SAVOIR

space avionics open interface architecture

Introduction and Status of SAVOIR

On behalf of the SAVOIR Advisory Group
Jean-Loup TERRAILLON – ESTEC/TEC-S
Lead Software Systems Engineer

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, AirbusDS, 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.

Organisation

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

SAVOIR FAIRE	SAVOIR IMA	SAVOIR SAIF	SAVOIR SAFI	SAVOIR MASAIS
Software reference architecture	TSP based Software reference architecture	Sensor/Actuator Electrical interface (Data & Power)	Sensor/Actuator Functional Interface	Data Storage Access Interfaces and Services
		Finalised	**Finalised**	

SAVOIR UNION

Functional, performance, operational and interface requirements of the functional links

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**
  - **Model based avionics**
  - **End to end validation**

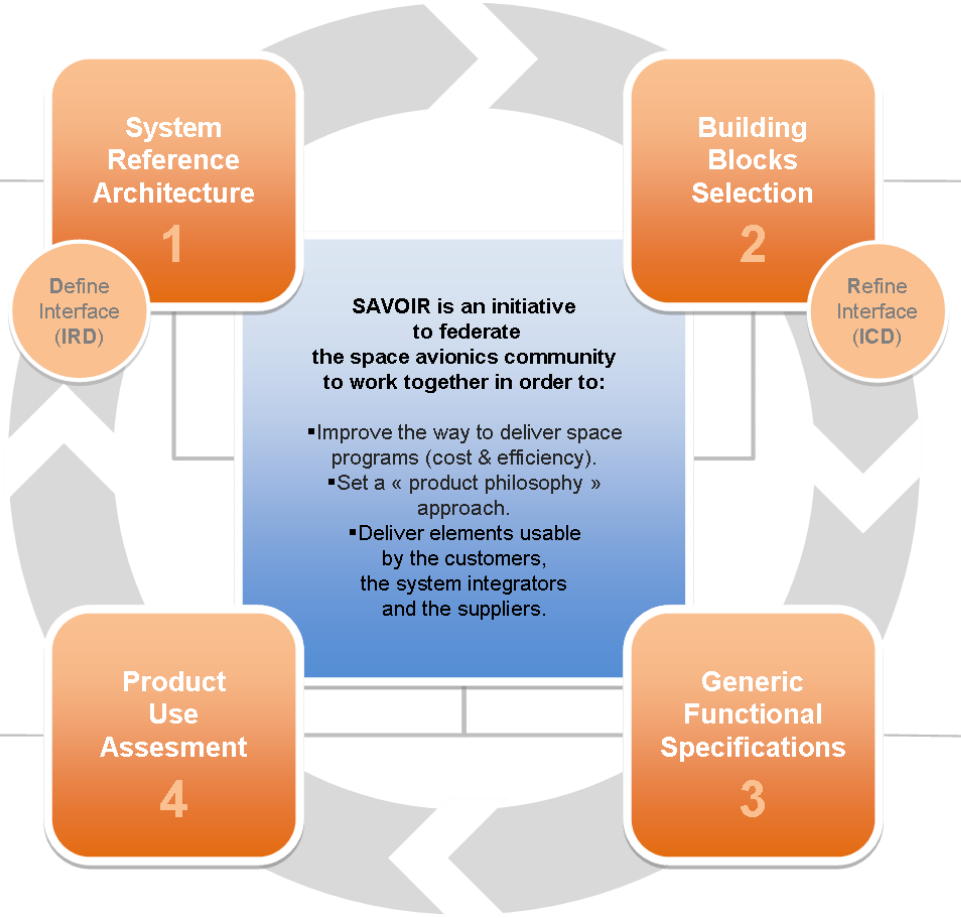
The SAVOIR wheel

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.



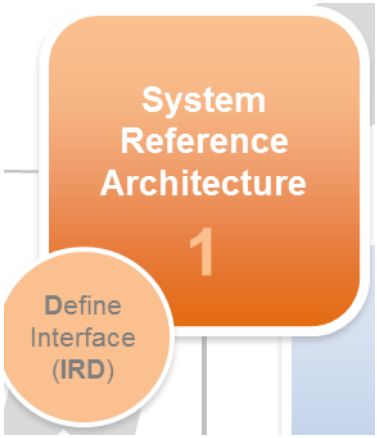
Measure the effectiveness of SAVOIR recommendations and approach, in terms of costs and effectiveness.

