Supply Chain Capability Assessment

Webinar

Agenda

1. Who we are
2. Motivation
3. Industry 4.0 Maturity Index
4. Supply Chain Capability Assessment - Example
5. Deriving Fields of Action
6. Q&A Session

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1	**Who we are**
2	**Motivation**
3	**Industry 4.0 Maturity Index**
4	**Supply Chain Capability Assessment - Example**
5	**Deriving Fields of Action**
6	**Q&A Session**

Who we are

Experts in Supply Chain Management and Production Management at the RWTH Aachen Campus

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Professional technology and market information provider founded 2012 as a spin-off of the Fraunhofer IPT

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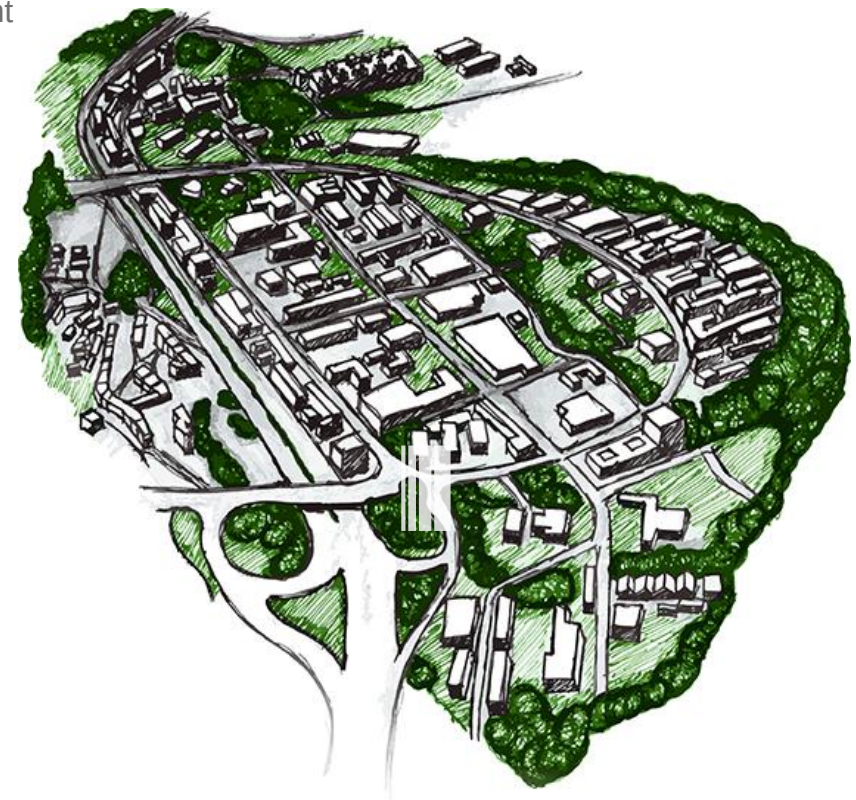

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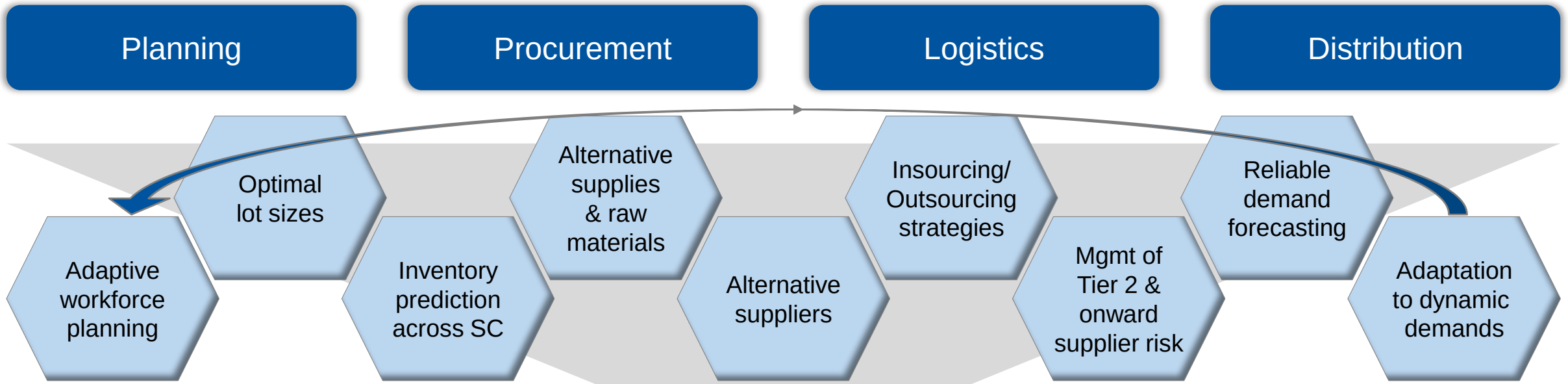
Many challenges, even more solutions



Advanced Robotics
for adaptive and scalable automation

Digital SC Twin
Modeling of end-to-end processes with improved connectivity & predictability

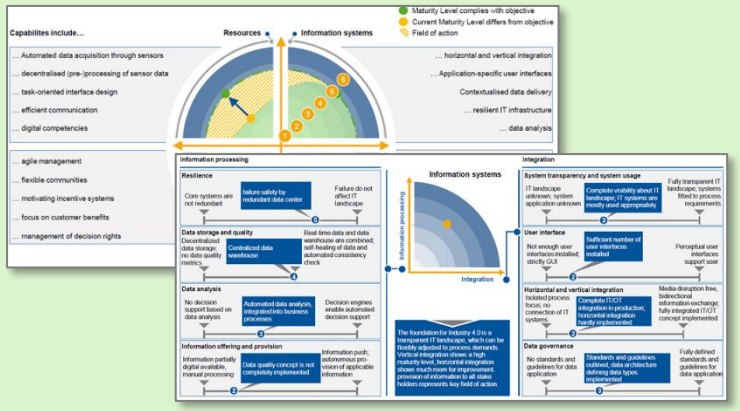
Web Crawler & Classifier
for automated supplier generation

Digital Platforms
secure inventory & asset capacity tracking

Artificial Intelligence
for pattern recognition & scenario simulation

Approach

Status quo analysis

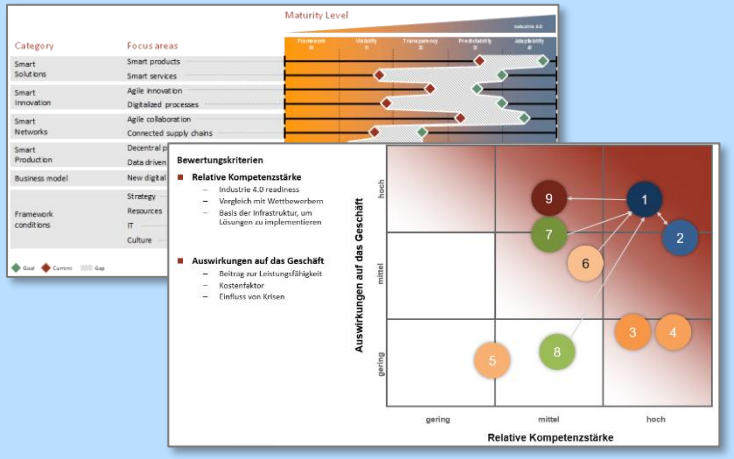


Find out your current status

&

Compare it to others

Prioritization

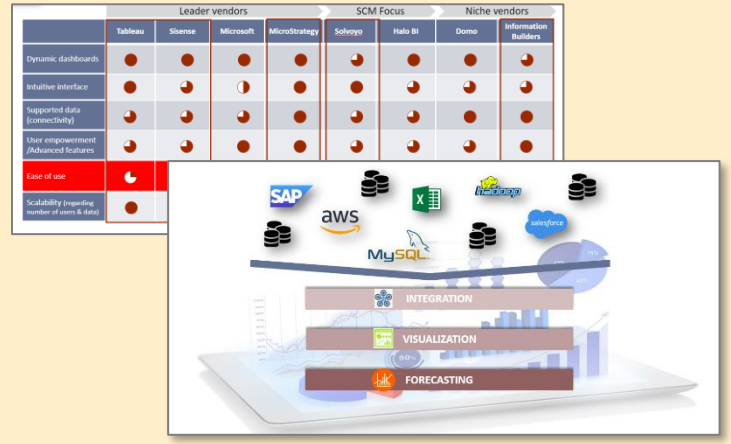


Define short-term goals

&

Define your long-term strategy

Roadmap & pilot projects



Get inspiration from best practices

&

See what state of the art solution provider are offering

„Companies that shifted - or even grew - R & D spending in the last crisis created more shareholder value“

