



Simplifying MBSE in the Textile Industry: The ARISE Journey at Rieter

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ABOUT RIETER

Rieter is the world's leading supplier of systems for manufacturing yarn from staple fibers in spinning mills. Based in Winterthur (Switzerland), the company develops and manufactures machinery, systems and components used to convert natural and man-made fibers and their blends into yarns in the most cost-efficient manner. Cutting-edge spinning technology from Rieter contributes to sustainability in the textile value chain by minimizing the use of resources. Rieter has been in business for more than 225 years, has 18 production locations in ten countries and employs a global workforce of around 5 600, about 16% of whom are based in Switzerland. Rieter is listed on the SIX Swiss Exchange under ticker symbol RIEN.

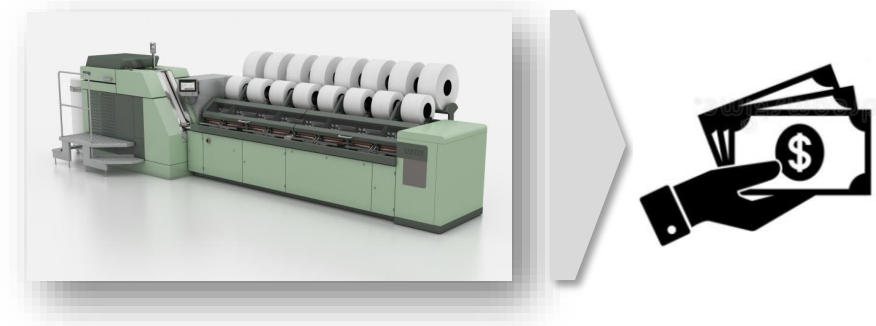
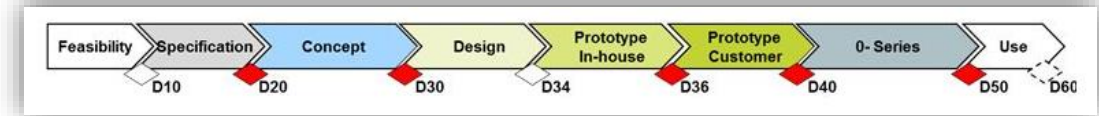
Goal of the Presentation



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- Showing a best practice to improve the innovation process:
 - How to trace stakeholder needs down to system requirements into a product we earn money with
- Status of Model Based Systems Engineering implementations at PU Combing
 - **MBSE** is a topic since over 6 years at PU Combing



WHY > Increasing Complexity

How to turn the current weakness in the innovation process into a strength asap to defend against market threats and to turning opportunities into successful products.



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Functions

Components

Interactions

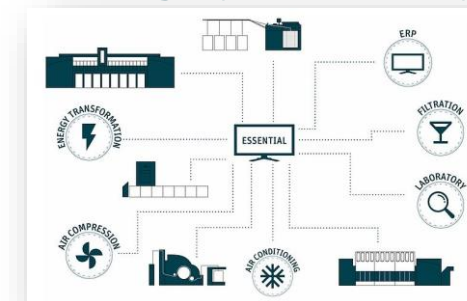
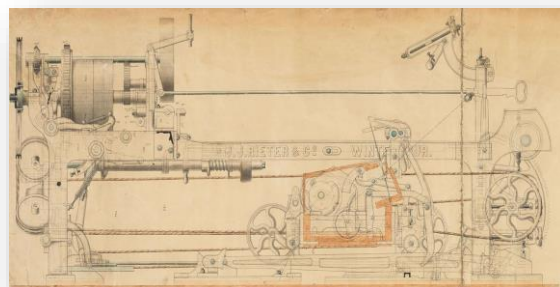
Systems Engineering Tools



Documenting single Systems

Modeling single Systems

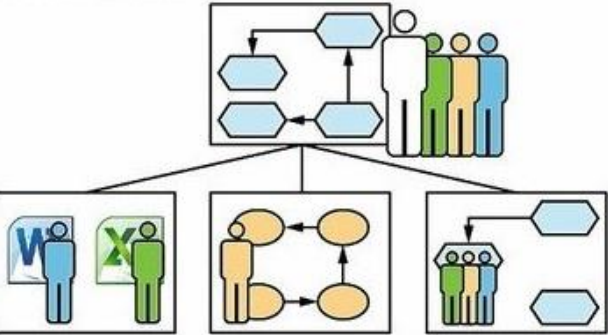
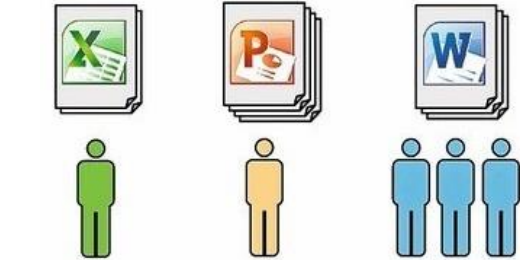
Modeling Systems of Systems