Key Performance Indicators

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

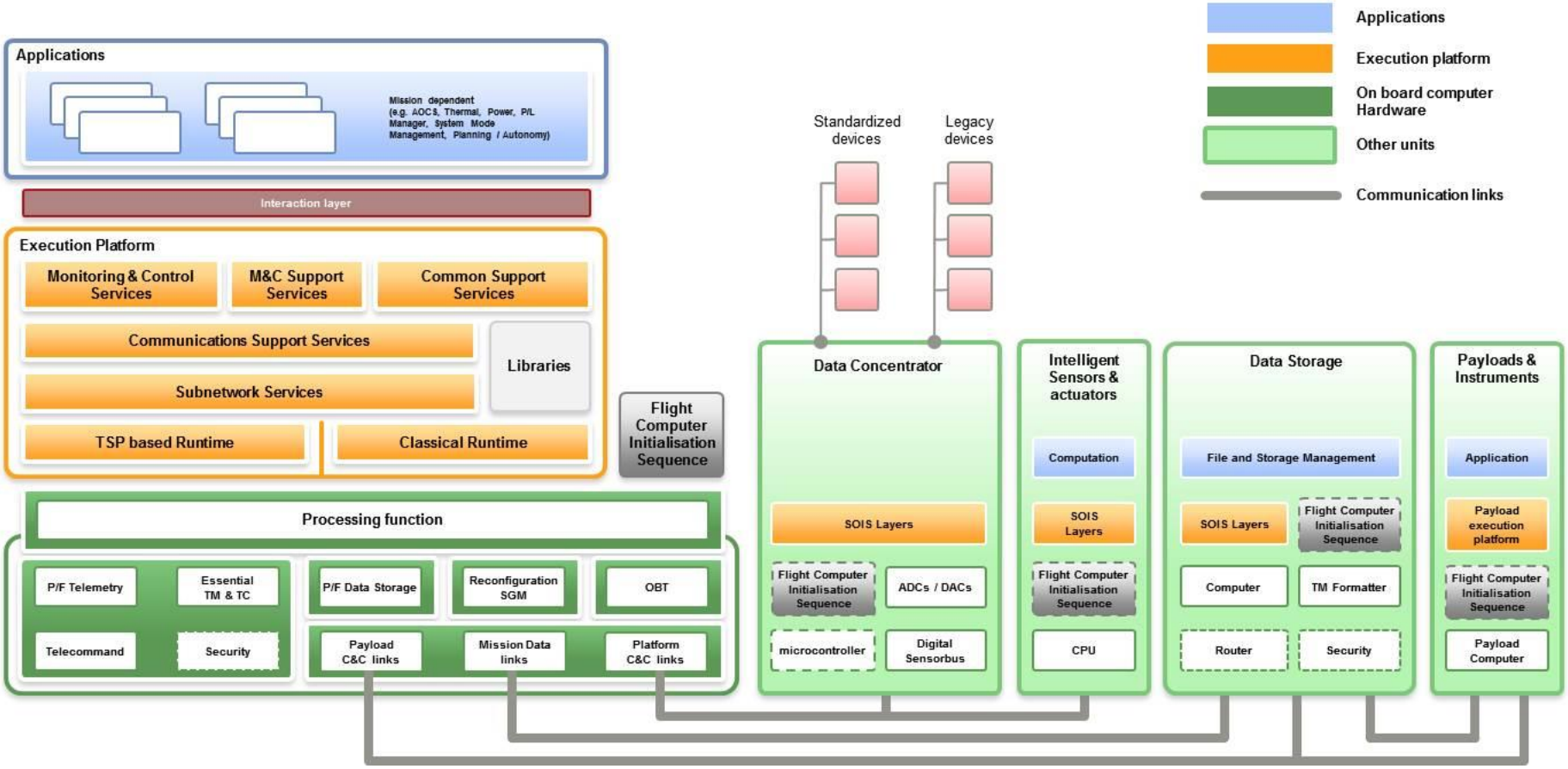
Reusable spec & I/F standards