BCG article "Tomorrow’s Innovation Leaders Are Made Today“, 13th of April 2020
(Research before and after the crisis in 2009)

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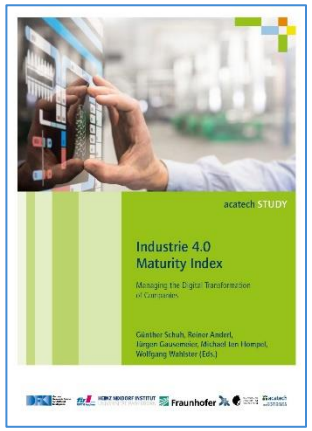
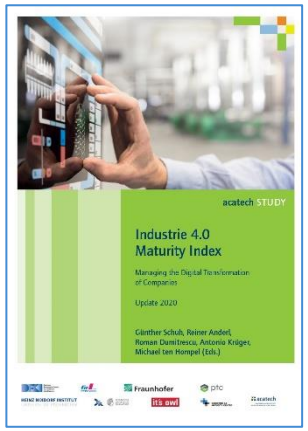
The acatech I4.0 Maturity Index is a Management Framework that enables companies to shape their Industrie 4.0 initiative

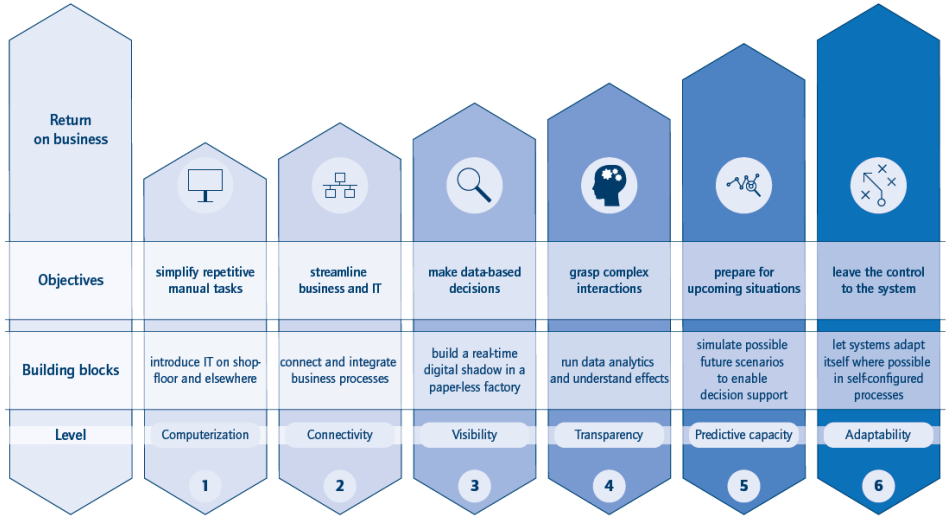
Methodology | **Industrie 4.0 Maturity Index** | Application

2017

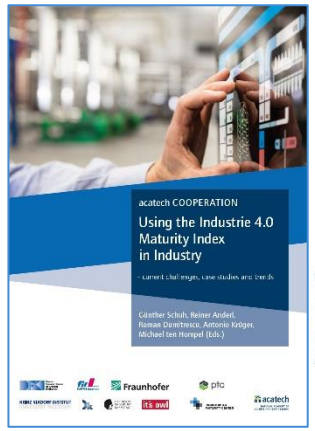


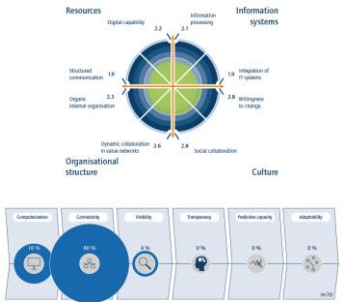
2020





2020





acatech STUDY

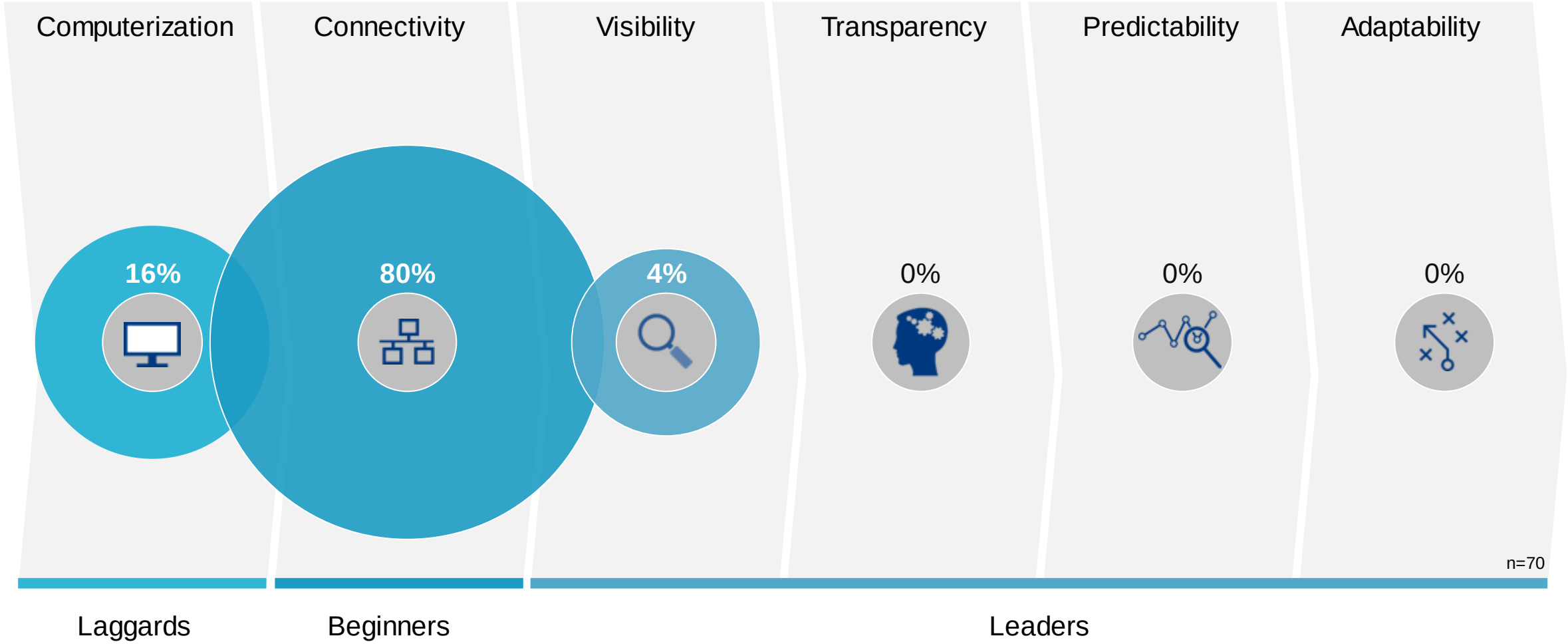
Find all publications on our website:

i40mc.de

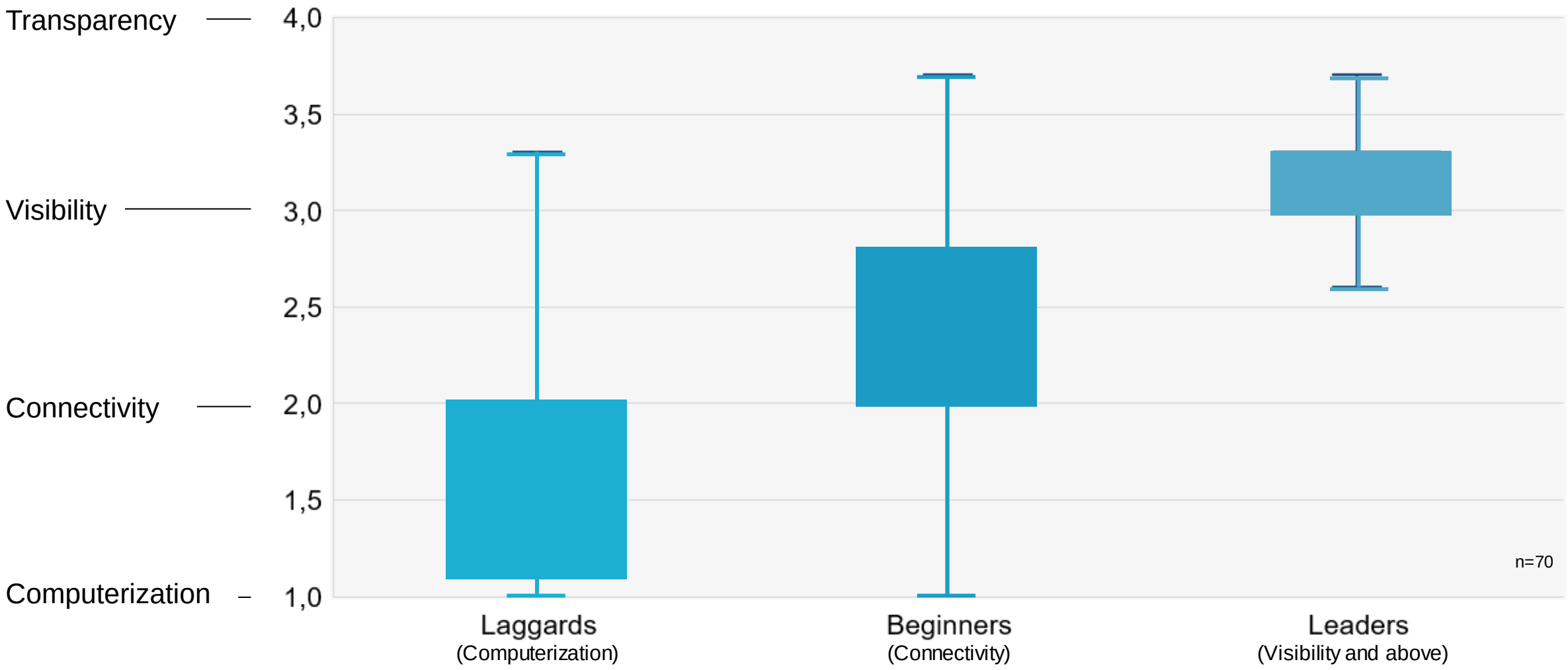
acatech COOPERATION

- Knowledge from 70 projects
- In-depth case studies
- Trends & next steps

80% of companies made first steps towards connecting machines, systems and people in real-time



Leaders have developed all Industrie 4.0 capabilities to a high maturity level



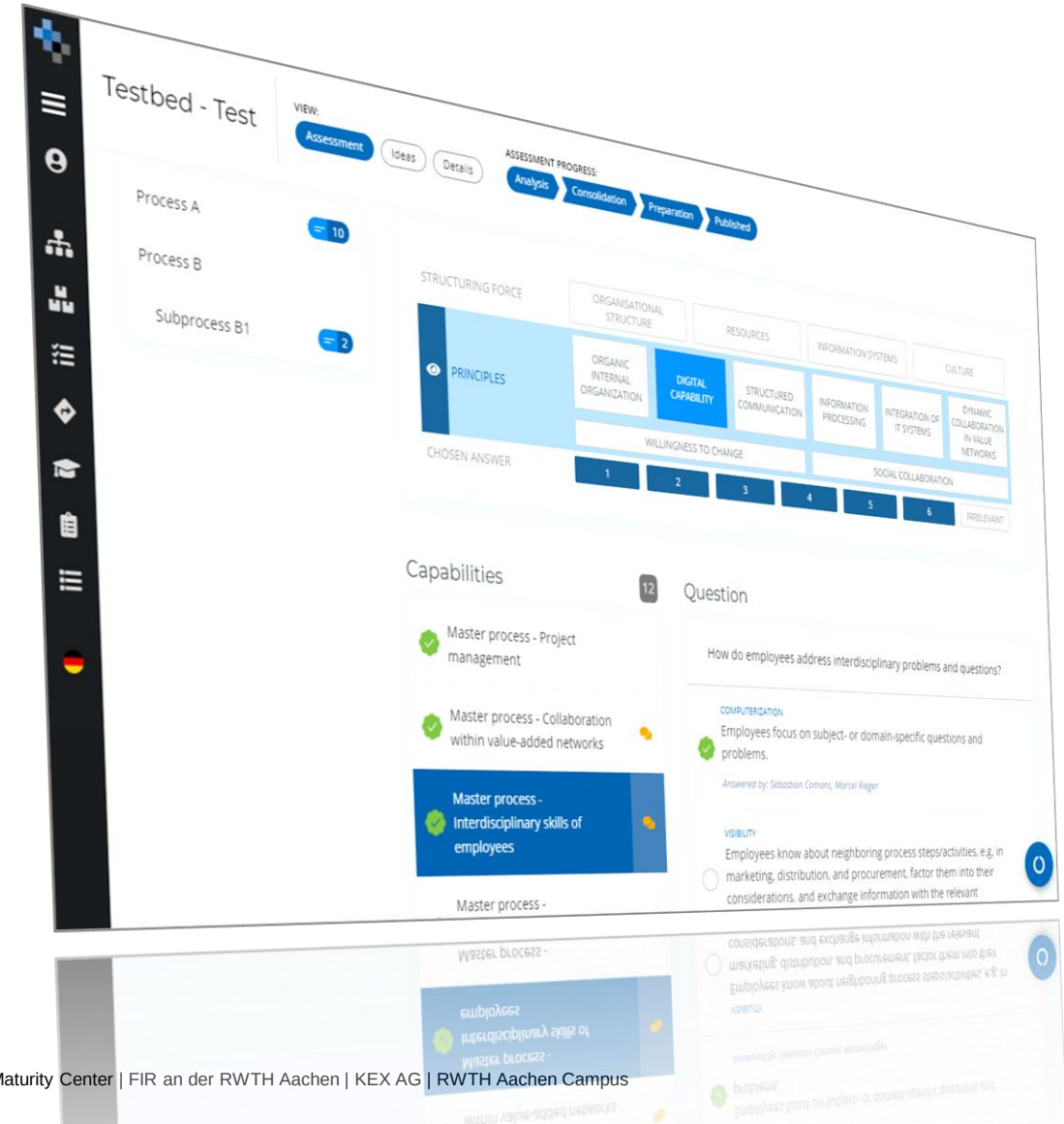
Leveraging Industrie 4.0 at Scale
A Case study with ZF Friedrichshafen AG

INDUSTRIE 4.0 MATURITY CENTER
fir an der RWTH Aachen
KEX. Knowledge Exchange®

- Set-up of a system house that coordinates all Industrie 4.0 activities across divisions in ZF's 220 plants worldwide.
- The Industrie 4.0 Maturity Index is used to develop tailored roadmaps for plants and to exploit synergies at high pace.