Source: International Council on Systems Engineering (INCOSE) Vision 2025

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Drawing, Documenting, or Modelling

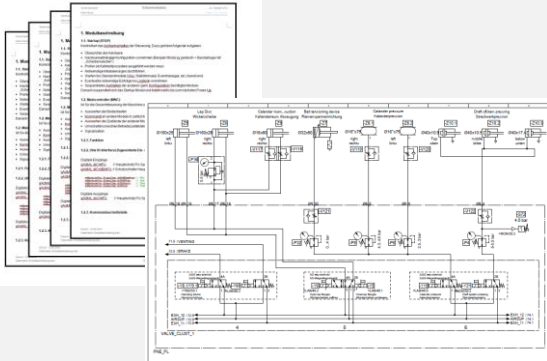


System

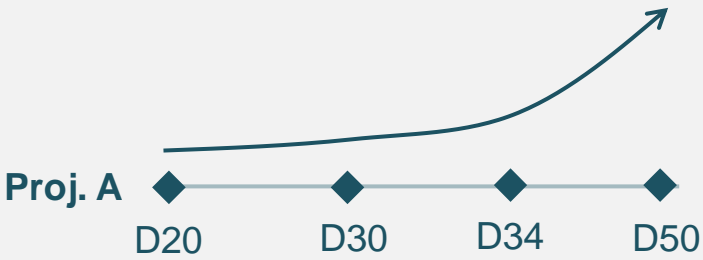
Mech.

Electro

SW



Workload is exponential increasing to keep the documents updated

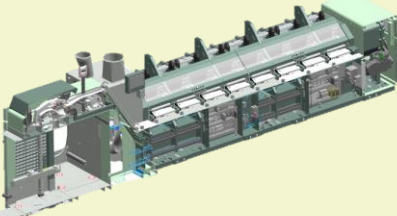
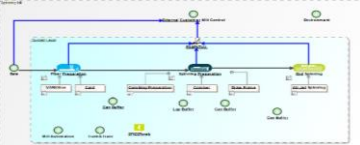


System

Mech.