SAVOIR process

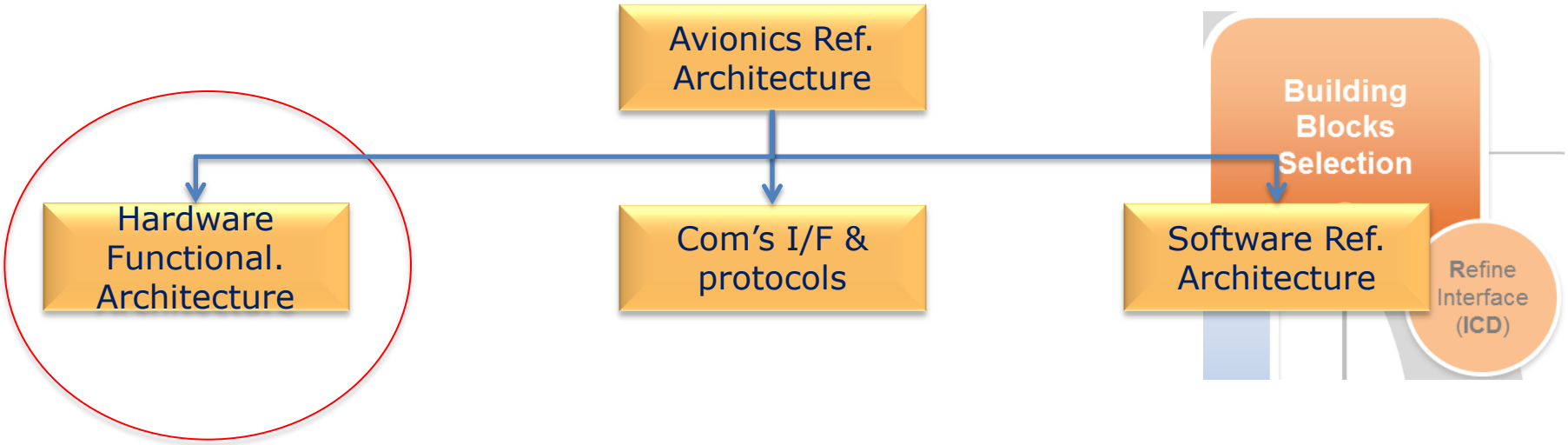


Avionics Ref. Architecture

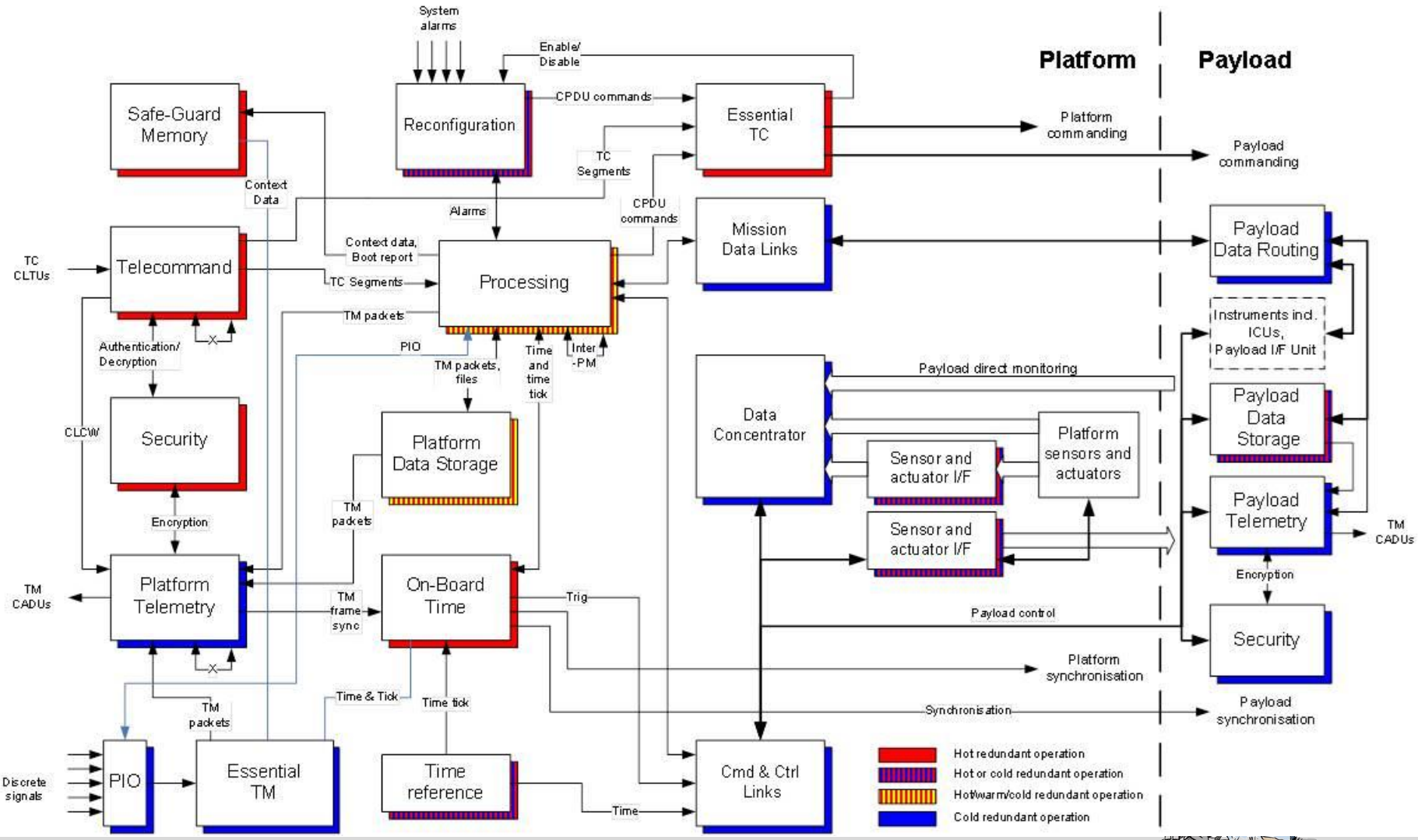
The Avionics Reference Architecture