ZF

Our online platform provides access to the latest questionnaire



- Access up-to-date questionnaire in English and German
- Manage projects and assessments directly on the platform, assign specific choice of questions to assessment
- Assign team members to the different assessments
- All assessment data is gathered collectively
- Data are secured by user registration
- Safety precautions are held always state-of-the-art to prevent any damage

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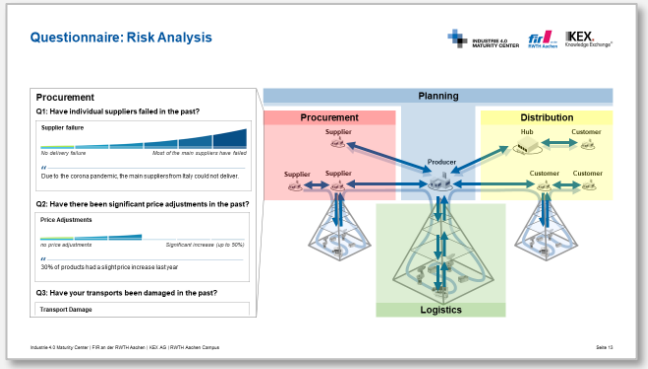
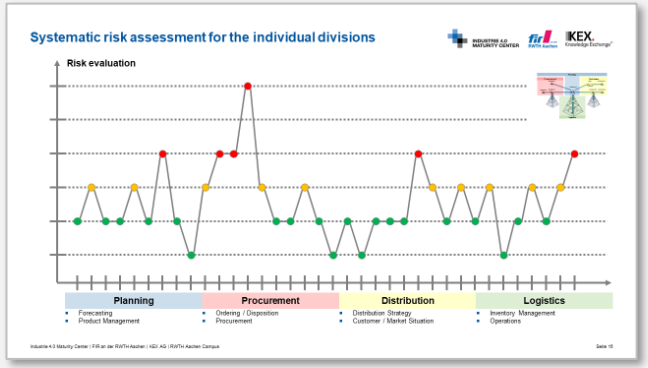
Derive targeted measures and an individual roadmap to realize uncovered and hidden potentials

Using a risk analysis, weak points and potential uncertainties in the supply chain can be identified and highlighted.

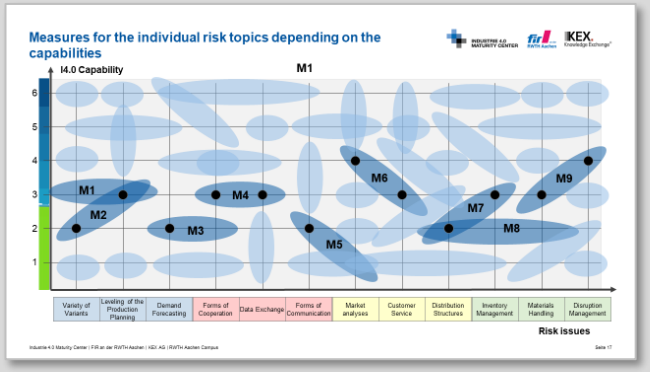
Supply Chain Risks

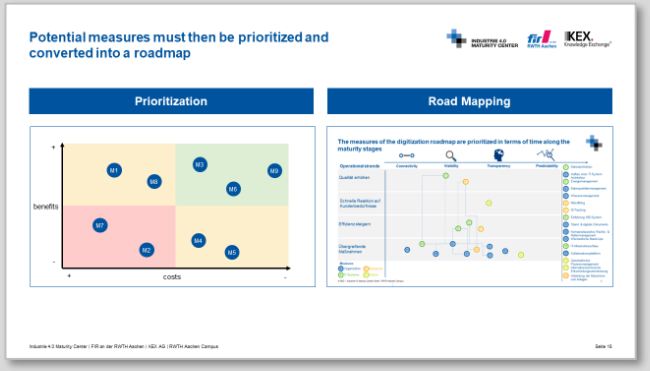




Based on the status quo and the risks, individualized measures can be derived, prioritized and arranged for individual requirements.

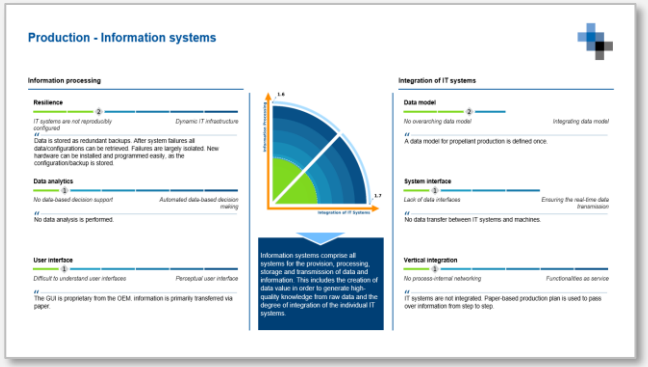
Deriving Fields of Action

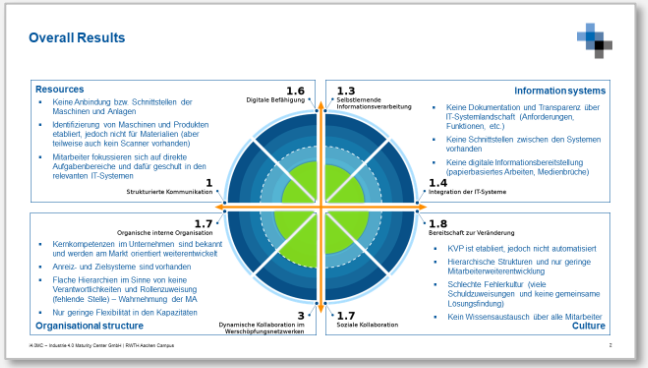




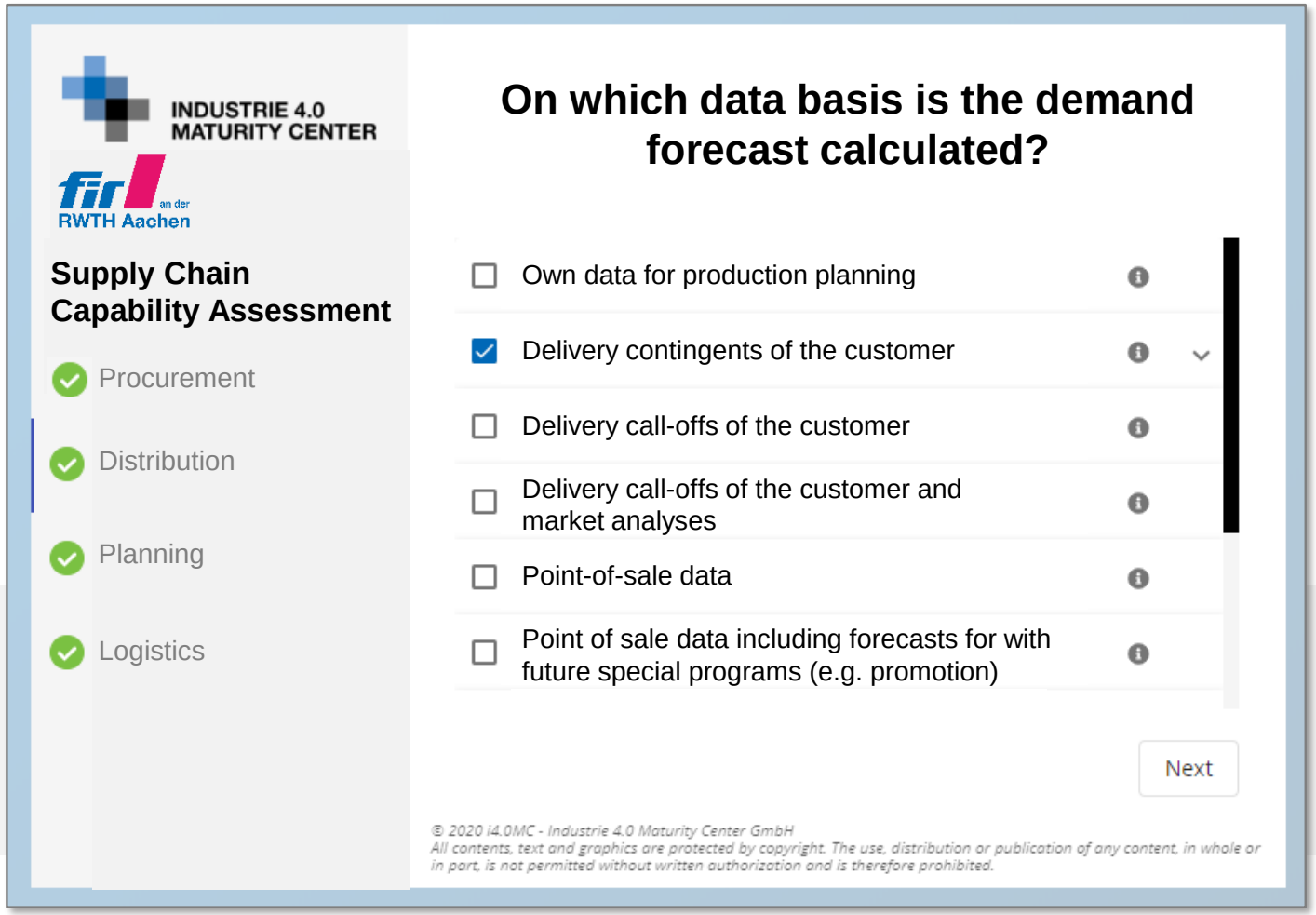
The I.40 capability query shows the status quo in an holistic manner. Both, gaps and potentials can be revealed.