Electro

SW



Glossar

Relations Matrix

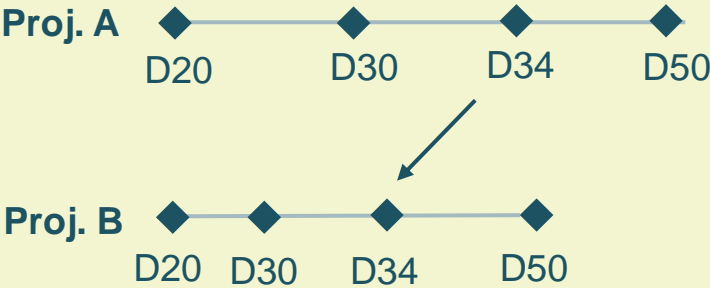
Traceability

EBOM

Simulation

→ Digital Twin

Reusability



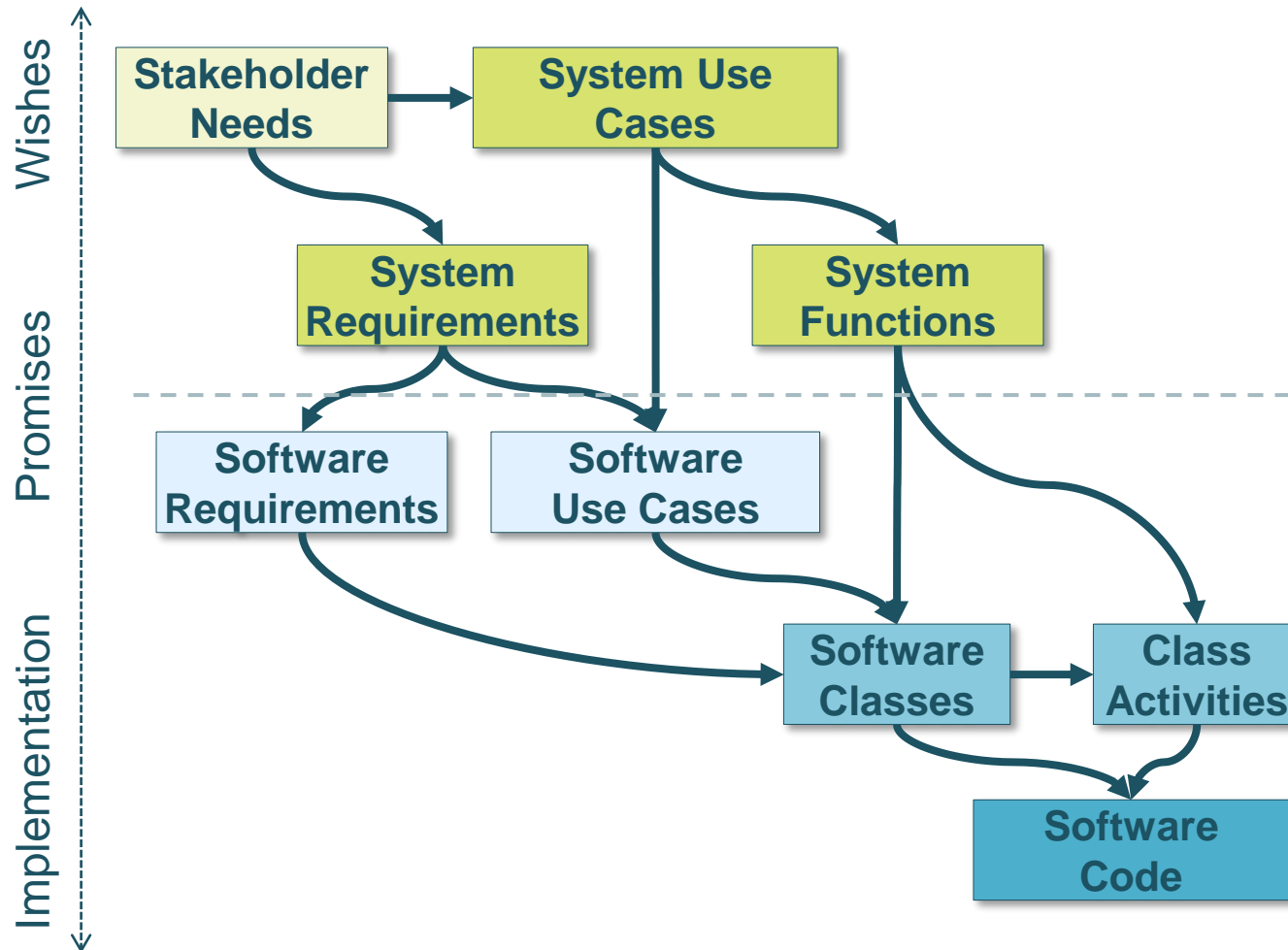
WHO > is involved with which information?



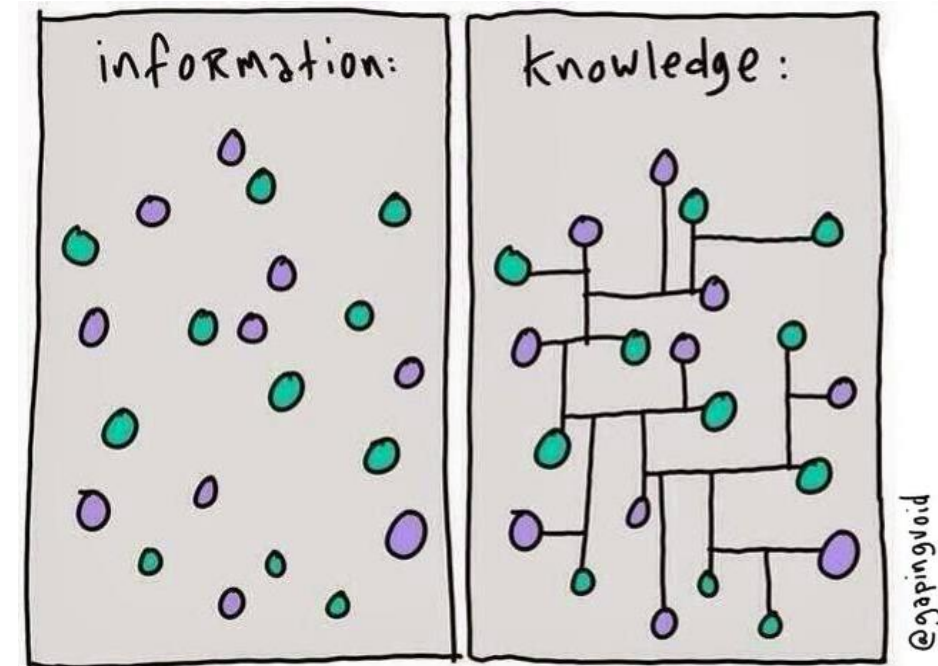
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Who is **RESPONSIBLE** and who is **ACCOUNTABLE** for the **CONNECTIONS** between the information?



