FIXING REFERENCE ARCHITECTURES
A GENERIC VIEW

Richard Doornbos, Jelena Marinčić, Gunnar Raschke, Lars Idema, Jos Hegge

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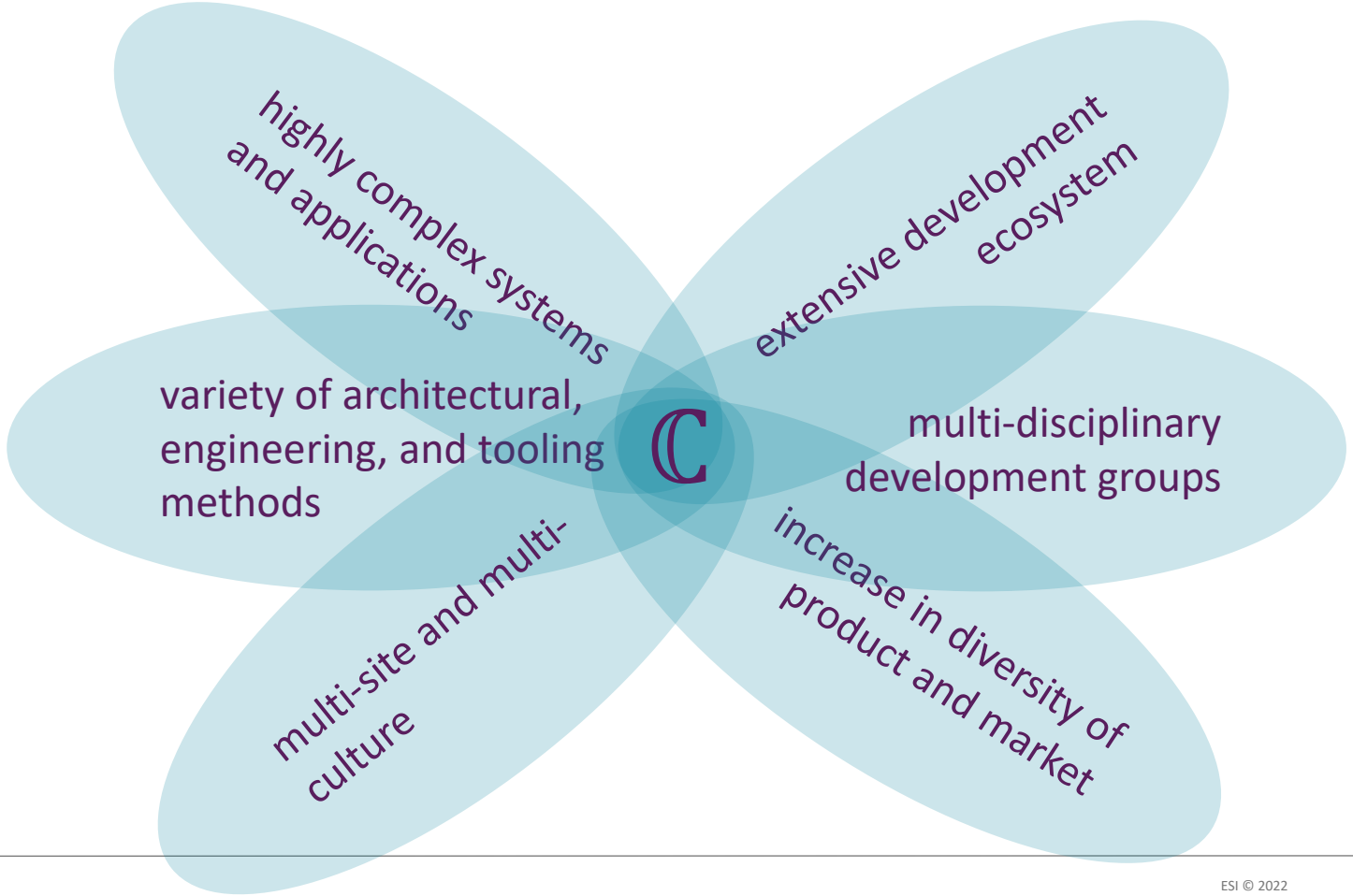
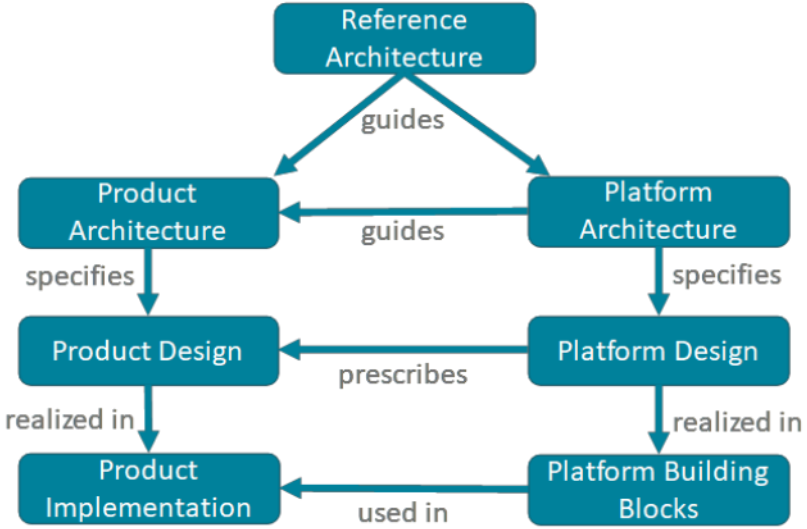


