Digital continuity between Systems Engineering and on-board software

Addressing the systems to software perspective

DEFENCE AND SPACE

Marie de Roquemaurel with Jacques Seronie-Vivien, Jean-Luc Marty, Ariane Sauvage
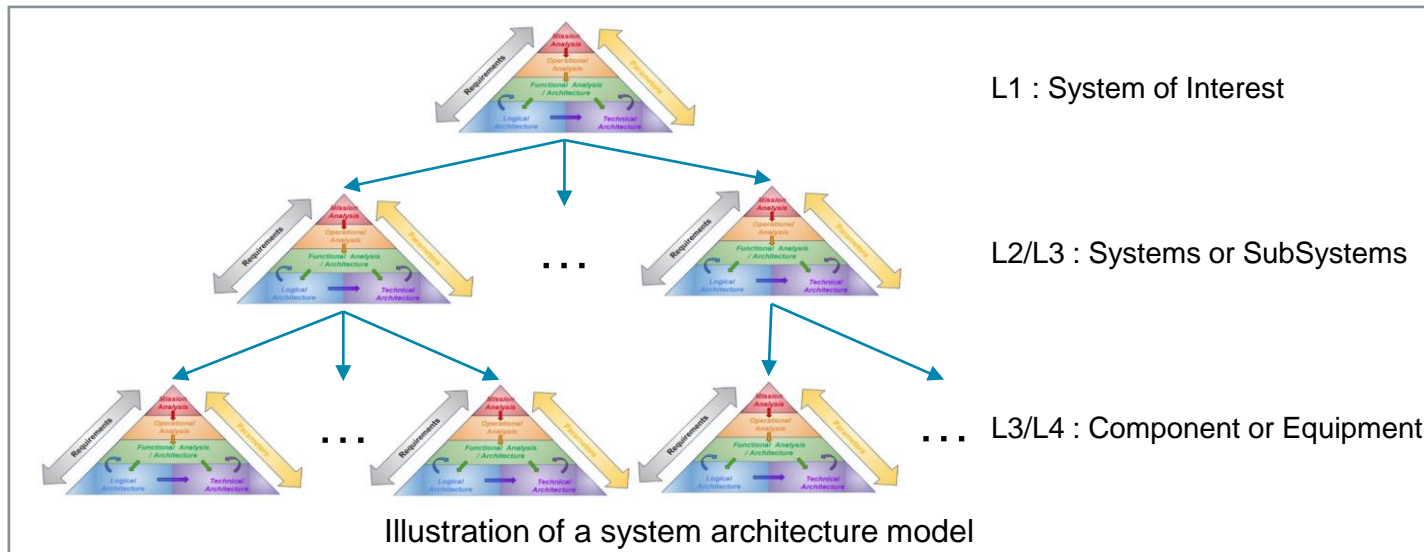4th Model Based Space Systems and Software Engineering - MBSE2023

AIRBUS

Statement of the problem

Scope

– Digital continuity : transition from documents-based approach to models-based

– How a system architecture model can generate some added-values for software ?

– During definition, usage and reuse of model

Hypothesis

– *A MBSE Architecture framework* satisfy process, methodology with customized tools, training and coaching

– *An architecture model* exists to define the system architecture

– Software elements are found at all levels

L1 : System of Interest

L2/L3 : Systems or SubSystems

L3/L4 : Component or Equipment

Illustration of a system architecture model

A System Architecture useful for software

Inputs:MBSE framework(s), System architecture model(s)
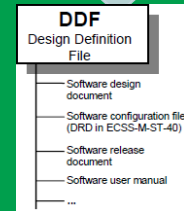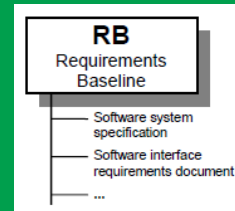
Answer: How an architecture model can help the software ?

AIRBUS

Where a system architecture model can help the software ?

System/Software Communication

- Co-engineering and interoperability
- Technical consistency with 1 source of truth

Software Specification

- Generation of software documents
- *ToBeDetailed during workcoffee*

RB
Requirements Baseline
— Software system specification
— Software interface requirements document
— ...

DDF
Design Definition File
— Software design document
— Software configuration file (DRD in ECSS-M-ST-40)
— Software release document
— Software user manual
— ...

Software Implementation

- Capture of software data
- Initialisation of software models

...

System model as software input

Focus on added-value for Software Specification

Propose
- improvement points
- Research Directions

AIRBUS

How a system architecture model can help the software?