Not limited to software also applicable to technology, mechanics and electro



HOW > ARISE Methodology

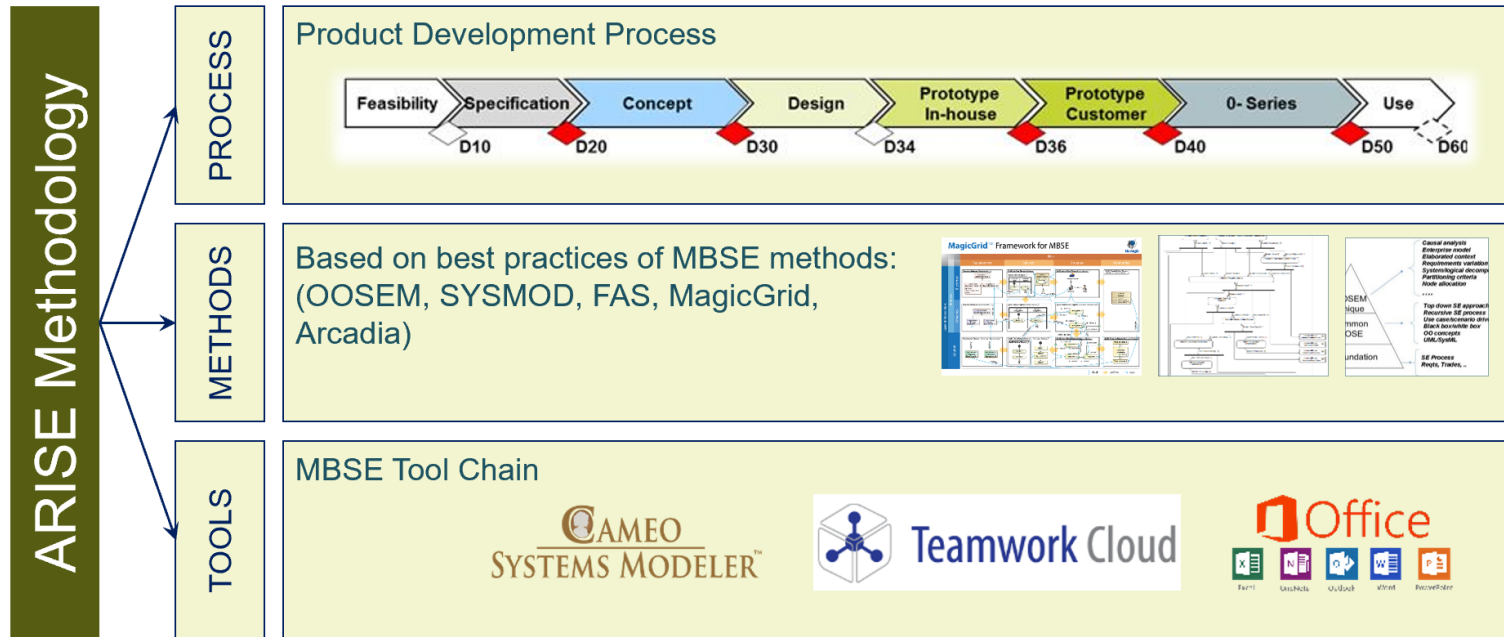


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ARISE: Agile Rieter Integrated Systems Engineering

- Solution based on **industrial and ISO standards**
- Not **only-tool-solution** but also **process (what)** and **method (how)**
- Tailored solution: **simplified method** and **advanced method**