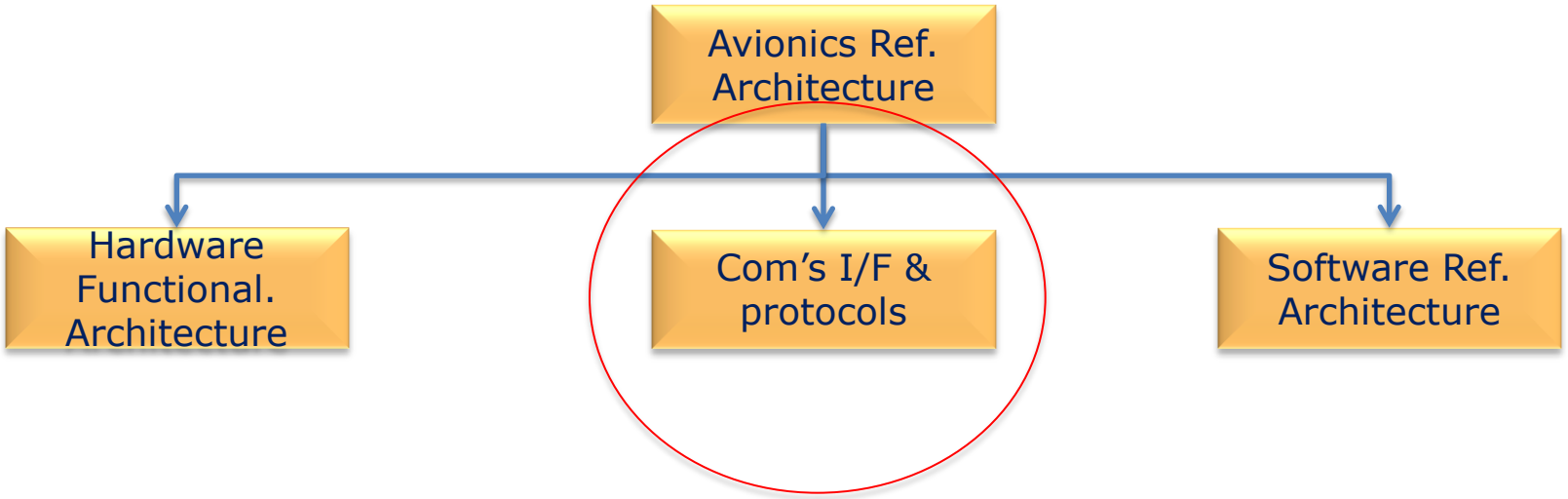
SAVOIR process



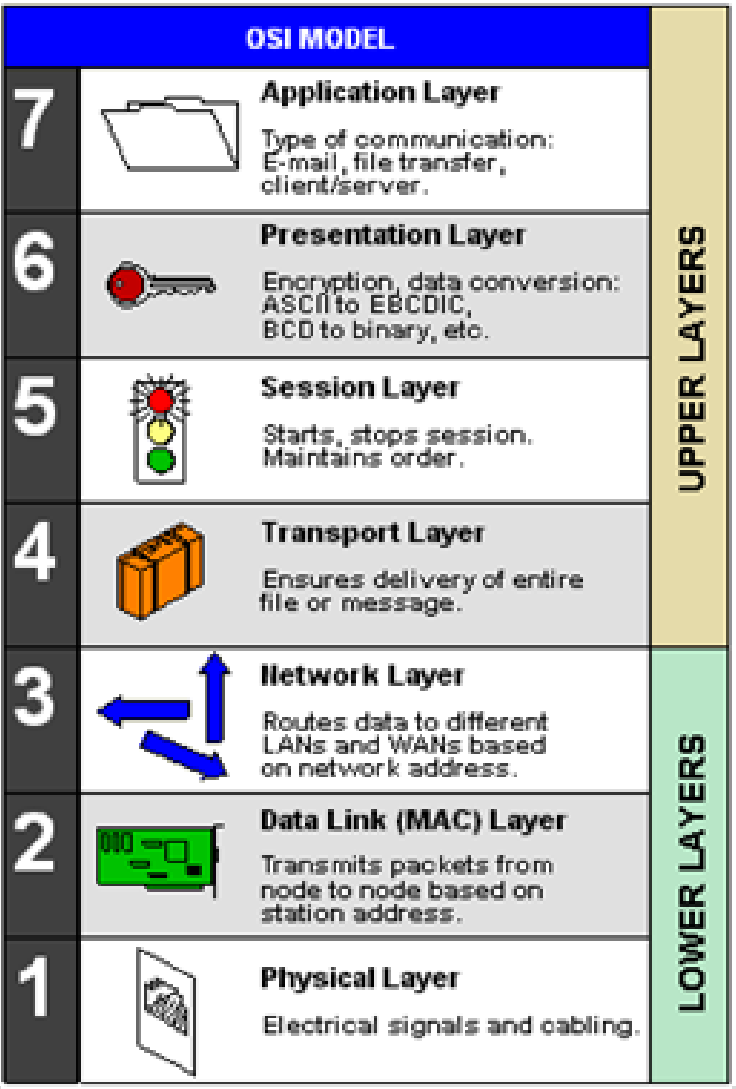
SAVOIR HW Reference Architecture Functional View.