- **Define severals 4-boxes**
  - to share problem, solution, difficulty, blocking-point,…
  - on a topic related to system architecture for the software specification

- **Identify improvement points and research directions**
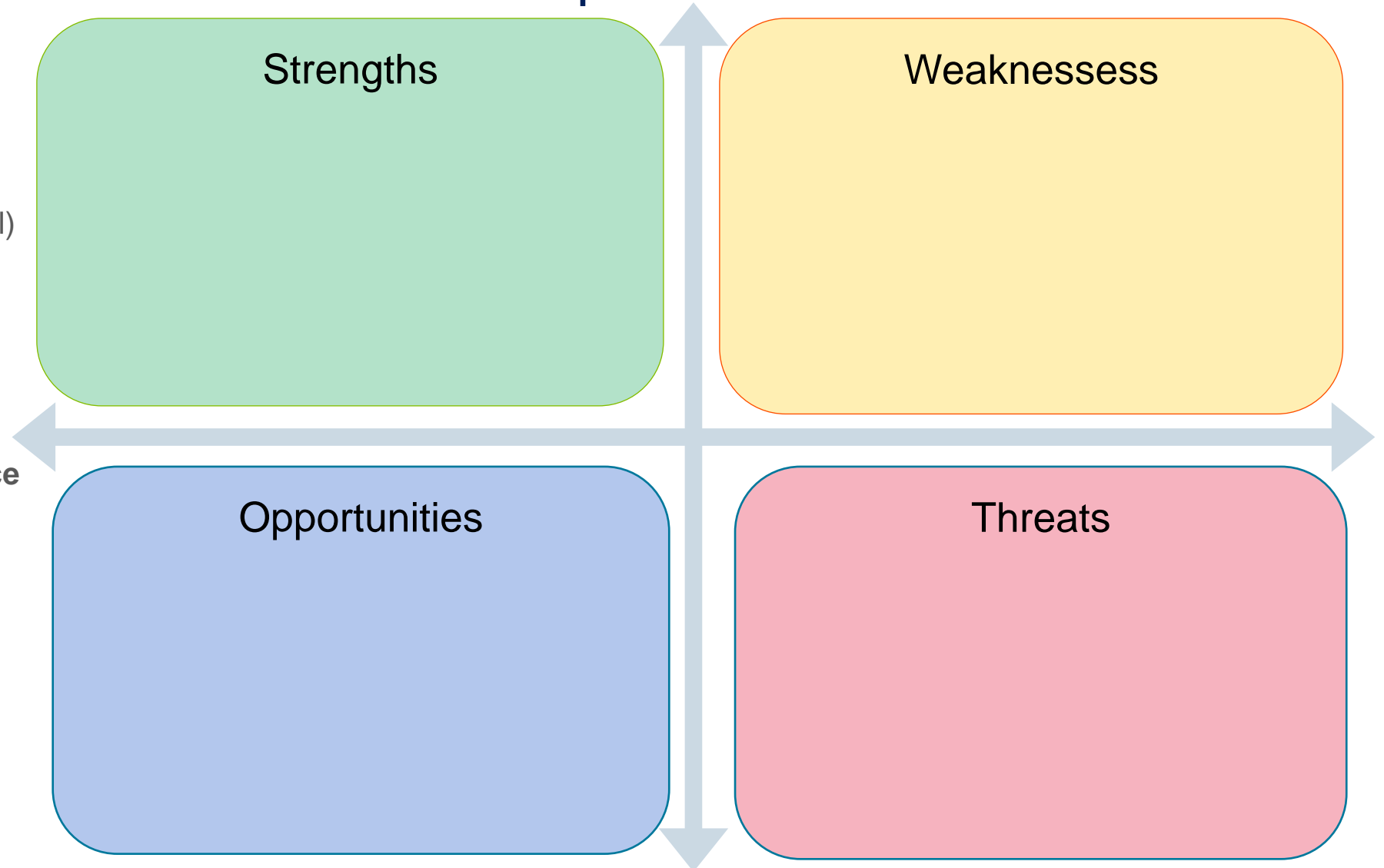 - to the MBSE community