Customer-engaged Approach

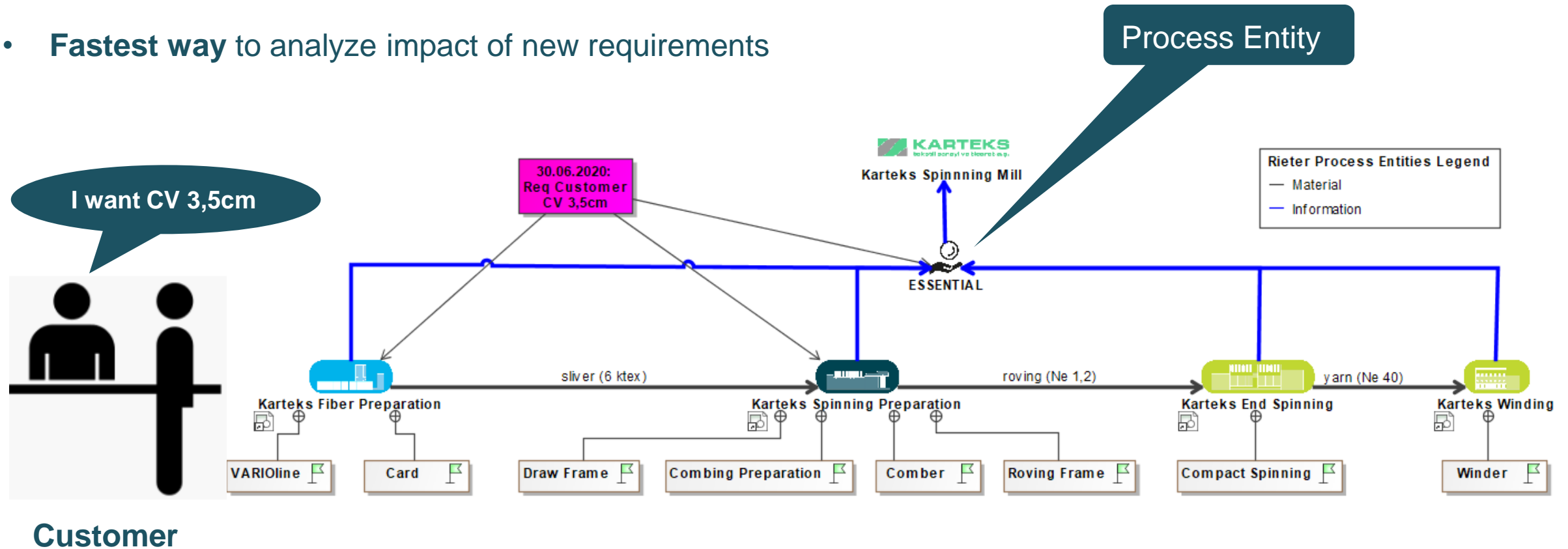


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Connected Data > Not only Power Point drawings, Visio, Confluence or Excel

- **Transparent** and reliable overview of a complex system
- **Fastest way** to analyze impact of new requirements



From Stakeholder Needs to Product Requirements



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STAKEHOLDER NEEDS

Everyone (Marketing, Sales, Technology,...)
→ Any time using Excel interface

Stakeholder need

- Technological
- Operational
- Maintenance

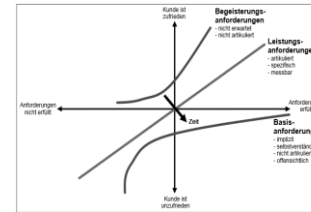
satisfy

Process Entity
e.g., E 3X

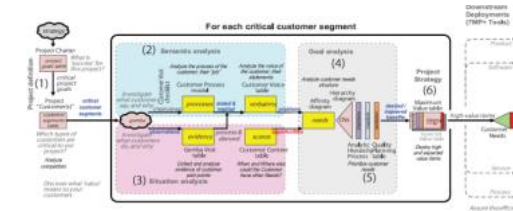
- Product Unit
- Process
- Machines
- Spinning mill

REQUIREMENTS

Product Manager together with R+D
→ Monthly exchange meeting



KANO



QFD

refine

Operational Blocks
E3X

Requirements
Use Cases

The first version of the “Digital Twin”

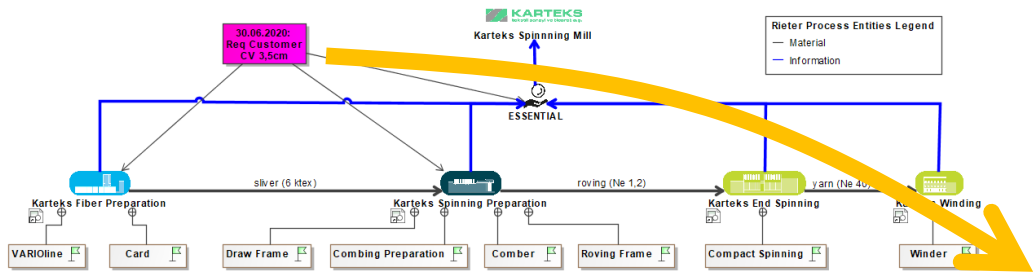


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Customer

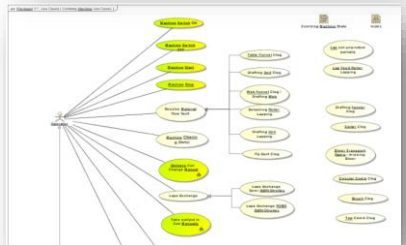


Glossary

11) [] left control unit	DE: device that regulates the side run of the lay ball during the lay production	Seitenregulierung	□ quickTerm
12) [] delivery unit	DE: Vorrichtung, welche den Materialfluss während der Materialproduktion regelt	Materialfluss	□ quickTerm
13) [] end	DE: Endpunkt der Produktion	Zufuhrpunkt	□ quickTerm
14) [] end of line	DE: Endpunkt der Produktion	Antriebsvorrichtung	□ quickTerm
15) [] end of line	DE: Endpunkt der Produktion	Antriebsvorrichtung	□ quickTerm
16) [] end of line	DE: Endpunkt der Produktion	Antriebsvorrichtung	□ quickTerm
17) [] end of line	DE: Endpunkt der Produktion	Antriebsvorrichtung	□ quickTerm