I4.0 Capability Analysis





The online tool kicks off with a prequestionnaire requesting pain points, activities and goals



During the processing of the questions, our **experts support you** with **detailed explanations** of the questions, practical examples and experience of many projects.

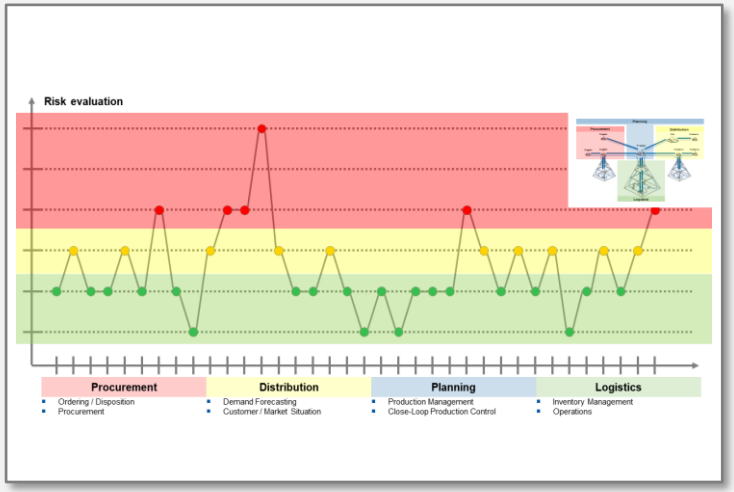
Company ABC GmbH needed to challenge demand forecasting

Company ABC GmbH

Profile:

- Manufacturing company
- < 1,000 employees
- € 580 million revenue

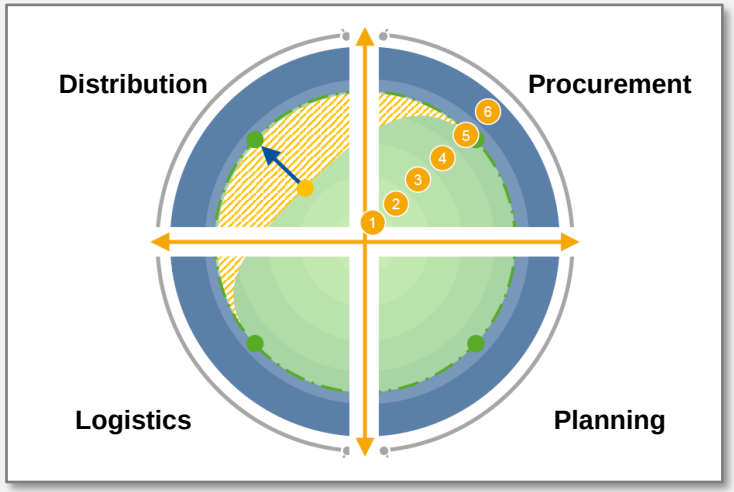
Supply Chain Risks



Main risks:

- Demand forecast (especially in disruptive times)
- Adaption of demand changes (long periods between updates)
- Focus on particular customers (strong dependencies)

I4.0 Capability Analysis



Results (extract)

- Decentralised IT systems and lack of AI-specific expertise, particularly in the area of "distribution" (level 1)
- Strong performance in “planning” (level 3) due to flexible automation with a good connectivity along the supply chain

One of the main challenges is demand forecasting, which must be improved.

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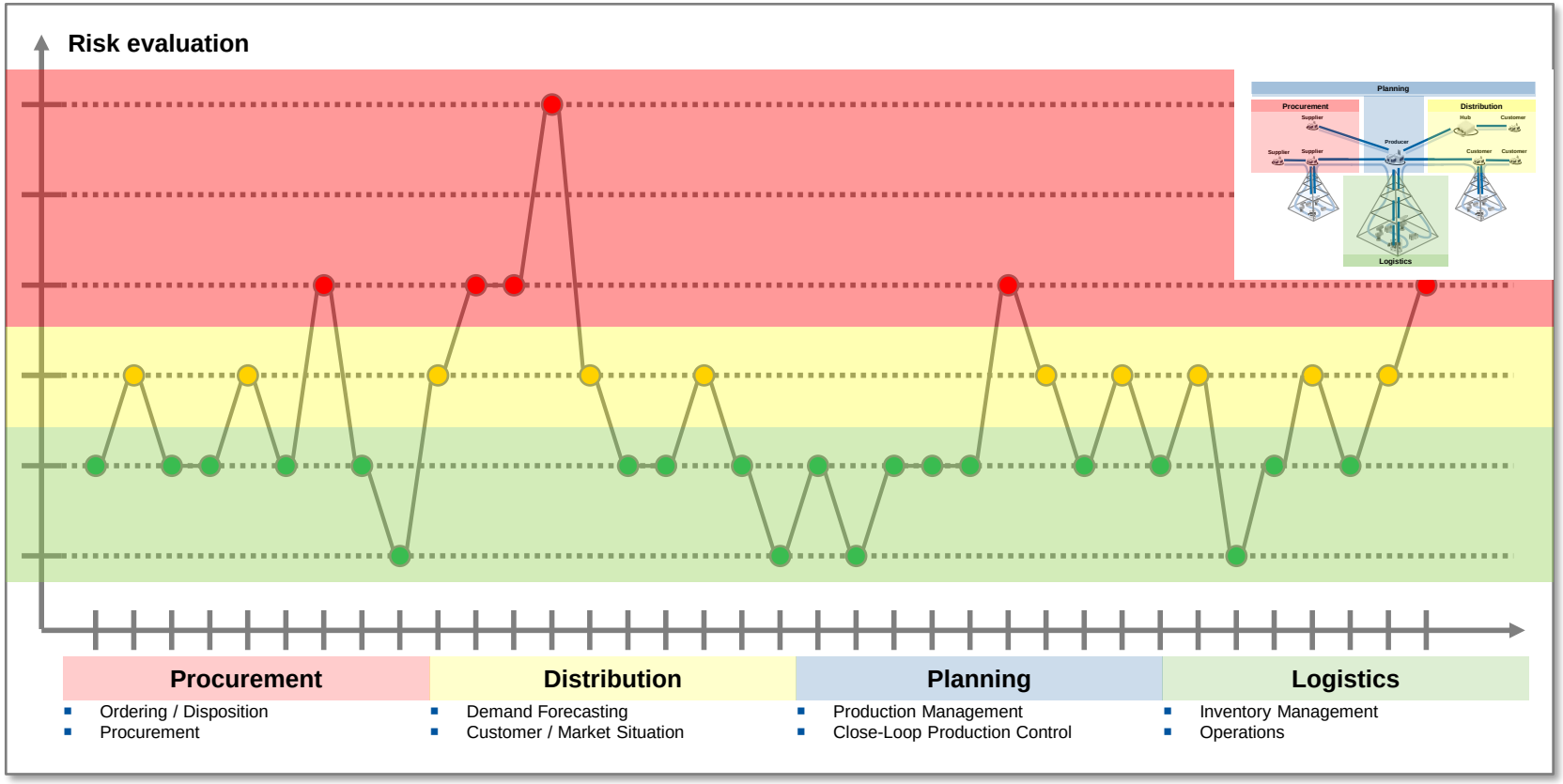
Derivation of the risk factors through the systematic evaluation of the SC risk assessment for individual decisions