SAVOIR process

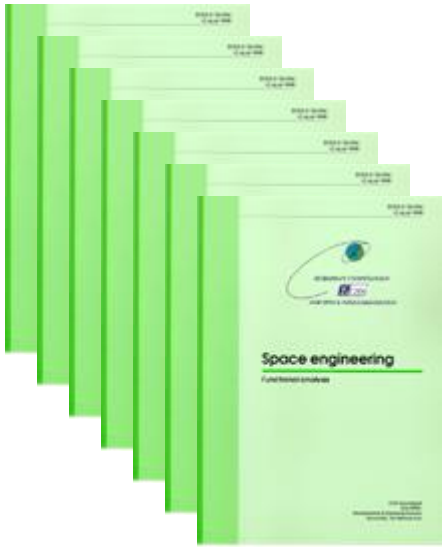


Communication Network & Protocols



CCSDS
The Consultative Committee for Space Data Systems

EUROPEAN COOPERATION
ECSS
FOR SPACE STANDARDIZATION



RS-422 Protocol

SAVOIR SAIF
space avionics open interface architecture

intended

ECSS-E-ST-50-14C
31 July 2008

EUROPEAN COOPERATION
ECSS
FOR SPACE STANDARDIZATION

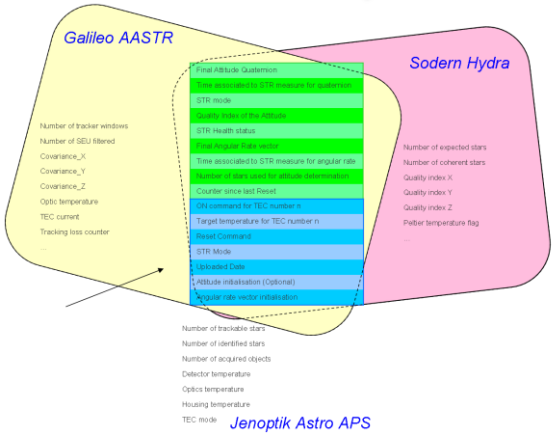
Space engineering

Spacecraft discrete interfaces

Star Tracker functional interface

SAVOIR SAFI
space avionics open interface architecture

intended



ECSS-E-ST-60-20C Rev. 1
15 November 2008

EUROPEAN COOPERATION
ECSS
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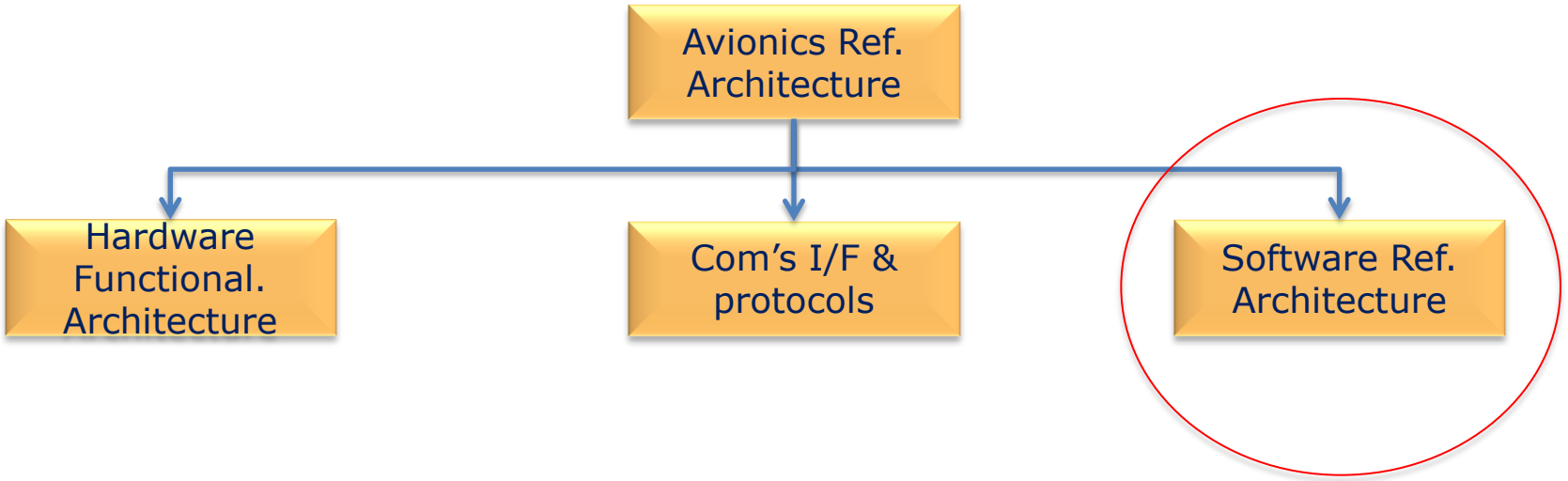
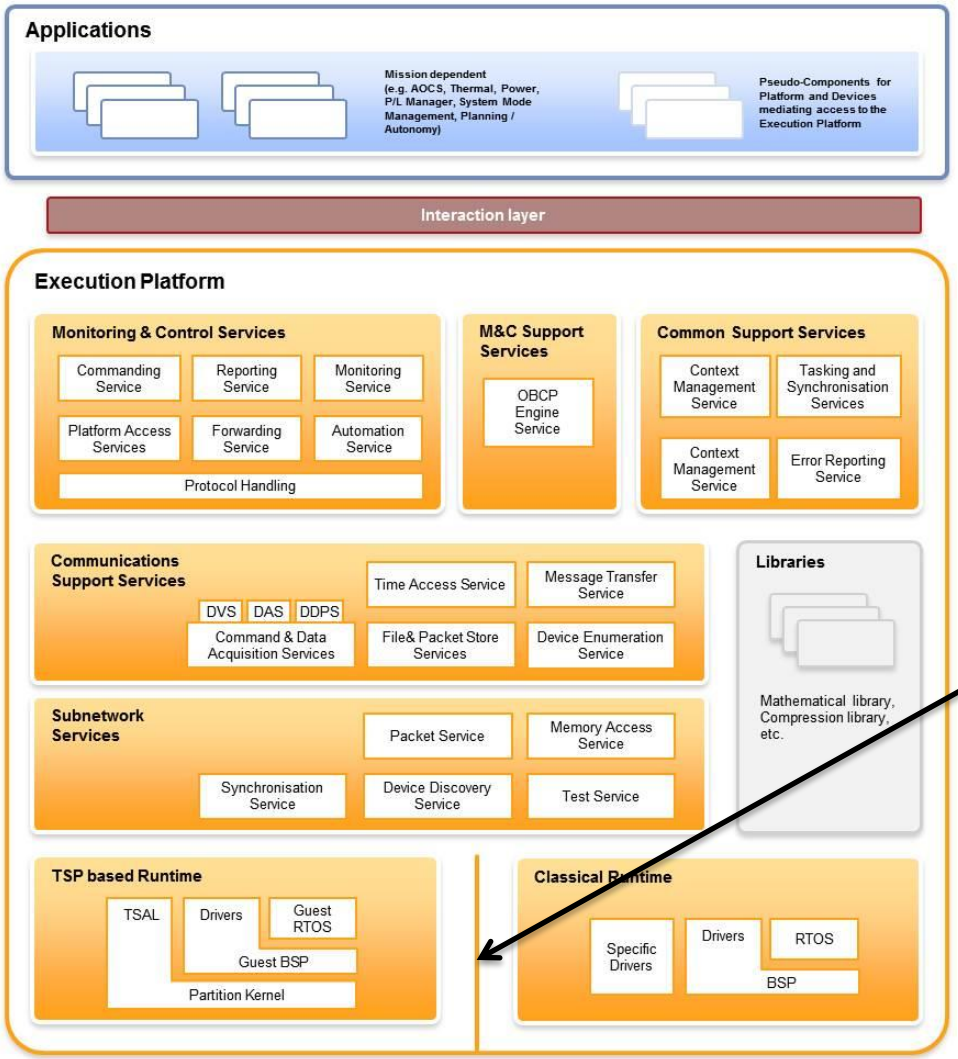
Space engineering