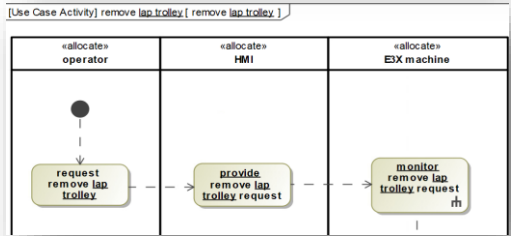
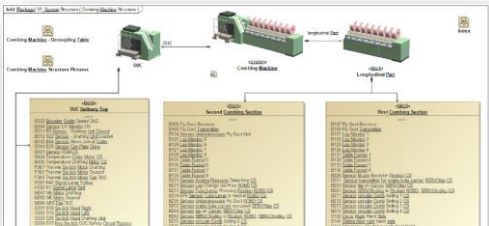
Requirement

Req. ID	Req. Description	Req. Status	Req. Category
1	Requirement 1	Open	Functional
2	Requirement 2	Open	Functional
3	Requirement 3	Open	Functional
4	Requirement 4	Open	Functional
5	Requirement 5	Open	Functional
6	Requirement 6	Open	Functional
7	Requirement 7	Open	Functional
8	Requirement 8	Open	Functional
9	Requirement 9	Open	Functional
10	Requirement 10	Open	Functional
11	Requirement 11	Open	Functional
12	Requirement 12	Open	Functional
13	Requirement 13	Open	Functional
14	Requirement 14	Open	Functional
15	Requirement 15	Open	Functional
16	Requirement 16	Open	Functional
17	Requirement 17	Open	Functional
18	Requirement 18	Open	Functional
19	Requirement 19	Open	Functional
20	Requirement 20	Open	Functional



