»Digitalization in Food & Beverage«
Production Processes and Product Enhancement

"I would be terrified if I were a consumer packaged-goods company right now. Under the old model of food retailing the brand you trusted was the manufacturer. Today you go onto Amazon and filter everything by what´s Prime."

Benzi Ronen
CEO Farmigo (food hub startup)

Start: Q3 2018
End: Q2 2019

Join the consortium to …

get an overview of **Industry 4.0** and **IoT applications** in the context of food and beverage production & product enhancement:

➢ Receive **digitalization applications** across the fields of **asset** and **supply chain management**, **process** and **quality control,** etc.

➢ Learn how data processing and advanced data analytics can help you to lower the costs for **individualization**, **quality control** and **labeling** of your products

➢ Understand fast growing **platforms** and **eco systems** and learn how to participate

➢ Make use of digitalization, develop **new business models** and offer innovative **services** to your customers

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an der
RWTH Aachen

execon partners
NEXT LEVEL EXECUTION

WZL | RWTH AACHEN UNIVERSITY

Digitalization in Food & Beverage
Motivation

Initial Situation	**Digitalization, individualization and sophisticated data analytics** are major trends affecting the food & beverage sector through the change of customer needs and preferences, product requirements and advancement of processing methods. The main questions of involved companies concerning this subject are: ▪ What will be the leading applications that will drive smart technologies in food & beverage? ▪ Which benefits can be assumed from smart production, assets or services? ▪ Which technologies in terms of sensors, network technologies and data analytics can be applied for specific problems?
Major Outcome for Participants	➔ **A detailed overview about smart applications and enabling technologies for smart production processes, smart production assets and smart services** ➔ **Technological and economic transparency** ➔ **Access to a large international partner network**
Procedure	Within the project, current and future smart solutions from selectable focus areas will be identified. Cross-industry innovation patterns are extracted and applied to specific production processes, assets and services named by the consortium. Based on your vote, technology concepts and business cases will be established for the most relevant smart solutions.

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Digitalization in Food & Beverage
Trends affecting the industries

- Conscious Food Consumption
- Health & Well-Being
- Rules & Regulations
- Distinction
- Fair Trade
- Personalized Products
- Food Safety
- Convenience Foods
- Omni-Channel Retailing
- Climate Change
- E-Commerce
- …
- Urban Farming

Digitalization in Food & Beverage
Excerpt of Relevant Topics

Smart Equipment
- Retrofitting of Older Machinery
- Condition Monitoring
- Worker Support (e.g. AR[1], VR[2])
- …

Asset Management
- Predictive Maintenance
- Remote Services
- Modular Factories
- …

Logistics / SCM[3]
- Horizontal SC Integration
- SC Risk Assessment
- Item-level Traceability
- …

Production Processes
- Predictive Process Control
- Process Automation & Agility
- 3D Food Printing
- …

Quality Control
- Food Safety
- Prediction of Quality & Deviations
- Real-time Quality Control
- …

Packaging
- Sustainability
- Robotic Pick-and-Pack Systems
- Blending & Formulation
- …

Smart Labels
- Interactive Labels
- Serialization
- Intelligent Labels
- …

Business Processes
- E-Commerce & Omni-Channel
- Sales Forecasting
- Blockchain
- …

Product Individualization
- Customized Content
- Customized Labels
- Customized Packaging
- …