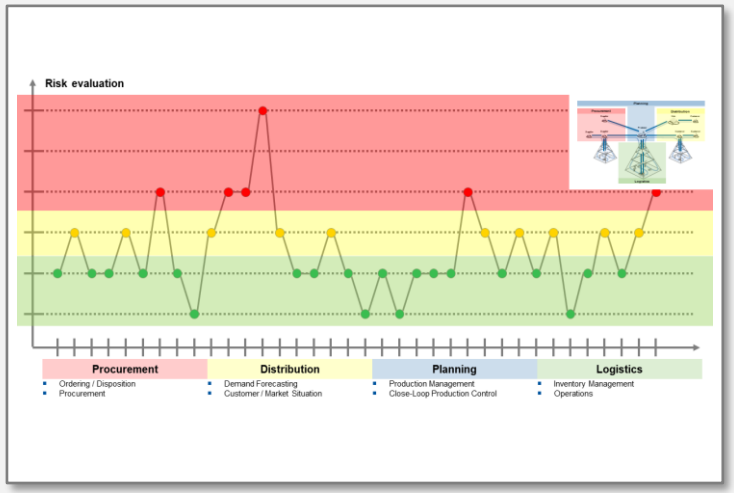
Derivation of risk factors from the supply chain risk questionnaire

Potential risk factors that are not the top priority but should be monitored

No potential risk factors

Company ABC GmbH needed to challenge demand forecasting

Supply Chain Risks



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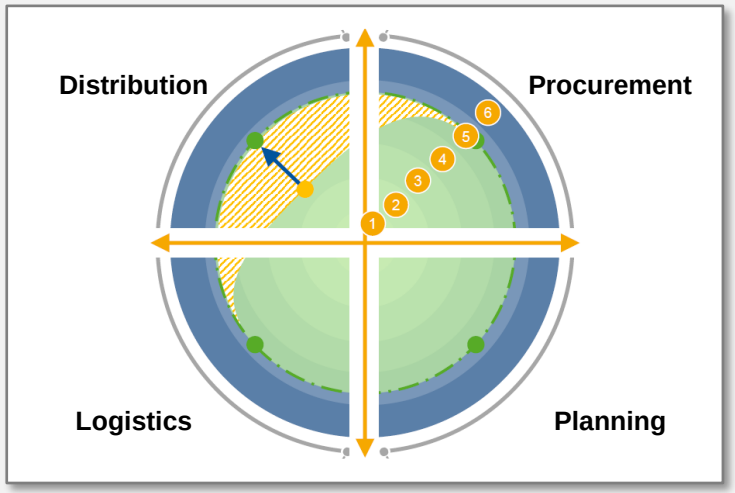


Results (extract)

- Decentralised IT systems and lack of AI-specific expertise, particularly in the area of "distribution" (level 1)
- Strong performance in “planning” (level 3) due to flexible automation with a good connectivity along the supply chain

Short-term solution:

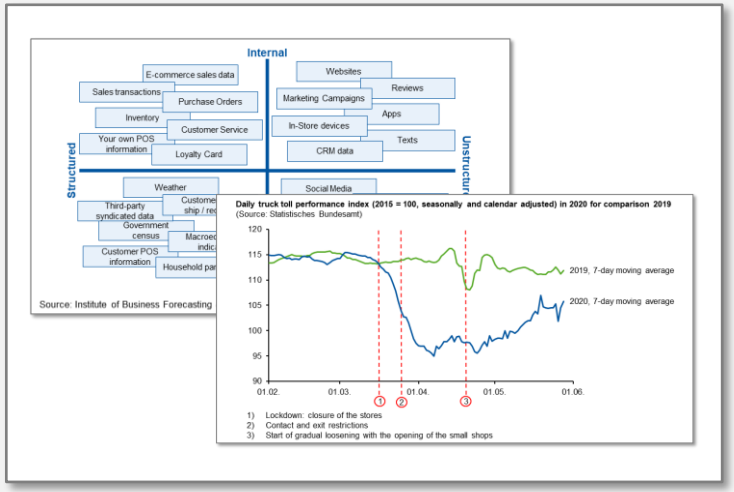
As there is no experience in the basic technologies for improved forecasting methods, but a high flexibility in the production the uncertainty of the forecast should be handled by reducing the forecast horizon and reacting more flexible in the production.

Long-term solution:

For the next crisis the area of distribution must be addressed as there is a lack of technologies to be prepared for the future.

There are various approaches for demand forecasting, but they have to match with the I4.0 capability

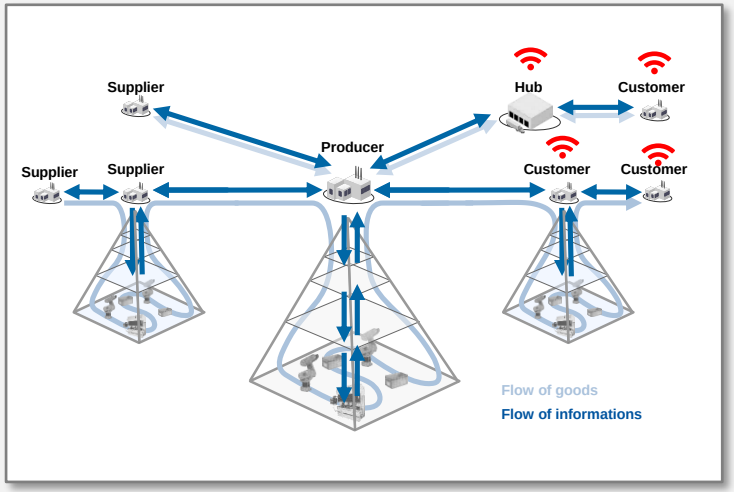
Demand Forecasting Methods



Classical demand forecasting methods (only useful with further data)

Complex AI algorithms for disruptive times

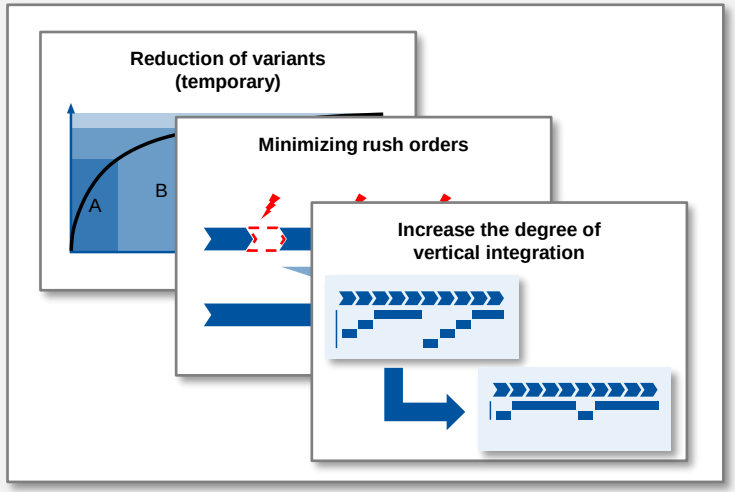
Supply Chain Cooperation



Increased communication with customers (understanding & feedback)