Use Cases

Structure



Activities

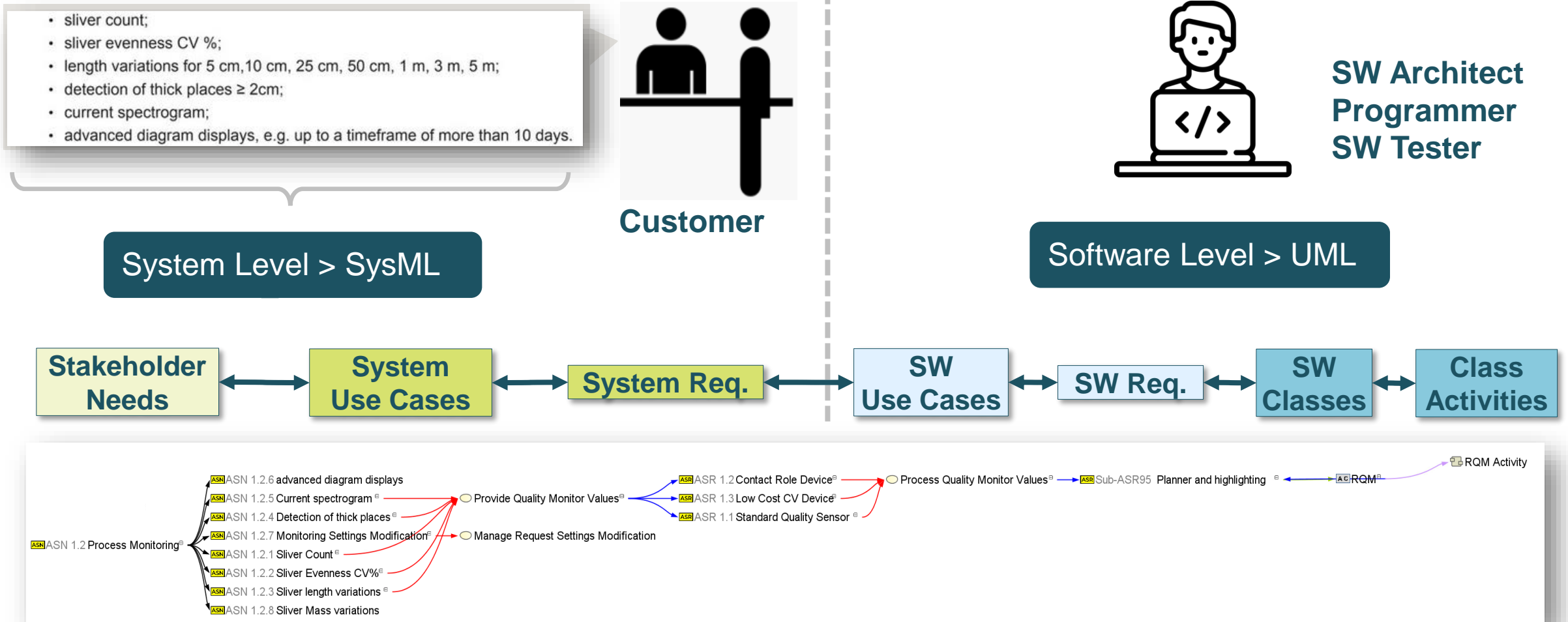
Example: Rieter Quality Monitor



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Traceability of Requirements



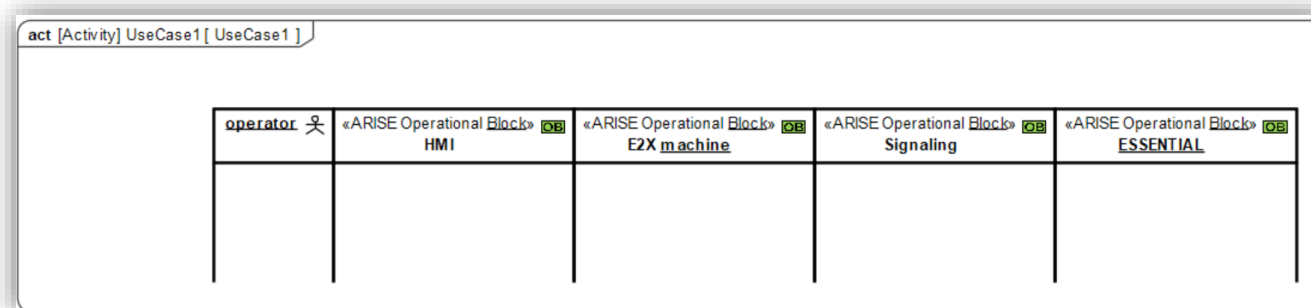
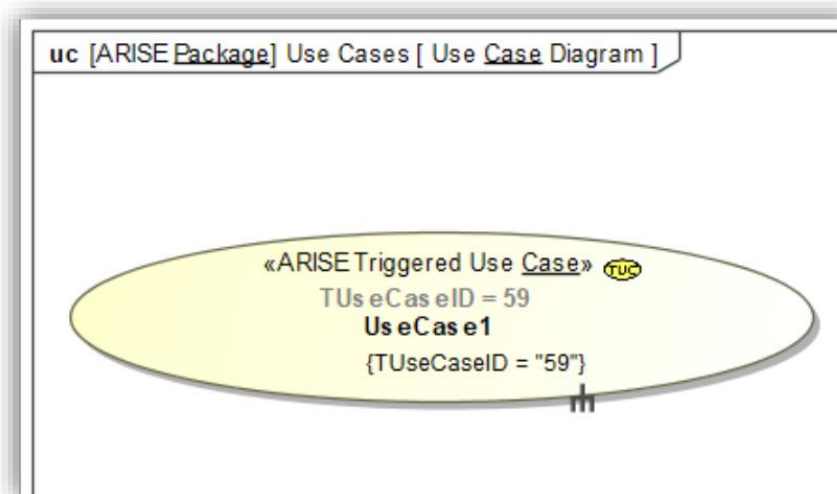
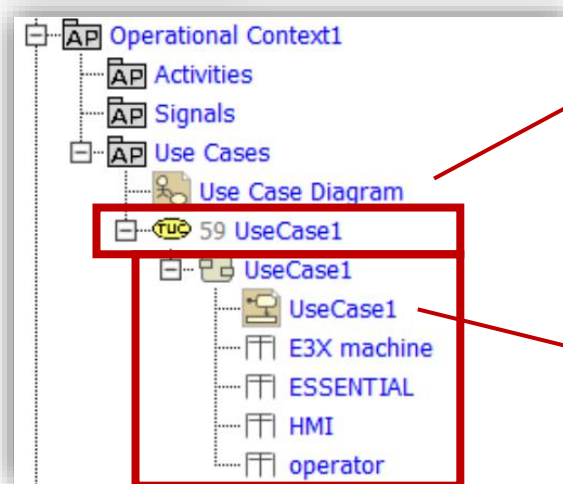
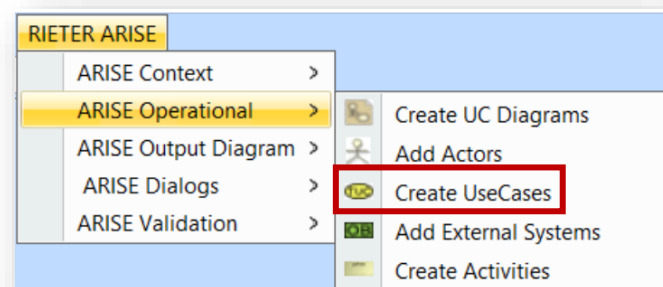
No ONE best MBSE Tool



