FIXING REFERENCE ARCHITECTURES
A GENERIC VIEW

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A variety of architectural, engineering, and tooling methods, combined with a highly complex systems and applications, create an extensive development ecosystem that supports multi-disciplinary development groups. This leads to a multi-site and multi-culture approach, increasing the diversity of product and market.
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!

<table>
<thead>
<tr>
<th>Customer Value</th>
<th>Business Value</th>
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<tbody>
<tr>
<td>Customer Workflows</td>
<td>Business Processes</td>
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<tr>
<td>System Workflows</td>
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<td>System Functions</td>
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<td>(Reference) System Decomposition</td>
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<tr>
<td>System Configurations &amp; Realizations</td>
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Customer Requirements | Factory Requirements
System (trade-offs and design decisions)
Qualities
Physical Processes
Specific Knowledge Domains
Components | External Materials | Consumables | ...
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?

Customer Value | Business Value
---|---
Customer Workflows | Business Processes
System Workflows
System Functions
(Reference) System Decomposition
System Configurations & Realizations

Customer Requirements | Factory Requirements
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Architecting
AN EXAMPLE: IS REUSE OF A FIXATION MODULE POSSIBLE?

- **Print shop workflow**
  - Function: 'apply fixation conditions'
  - Fixation conditioning system
  - Product variability model

- **Print robustness**
  - System (trade-offs and design decisions)
  - Specific Knowledge Domains
  - Fixation process model

- **Ink model**
- **Media model**
- **Fixation module**
- **Print robustness requirements**
- **Customer Value**
- **Business Value**
- **Business Processes**
- **Factory Requirements**

**Architecting**
CONCLUSION

Reference Architectures are essential for product and platform architecture development

Go Deeper:

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