[1]AR: Augmented Reality
[2]VR: Virtual Reality
[3]SCM: Supply Chain Management

Digitalization in Food & Beverage
Focused Industries

Food & Beverage Processing

Food processing Equipment

Food Additives

Farming & Agriculture

Food Service
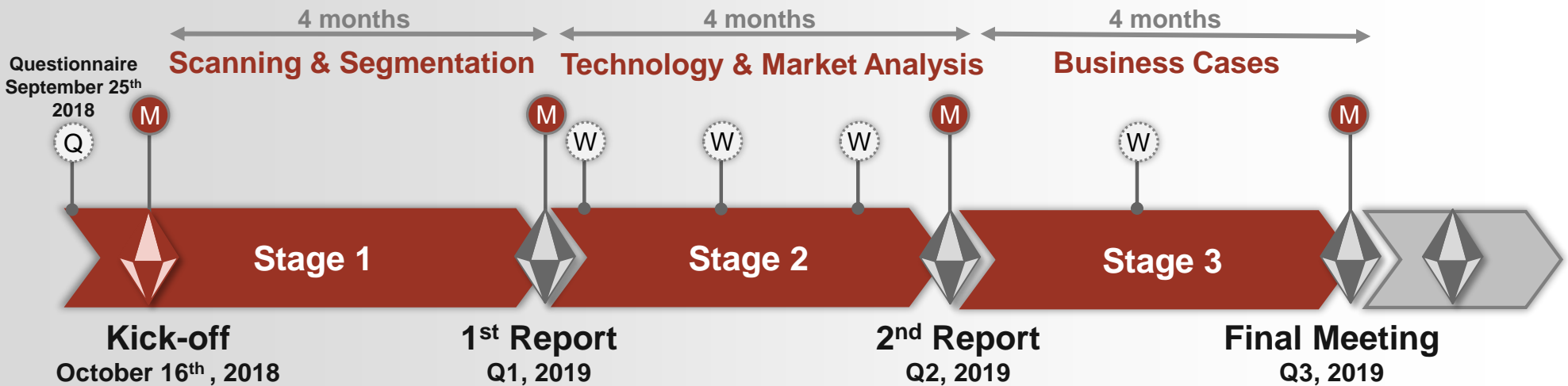

Food Supplements

Packaging & Labeling

Food Products Supply Chain

Retail & E-Commerce

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Digitalization in Food & Beverage
Project Timeline

1 2 3

4 months — **Scanning & Segmentation**
4 months — **Technology & Market Analysis**
4 months — **Business Cases**

Questionnaire September 25th 2018
Q
M

M W W W M W M

Stage 1   **Stage 2**   **Stage 3**

Kick-off
October 16th , 2018

1st Report
Q1, 2019

2nd Report
Q2, 2019

Final Meeting
Q3, 2019

Stage 1 Content:

- Assessment of **relevant market trends** and consortium **needs**
- Suggestion of **relevant segments** and sub-segments
- Scanning for **trend topics in R&D, smart applications and solutions**
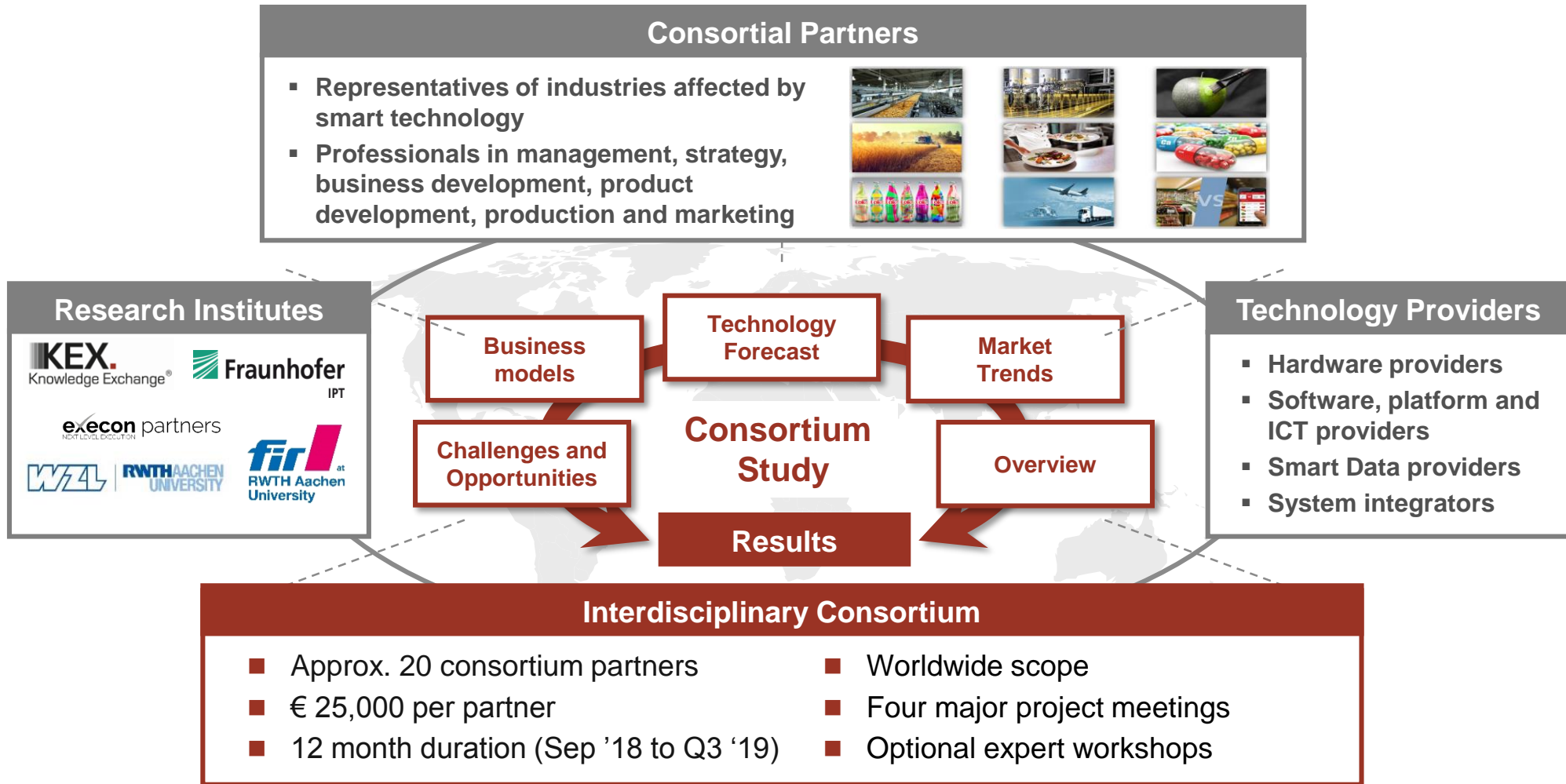- **Structured visualization, pre-evaluation**, presentation and discussion of results

