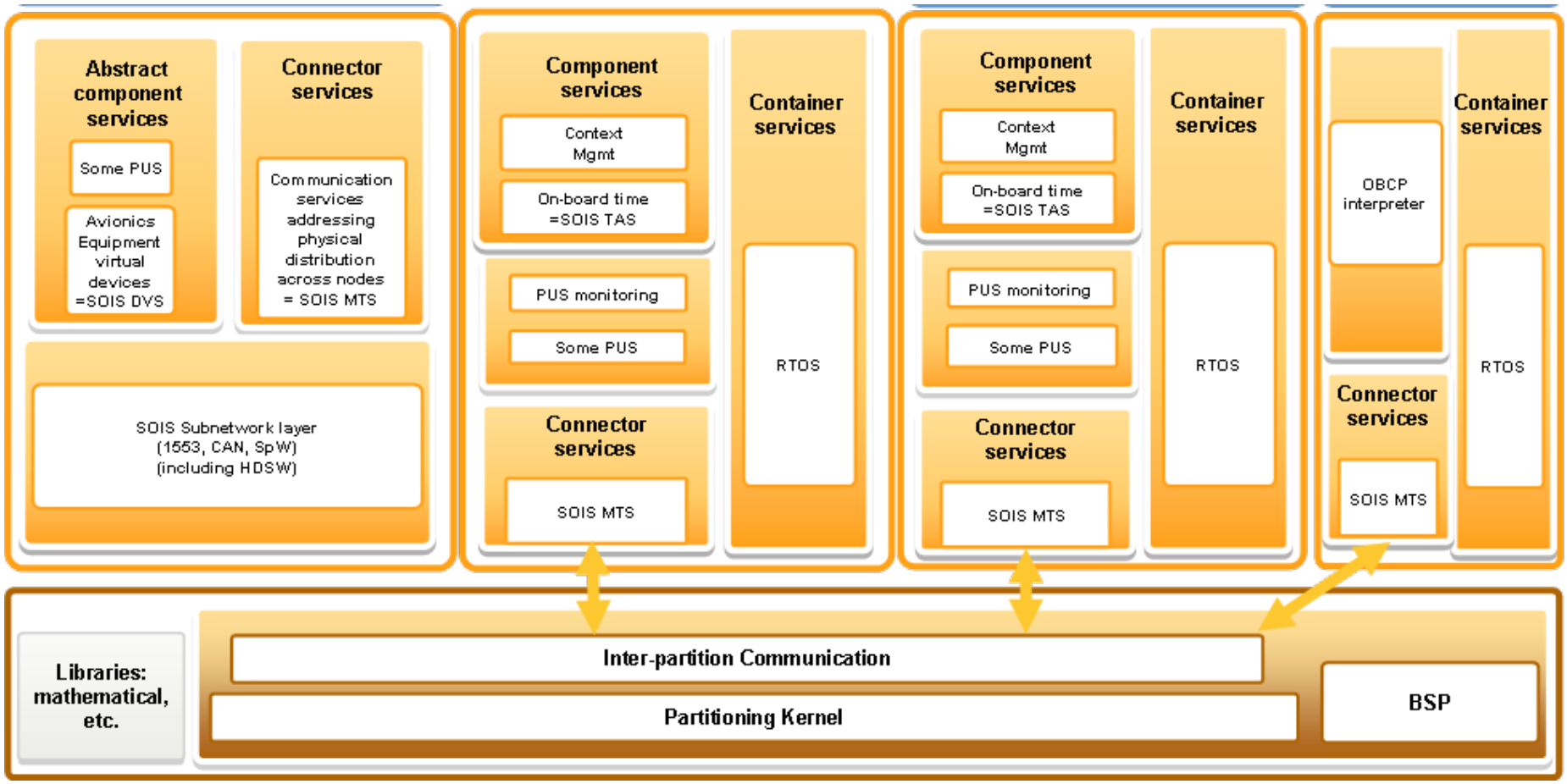
Software Reference Architecture



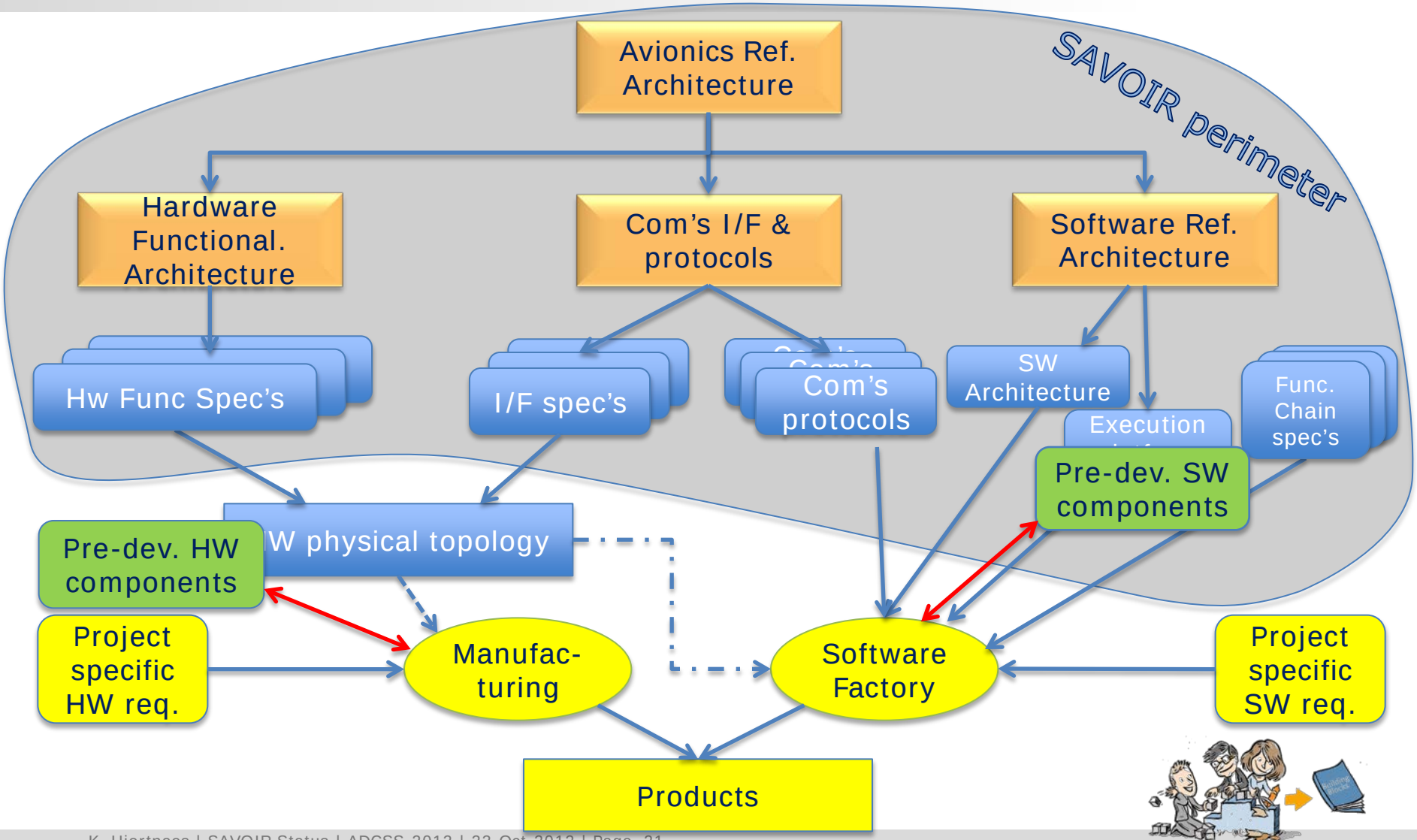
Software Reference Architecture
Execution platform – 'Classic'



Software Reference Architecture
Execution Platform – 'Time & Space Partitioning'