Short description of topic

Strengths

Weaknessess

Opportunities

Threats

Software Specification

- Creation of 4boxes to capture and share exchange

- Identification of improvement points and reserach directions

AIRBUS

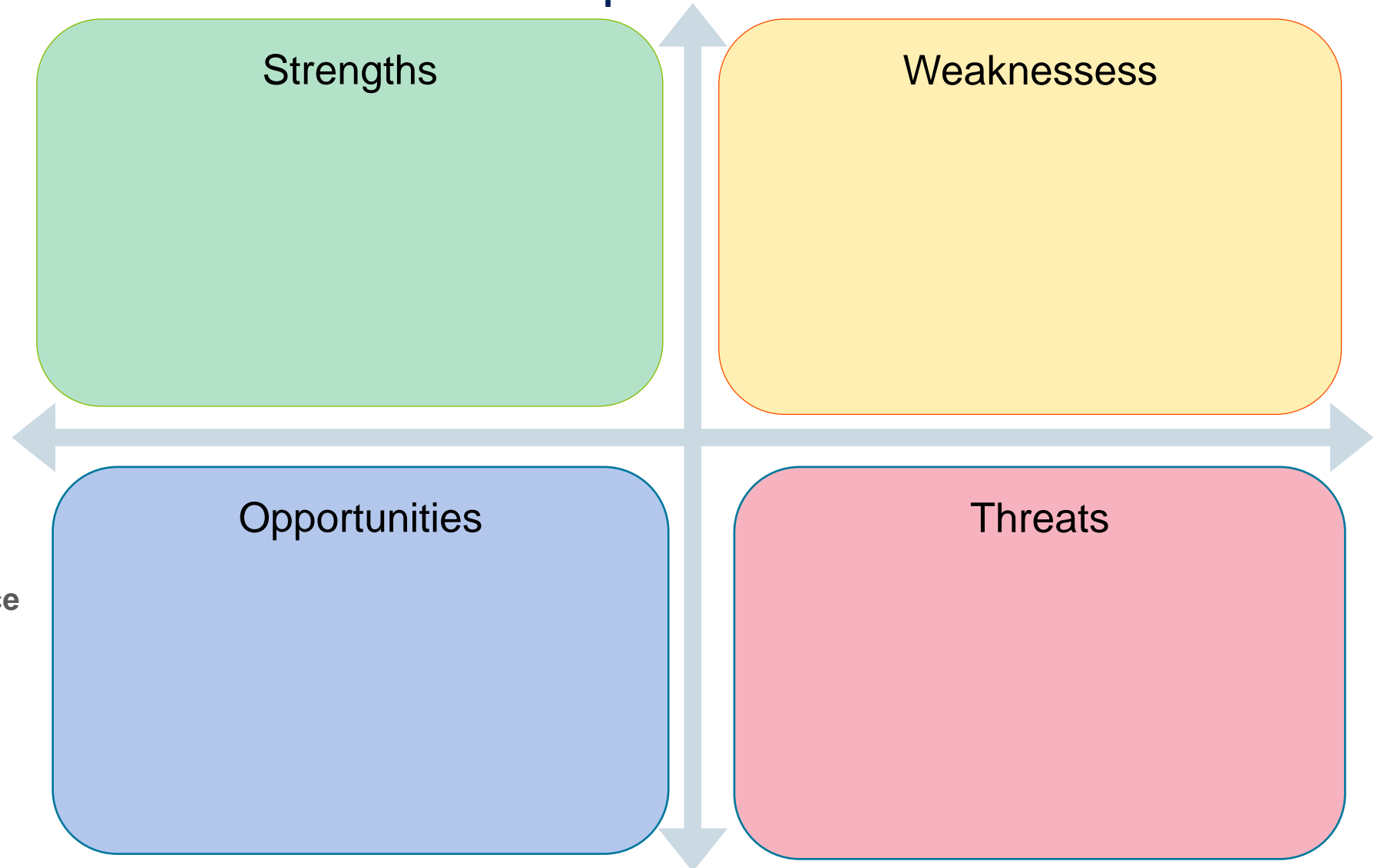# Thanks for your attention

AIRBUS

How a system architecture model can help the software communication?

- **Scope, objectives**
  - Internal/external
  - Support (picture, html, model)

- **Co-engineering**

- **Interoperability**

- **Sharing, storing, Maintenance**

Strengths	Weaknessess
Opportunities	**Threats**

AIRBUS

How a system architecture model can help the software documentation?

- **Scope, objectives**
  - Contribution/generation on specification ?
  - Model delivered?
  - Selected document/element

- **Relation between requirements and model**

- **Review**

- **Sharing, storing, Maintenance**

Strengths	Weaknessess
Opportunities	**Threats**

AIRBUS

How a system architecture model can help the software?

• **New Topic**

Strengths	Weaknessess
Opportunities	**Threats**

AIRBUS