CHALLENGE 1:
HOW TO IMPROVE THE EFFECTIVITY OF R&D?

Many companies aim for effective and efficient R&D to enable fast innovation

Approach: create and use a ***Reference Architecture*** to guide product and platform development

- alignment in the organization: a shared baseline of why, what, and how
- guidance for future developments



CHALLENGE 2:
HOW TO CREATE A REFERENCE ARCHITECTURE?

Capturing the essence of existing architectures/products

- how to capture the knowledge, the rationales of earlier decisions?

Aiming for future architectures/products

- what are the future product features?
- what is the fit to vision and strategy?
- how dedicated should the architecture be?

Approach: information structure

- supports the creation process

Approach: modeling

- in each view appropriate formalisms
- connections!

Customer Value | Business Value

Customer Workflows | Business Processes

System Workflows

System Functions

(Reference) System Decomposition

System Configurations & Realizations

Customer Requirements | Factory Requirements

System (trade-offs and design decisions)

Qualities

Physical Processes

Specific Knowledge Domains

...

Components | External Materials | Consumables | ...

Architecting — *System design*

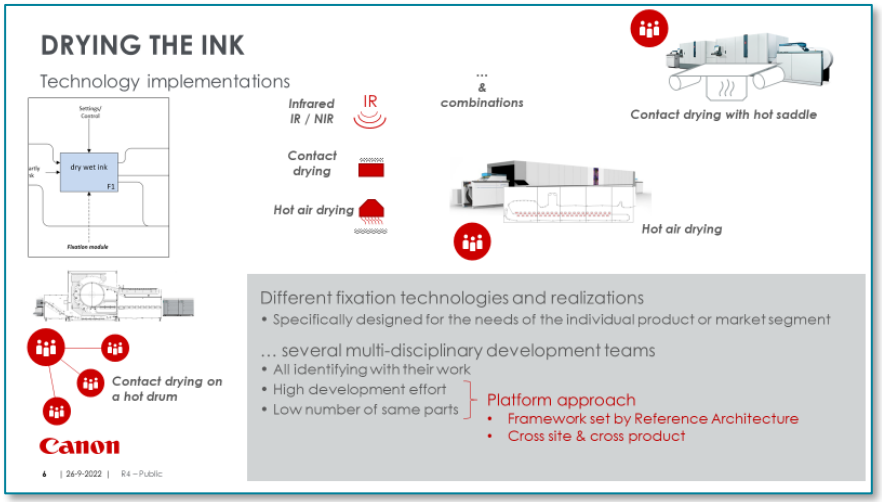
CHALLENGE 3:
HOW TO USE THE REFERENCE ARCHITECTURE?