Stage 2 Content:

- Systematic **selection** of the most attractive **smart applications & solutions** by the project partners
- Detailed **technology assessment** for selected applications
- Evaluation of **technological feasibility** and business potential estimation
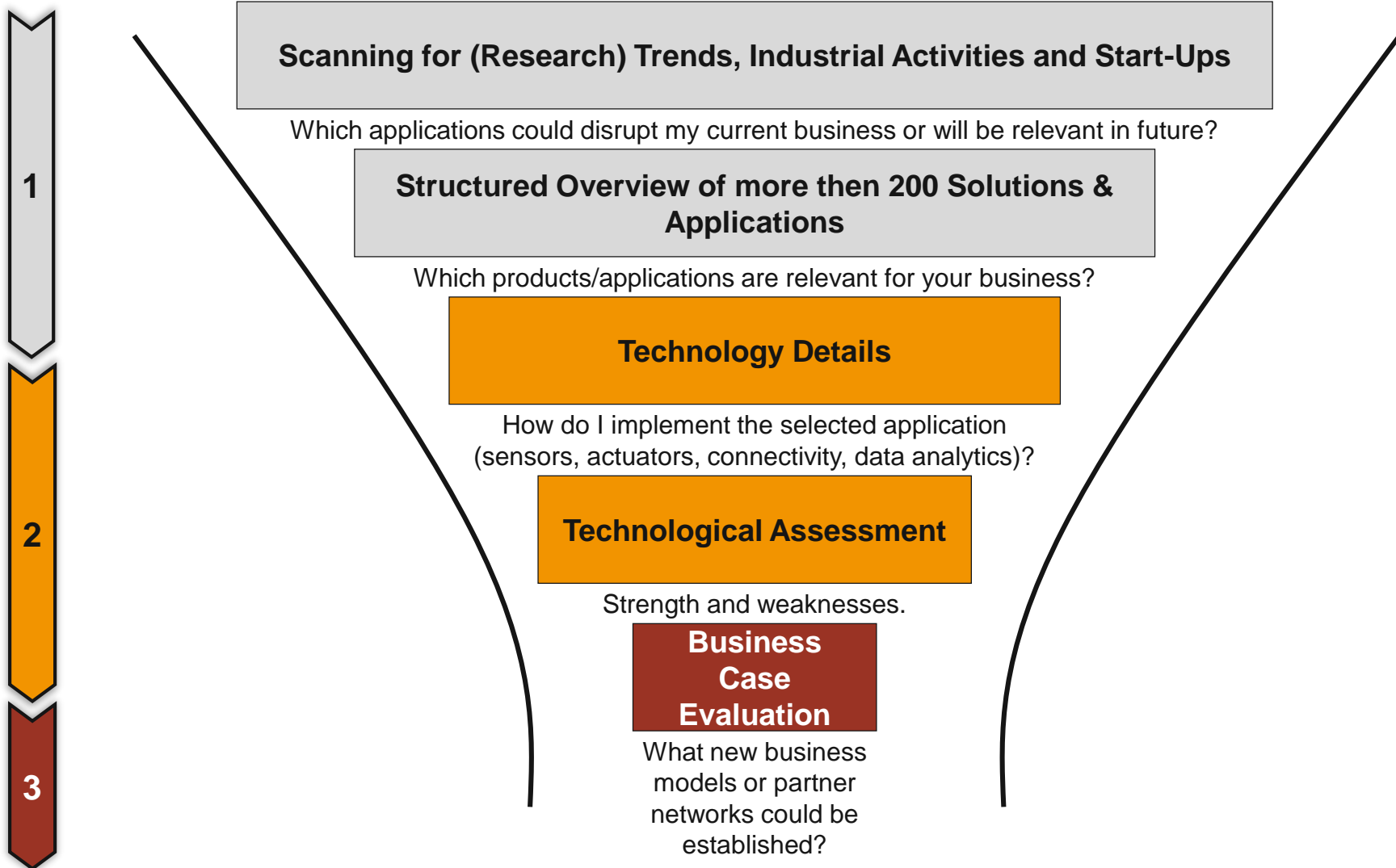
Stage 3 Content:

- Assessment of smart service potential based on **smart products** or **systems**
- Evaluation of **market opportunities**
- Assessment of potential **business models**
- Analysis of potential **added value** and **costs for implementation**
- New **business model generation** (if applicable for the selected case)
- Results of Stages 1-3 as point of contact for **partner specific roadmaps** and **use-cases**

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Q **Questionnaire**

M **Consortium meeting (taking place at KEX, Aachen)**

W **Optional workshops with partners/experts**

Seite 6
14.06.2018

Digitalization in Food & Beverage
Consortium Structure

Consortial Partners

- **Representatives of industries affected by smart technology**
- **Professionals in management, strategy, business development, product development, production and marketing**

Research Institutes

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Technology Providers

- **Hardware providers**
- **Software, platform and ICT providers**
- **Smart Data providers**
- **System integrators**

Business models

Technology Forecast

Market Trends

Challenges and Opportunities

Consortium Study

Overview

Results

Interdisciplinary Consortium

- Approx. 20 consortium partners
- € 25,000 per partner
- 12 month duration (Sep '18 to Q3 '19)
- Worldwide scope
- Four major project meetings
- Optional expert workshops

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Digitalization in Food & Beverage
Focus & Framework

1

Scanning for (Research) Trends, Industrial Activities and Start-Ups

Which applications could disrupt my current business or will be relevant in future?

Structured Overview of more then 200 Solutions & Applications

Which products/applications are relevant for your business?

Technology Details

How do I implement the selected application (sensors, actuators, connectivity, data analytics)?

2

Technological Assessment

Strength and weaknesses.

Business Case Evaluation

What new business models or partner networks could be established?

3

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Digitalization in Food & Beverage
Outcome

	What you get		**What we do**
1	A pre-evaluated, structured overview of relevant focus areas, topics and appropriate applications	Scanning for (Research) Trends, Industrial Activities and Start-Ups — Which applications could disrupt my current business or will be relevant in future? / Structured Overview of more then 200 Solutions & Applications — Which products/applications are relevant for your business?	Applications/Technology scouting and evaluation taking into account trends and consortium partners needs
2	Evaluation of technological feasibility of selected applications and estimation of the business potential	Technology Details — How do I implement the selected application (sensors, actuators, connectivity, data analytics)? / Technological Assessment — Strength and weaknesses.	Technology deep dive on selected applications, detailed assessment and evaluation of strengths and weaknesses
3	Detailed overview of potential business models and service opportunities	Business Case Evaluation — What new business models or partner networks could be	Assessment of potential added value, costs for implementation and service potential