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> Customized plugins to reduce modelling effort, towards the **One-Click** Concept



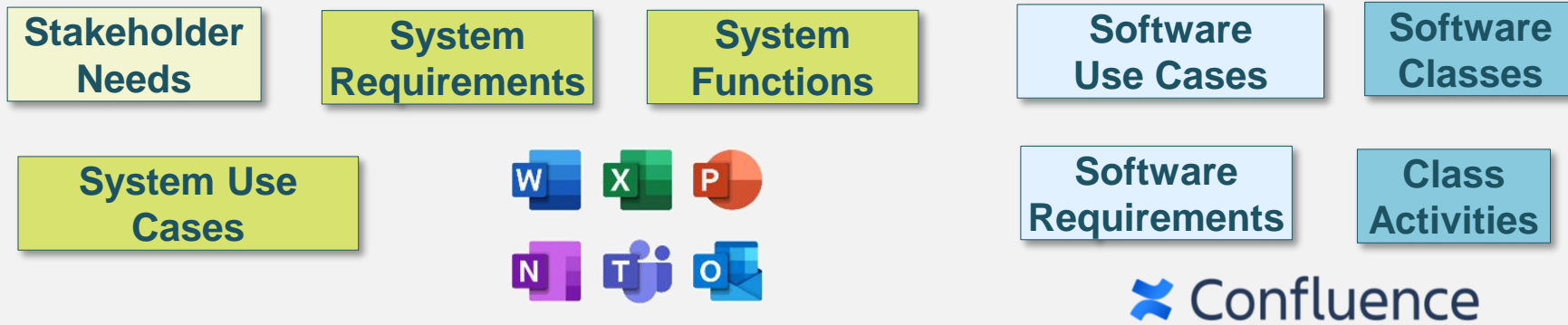
Debate > With or without MBSE?



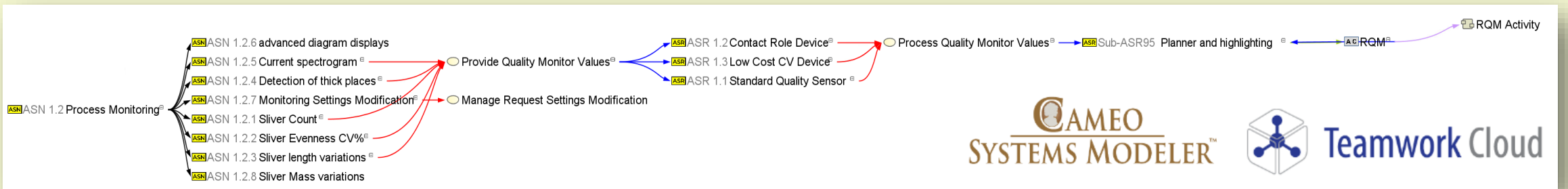
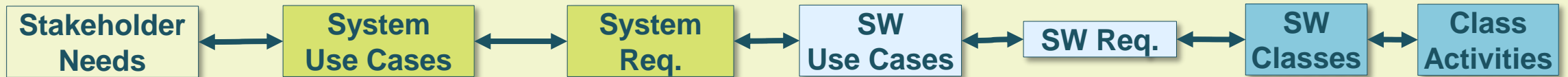
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WITHOUT MBSE



WITH MBSE



CAMEO
SYSTEMS MODELER™



Teamwork Cloud

Lessons Learned and Way Forward



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1. Keep an MBSE **Simple** option on the table
2. Keep eye on how much MBSE is **costing** you
3. Don't miss the **personnel** as part of the MBSE solution

CONFIGURABLE MBSE SOLUTION

SIMPLIFY YOUR MBSE APPROACH TO
THE POINT WHERE IT CAN BE
UNDERSTOOD OVER A CUP OF COFFEE