Improved Data exchange (e.g. point of sale data)

Adoption of Production Planning



Temporary reduction of variants

Prioritization rush orders

Increase the degree of vertical integration

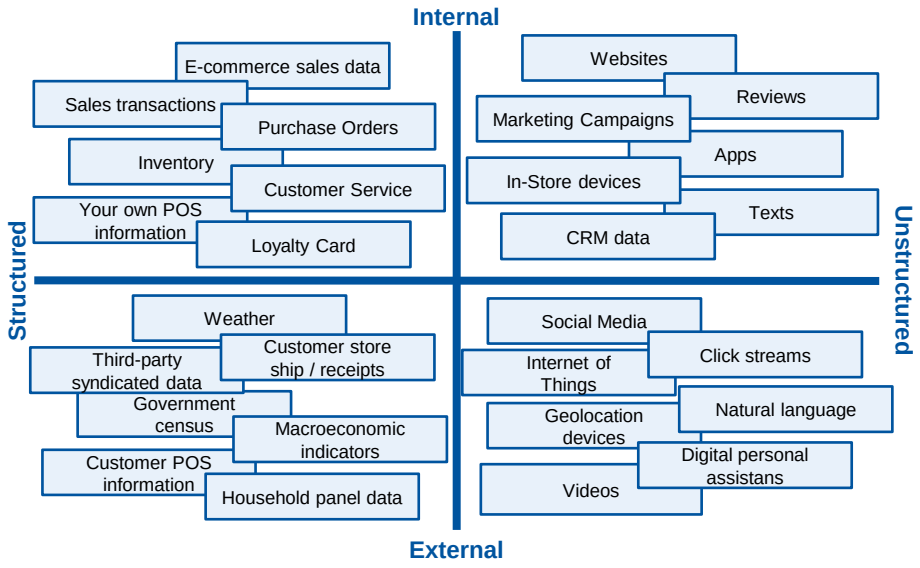
Each measure has a minimum and required level regarding the I4.0 capability.

Demand can be forecasted even in disruptive times using complex AI algorithms

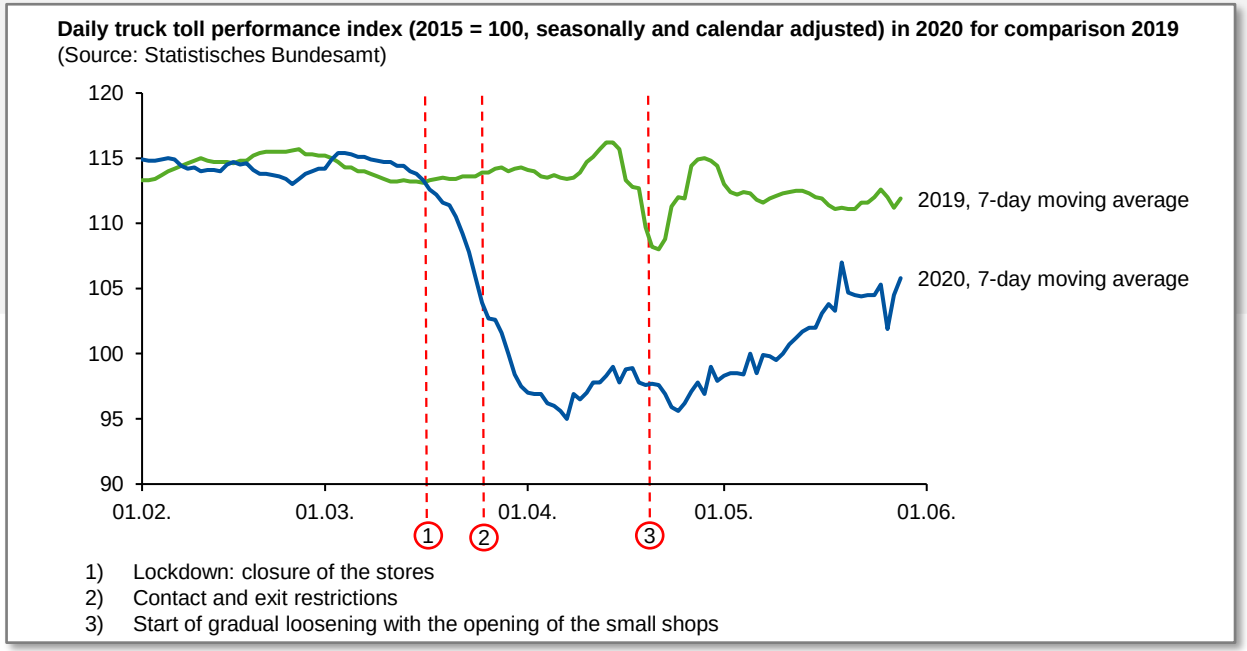
For demand forecasting in distruptive times it is necessary to enrich the own data with **external data sources:**

- **Structured data** (economic indices, mobility analyses, etc.),
- **Unstructured data** (press releases, search queries, etc.)

Such approaches are particularly successful with **B2C companies.**



Source: Institute of Business Forecasting & Planning

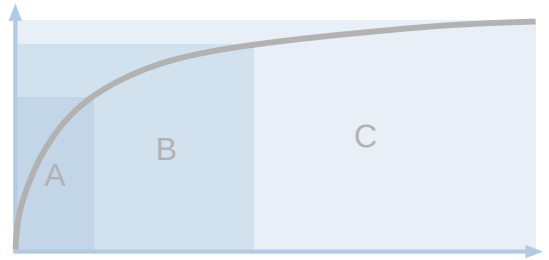


Minimum I4.0 Capability: Data Processing Experience (at least level 4)

Such solutions were not used for the company, as **the data processing capabilities**, especially AI approaches, **are not sufficient.**

Measures for production planning to improve the response to changing demand

Reduction of variants (temporary)