+ Networking and discussion within your business area and along the supply chain

Digitalization in Food & Beverage
Previous Consortium Partners

Consortial Project Framework:

- **Offline result generation by research partners**
- **Face-to-face results presentation** and **discussion** with industrial consortial partners
- Moderated **cross-industrial workshops** and **expert key note speeches**
- **Networking** with an **cross-industrial consortium** and **highly relevant research entities**

	Merck	...	
T-Systems	Toyota		Miele
OSRAM	Vorwerk	Thyssen Krupp	Harting
ZTE	Audi	Hilti	
Lonza	Brose	Friesland Campina	Givaudan
Daimler	**More than 200 previous Consortium Partners***	LG	...
3M	Alfred Kärcher	DSM	
...	Opel	Hitachi	
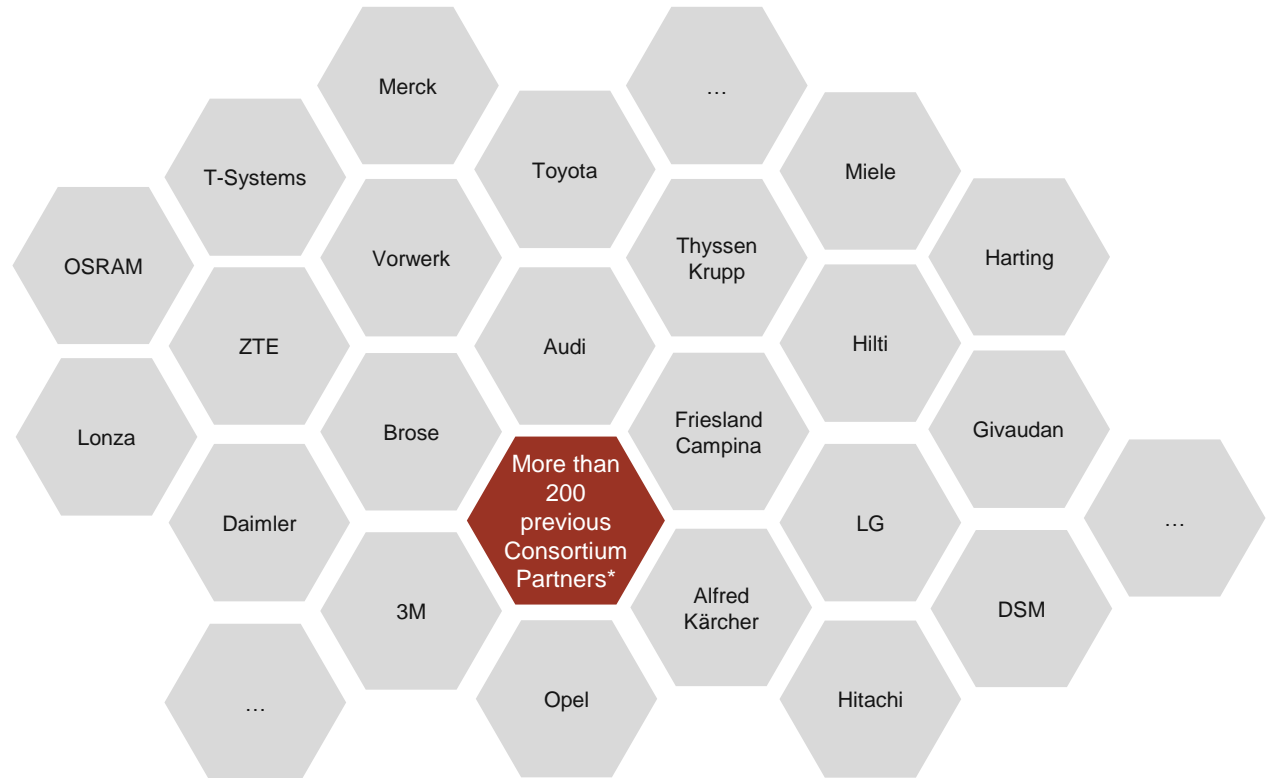
* all mentioned companies were partners of a former consortium project hosted by KEX AG
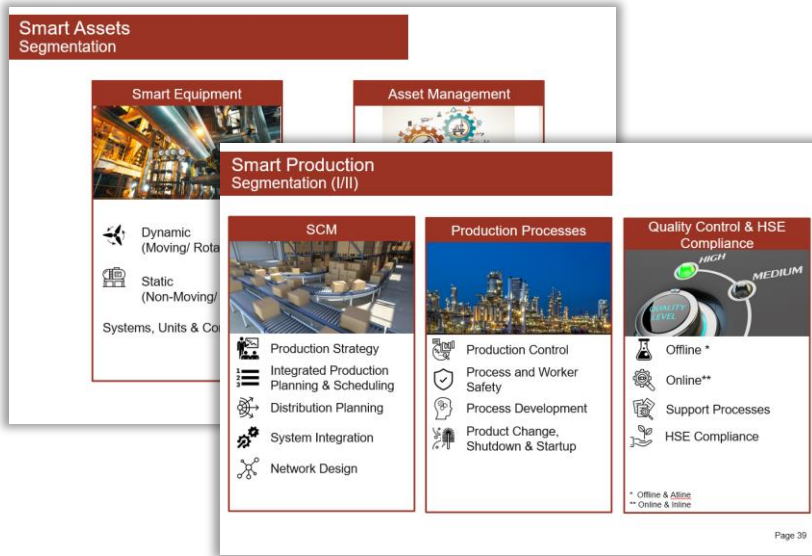
Segmentation