Stars sensors terminology and performance specification

SAVOIR process

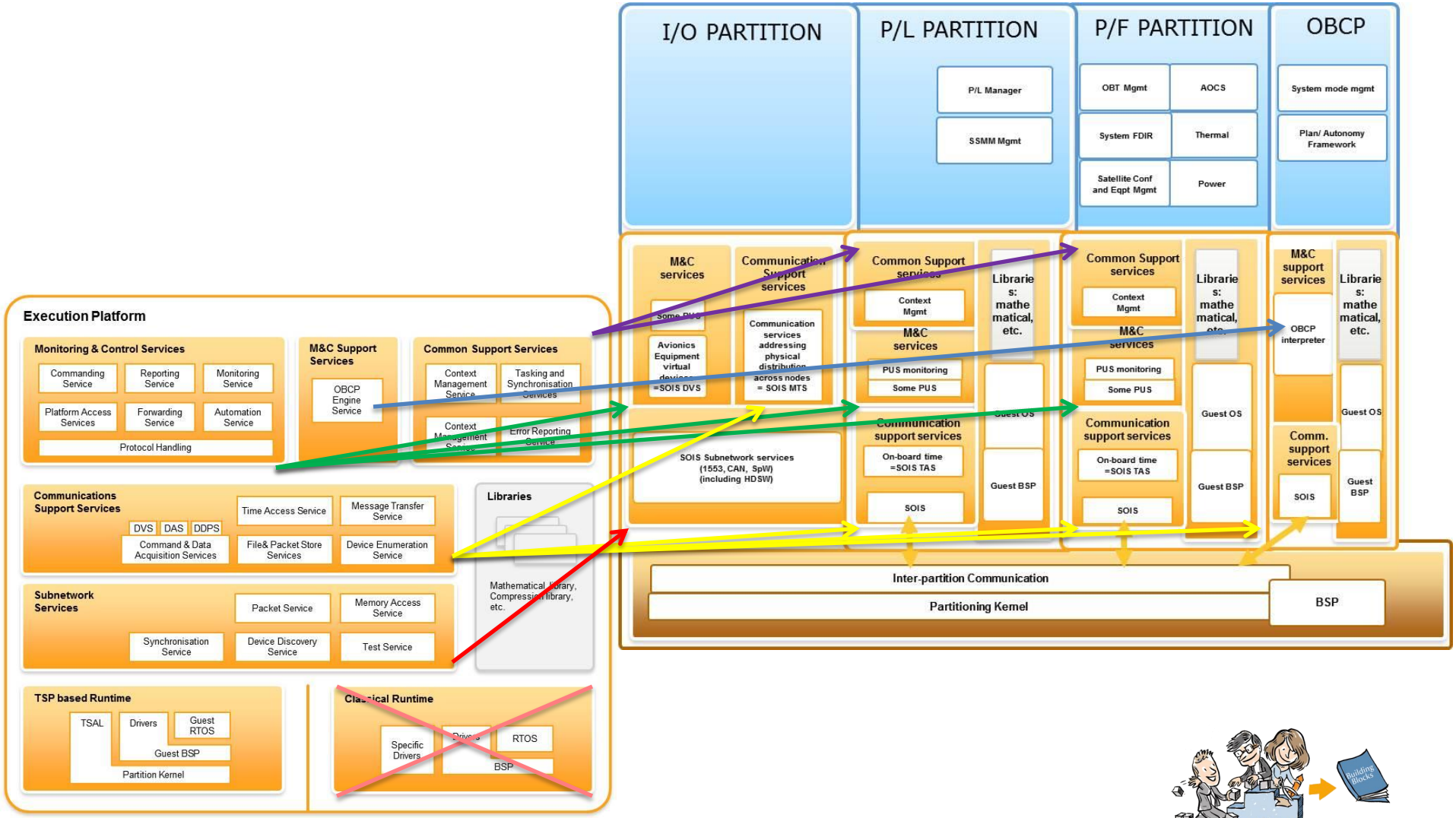


Software Reference Architecture

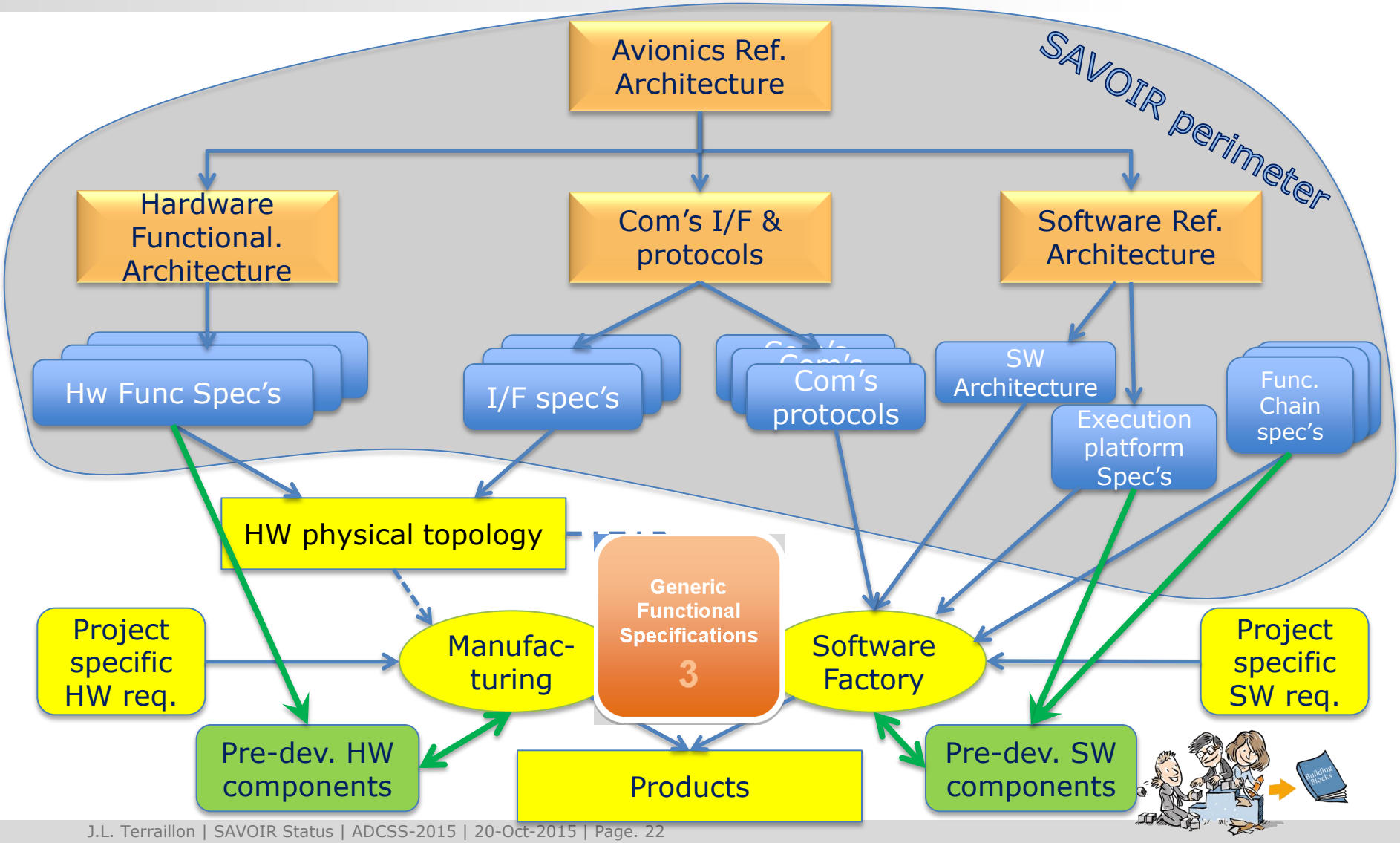


Configurable Execution Platform

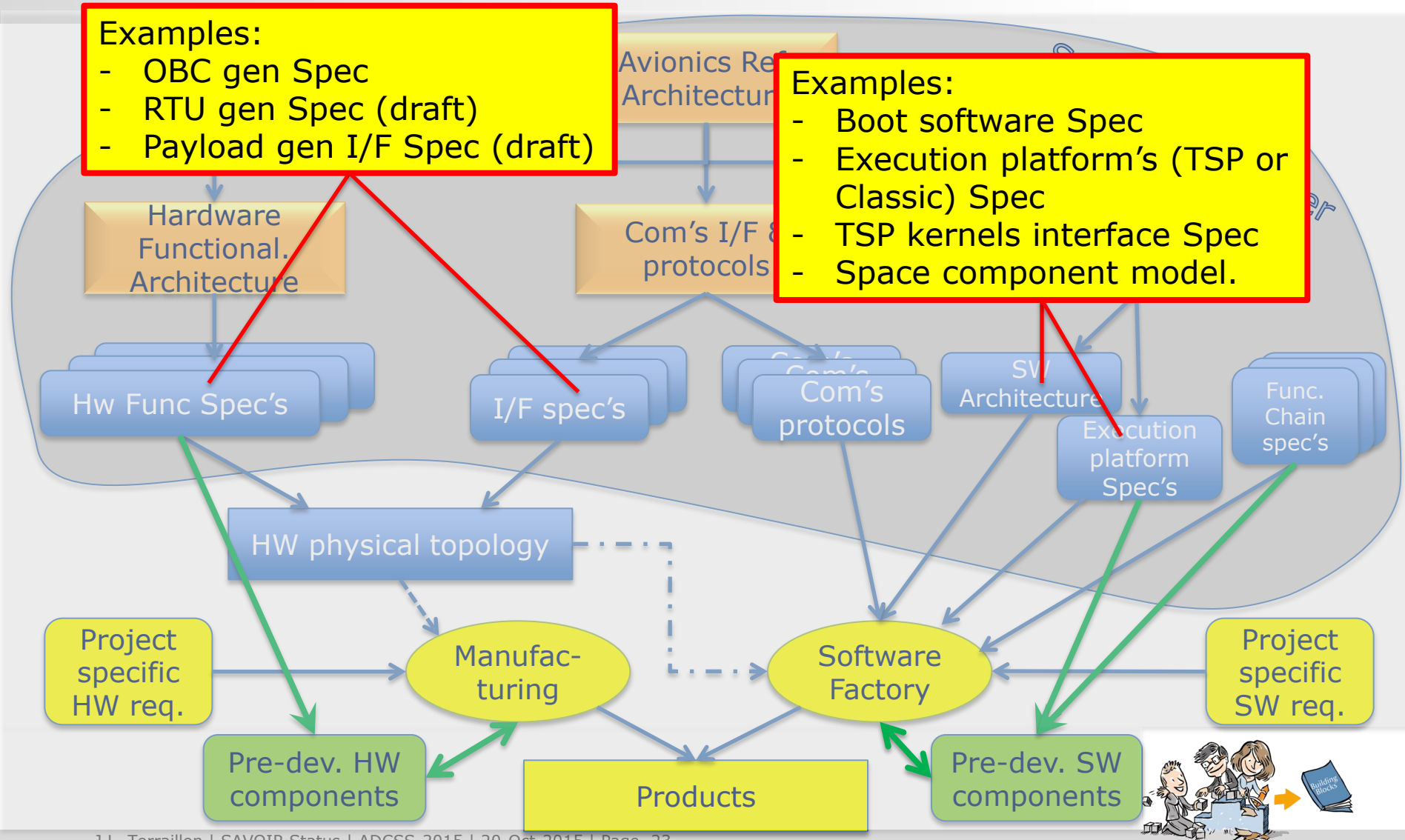