Exploit the technical and organizational benefits:

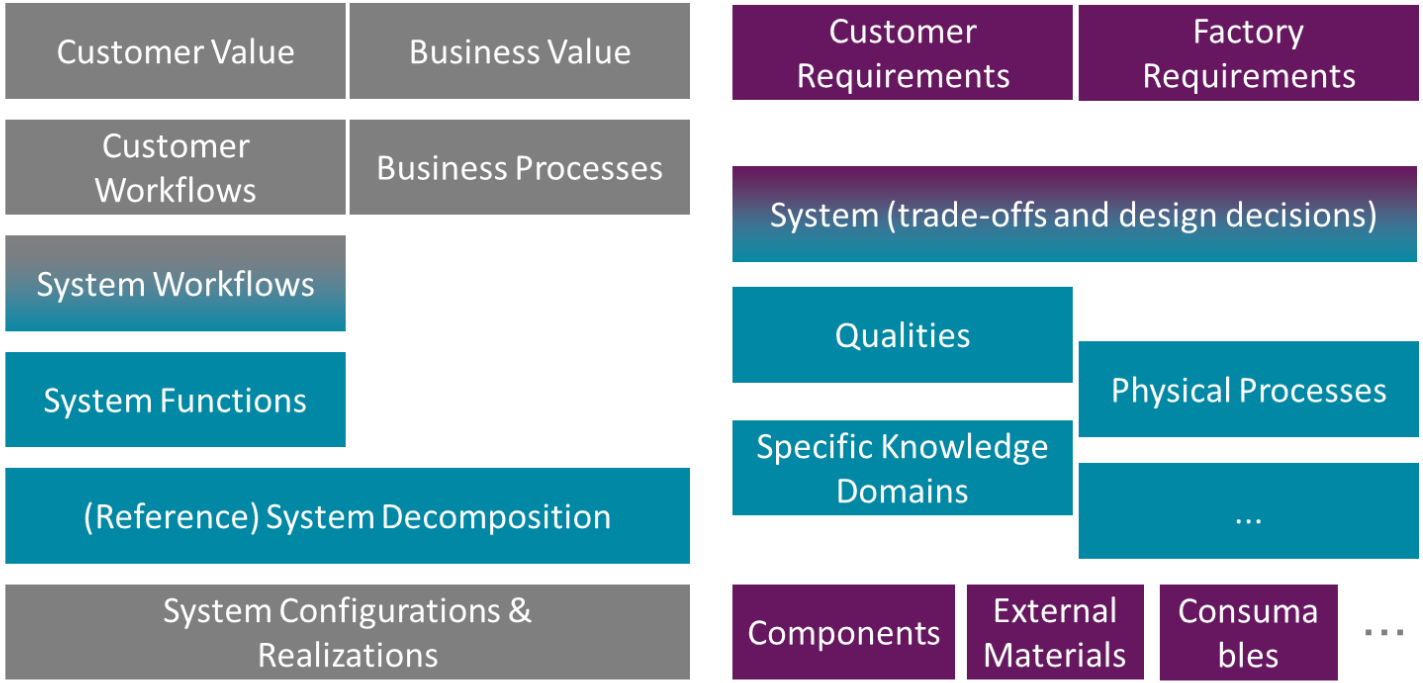
- stimulate systems thinking, organize ownership
- central point of system knowledge, easier knowledge sharing across sites and disciplines
- **explicit reuse reasoning**, roadmapping and defining new products, etc.

Example: is reuse of a fixation module possible?

- how different are the customer values with respect to fixation across the product portfolio?
- do we need different fixation processes?
- can the fixation module realize the requirements?
- are there multiple technical solutions to choose from?
- can we quantify the impact on other system qualities and *Total Aspects*?



AN EXAMPLE:
IS REUSE OF A FIXATION MODULE POSSIBLE?