- Structured overview of **relevant focus areas** and sub-segments within these focus areas

- Suggestion of focus areas based on **consortium preferences** (questionnaire) and **major trends**

- High level aggregation of **market and technology intelligence** for each segment

Application Trees

- Pre-selection of the most relevant approx. **200 cross-industrial smart solutions** to be presented to the consortium during the **1st report meeting**

- Structured overview of current and future **smart solutions** in the context of **specific applications fields**

- The consortium will vote for around 10-15 smart applications / solutions to be evaluated technologically in project **Stage 2**
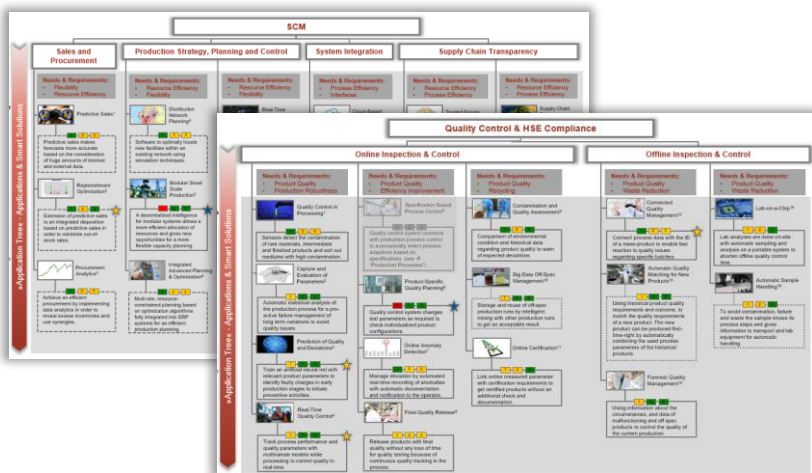
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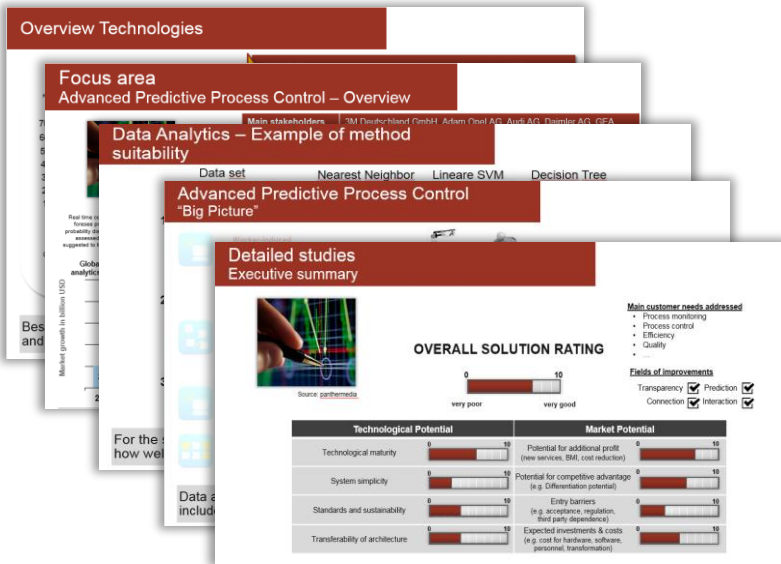
Technology Analysis