SAVOIR process



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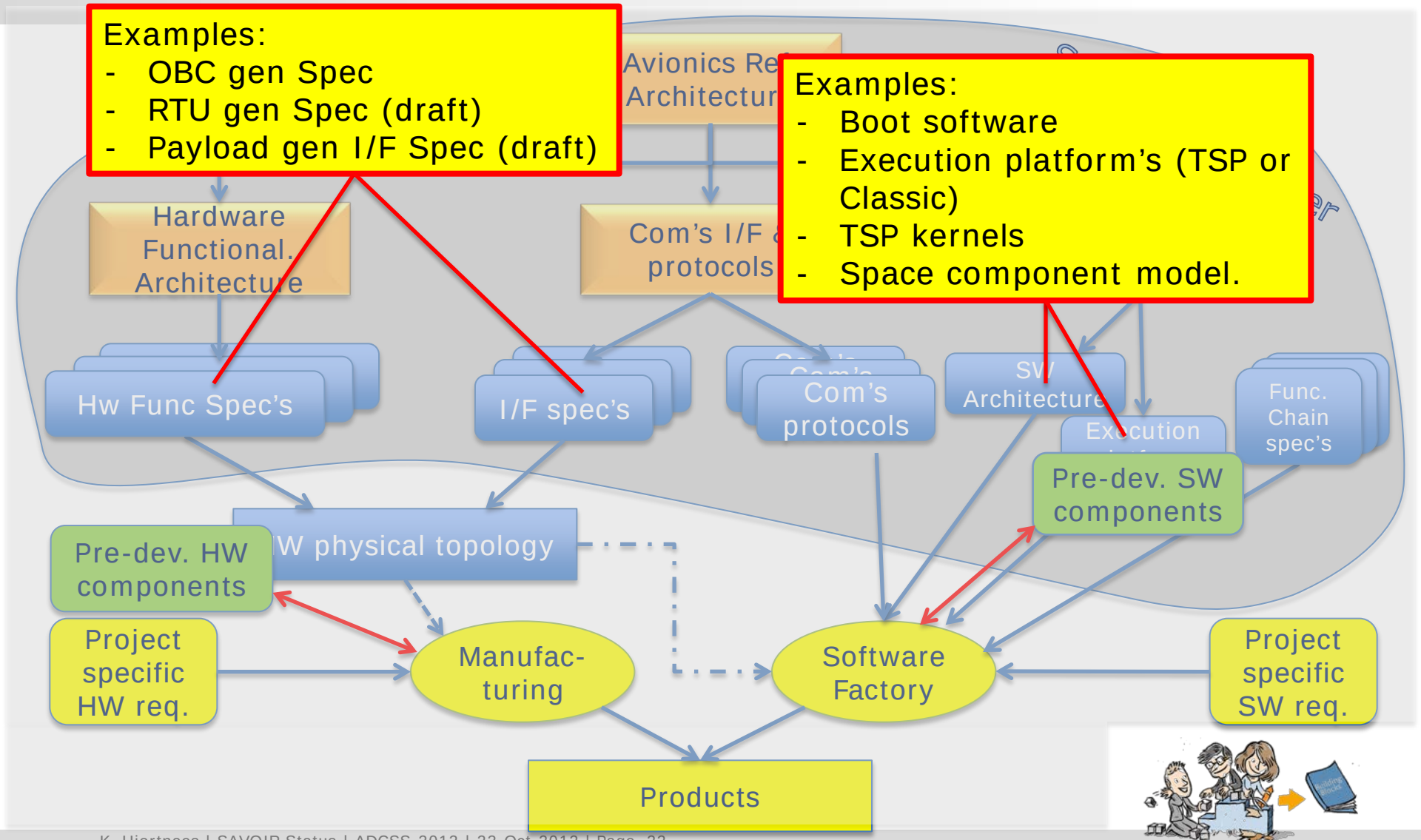
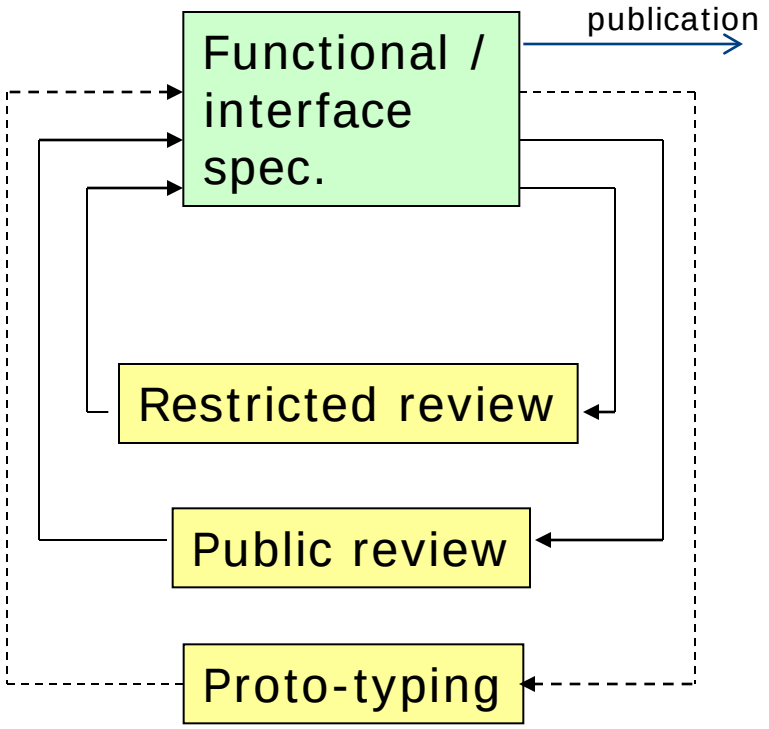


Specification production scheme.

Under SAG agreement;

1. A draft version is produced;
   - By a SAG working group
   - Output of an R&D activity
   - Proposed by Industry
   - ESA internal
2. Submitted for **restricted review** and updated as needed
   - Check compliance to SAVOIR architecture and principle
   - Completeness / consistency / etc
3. Submitted for **public review** and updated (same objective as 2)
4. Verified by **prototyping** – to demonstrate maturity of the spec., consistency with the ref architecture (as far as possible on a case by case basis)
5. **Publication**



Contact

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- Bernard Bruenjes- OHB
- Carsten Jørgensen – Terma
- Torbjörn Hult – RUAG
- Franco Boldrini – Selex Galileo