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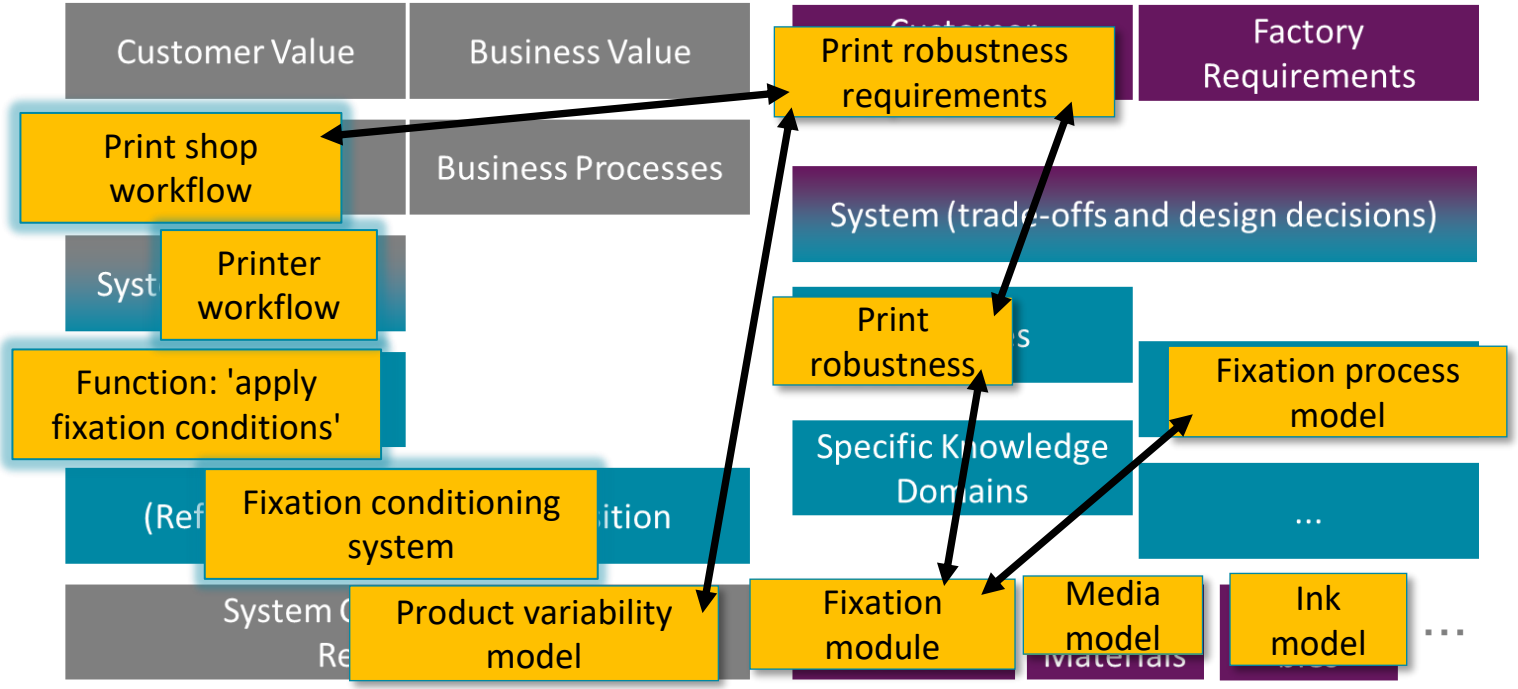
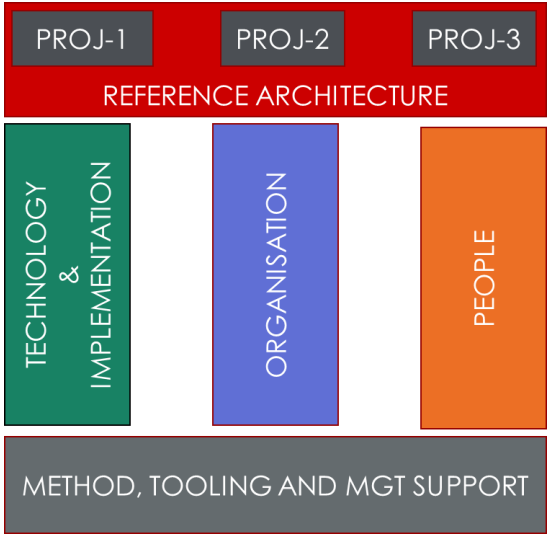
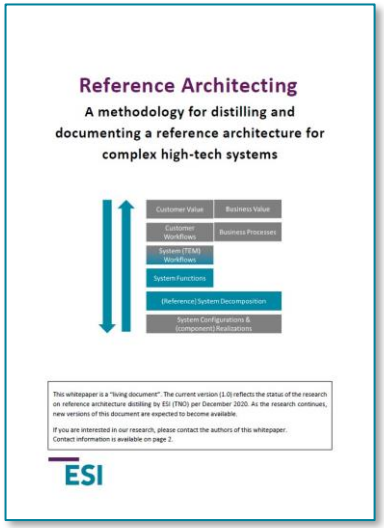


CONCLUSION

Reference Architectures are **essential** for product and platform architecture development



Go Deeper:



Reference Architecting

- **Control Complexity**
- **Common Understanding**
- **Mitigate Risks**
- **Promote Synergy**

https://esi.nl/research/output/methods/reference-architectures-for-product-families

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Thank You

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