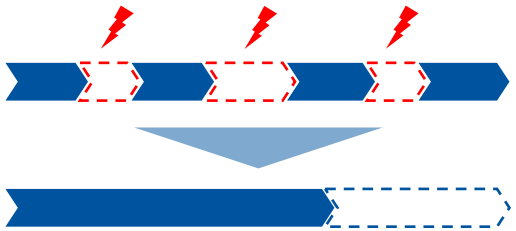


Focusing on main variants can lead to enhanced capacity utilization

Minimum I4.0 Capability:
-

Recommended I4.0 Capability:
System-based simulation software

Prioritization rush orders

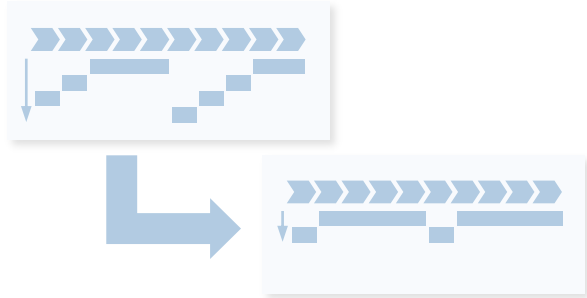


Specific prioritization of rush orders

Minimum I4.0 Capability:
Production planning software

Recommended I4.0 Capability:
System-based simulation software

Increase the degree of vertical integration

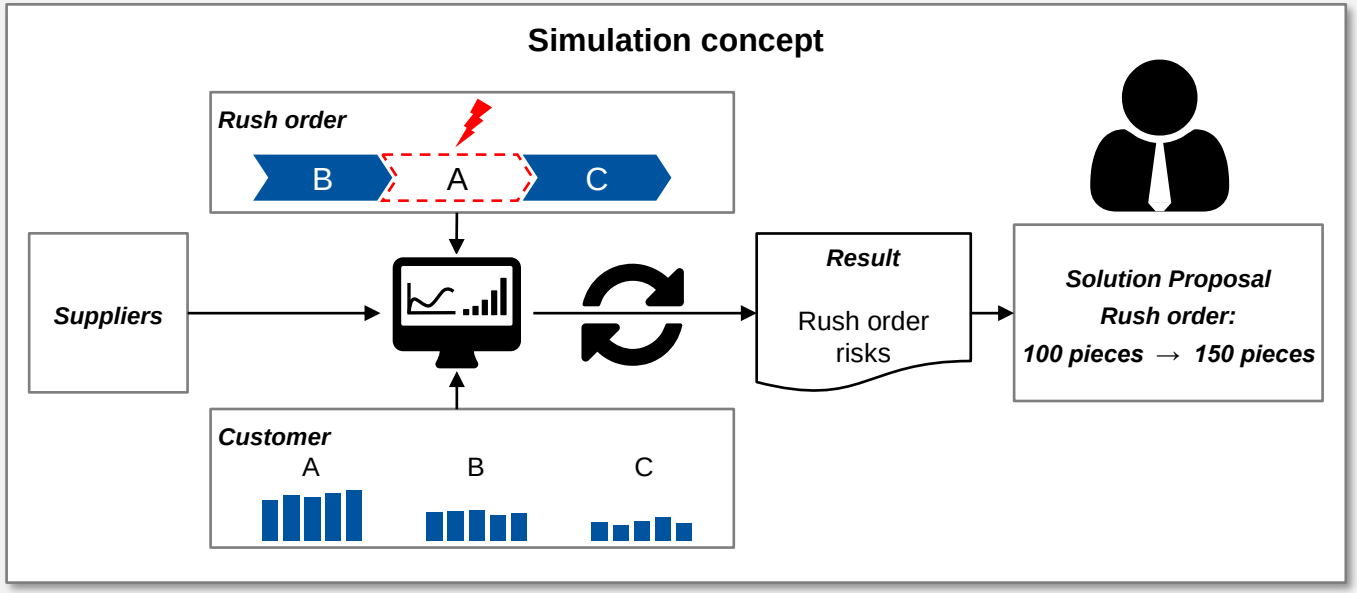


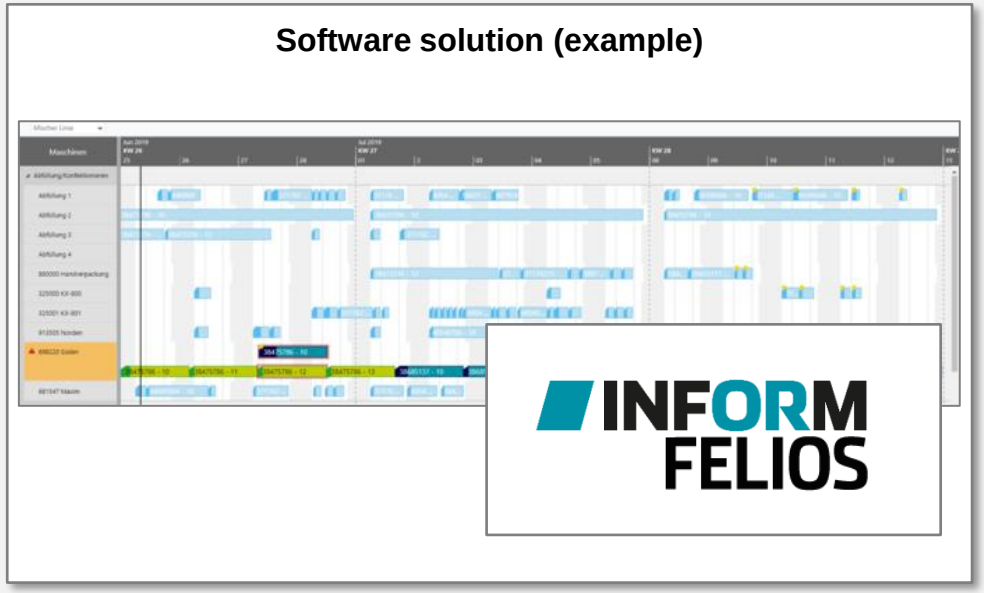
Reduces dependency on suppliers and the negative effects

Minimum I4.0 Capability:
Manufacturing execution system

Recommended I4.0 Capability:
Manufacturing execution system

The usage of system-based simulation software can support the reduction of variants and the prioritization of rush orders





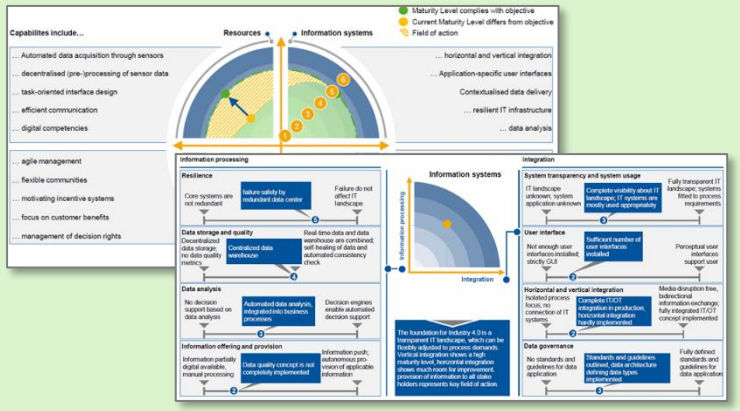
Time perspective, **suppliers** and **order values by customers** need to be taken into account.

The simulation enables the user to **asses the rush orders risks** and **to propose solutions to compensate** the risk, e.g. by increasing the order volume.

Advanced Planning and Scheduling (APS) System to assess the **consequences of rush orders.**

Approach

Status quo analysis



Find out your current status

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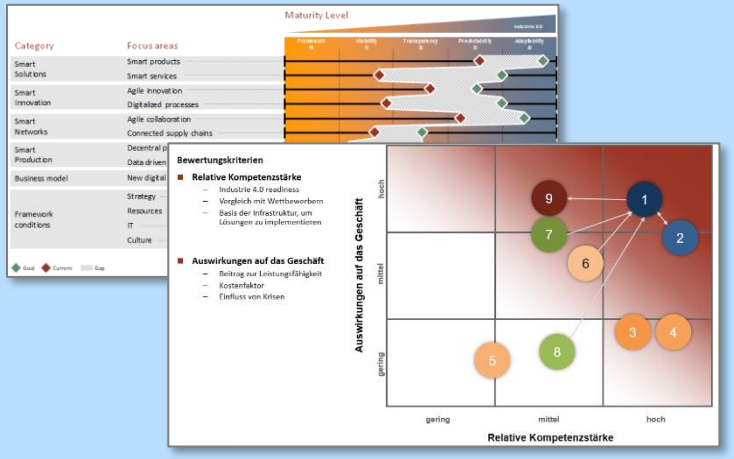
Compare it to others

Prioritization



Define short-term goals

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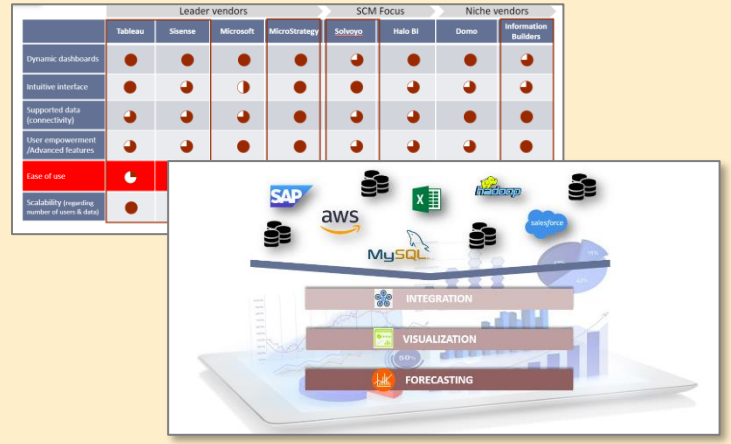
Define your long-term strategy

Roadmap & pilot projects



Get inspiration from best practices

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See what state of the art solution provider are offering

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