Software Reference Architecture
Execution Platform – 'Time & Space Partitioning'



SAVOIR process



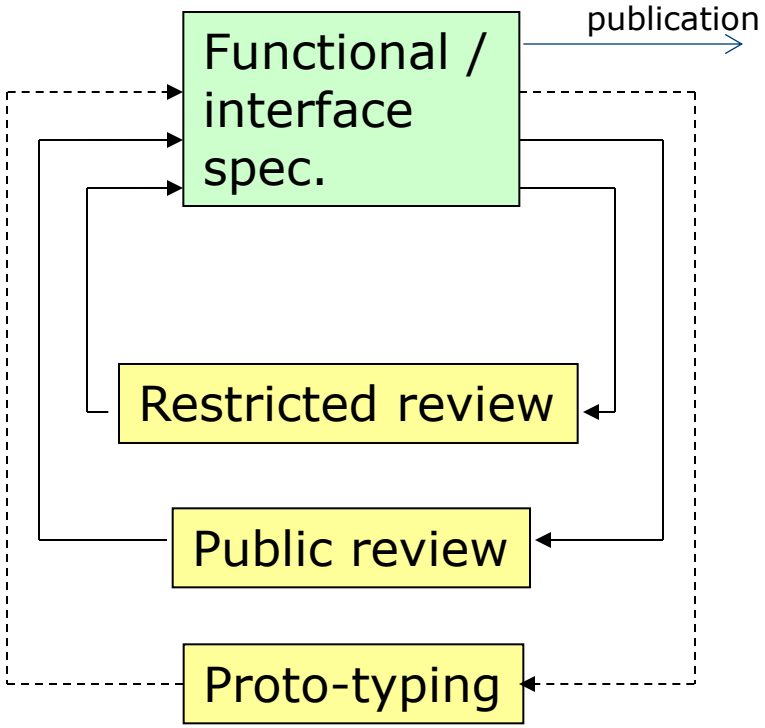
SAVOIR process



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**



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- Frank Dannemann – DLR
- Thierry Duhamel – Astrium
- Jacques Busseuil – ThalesAleniaSpace
- Bernard Bruenjes- OHB
- Carsten Jørgensen – Terma
- Torbjörn Hult – RUAG
- Franco Boldrini – Selex Galileo