- Scouting and presentation of relevant **technologies to implement** the selected solutions

- Deep assessment of different **technological concepts** ending up in a **deep dive report**

- Evaluation and **discussion of challenges**

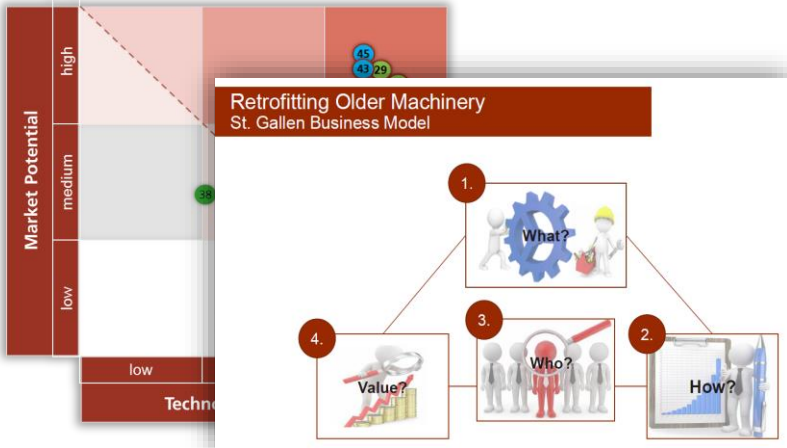- Identification of **potential technology partners**

Market Pre-Assessment

- Assessment of **expected market potential**, time-to-market and **economic competitiveness** of the selected smart solutions

- Assessment of the **potential for new Smart Services** as preparation for **project stage 3**
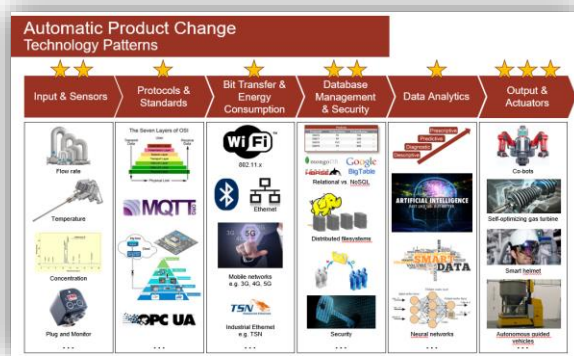
Smart Service Assessment

- Analysis of **smart service potential** based on technological solution or e.g. availability of valuable data

- Search for potential **innovative business models**

- Evaluation approach is based on Business Model of St. Gallen University
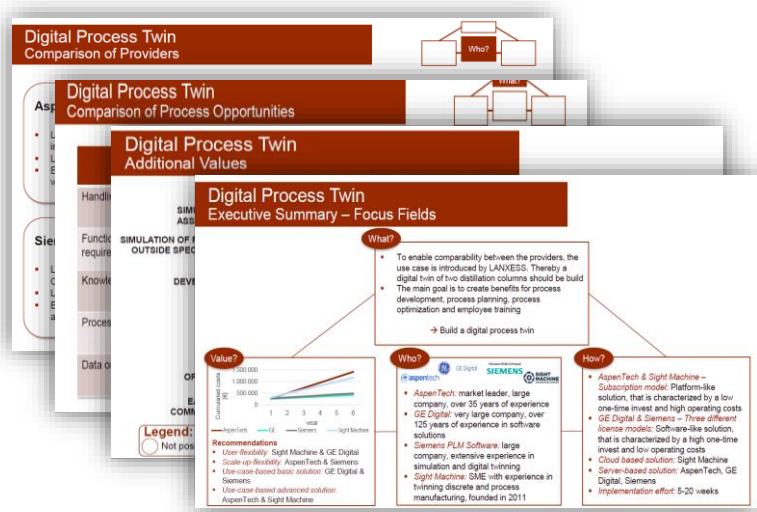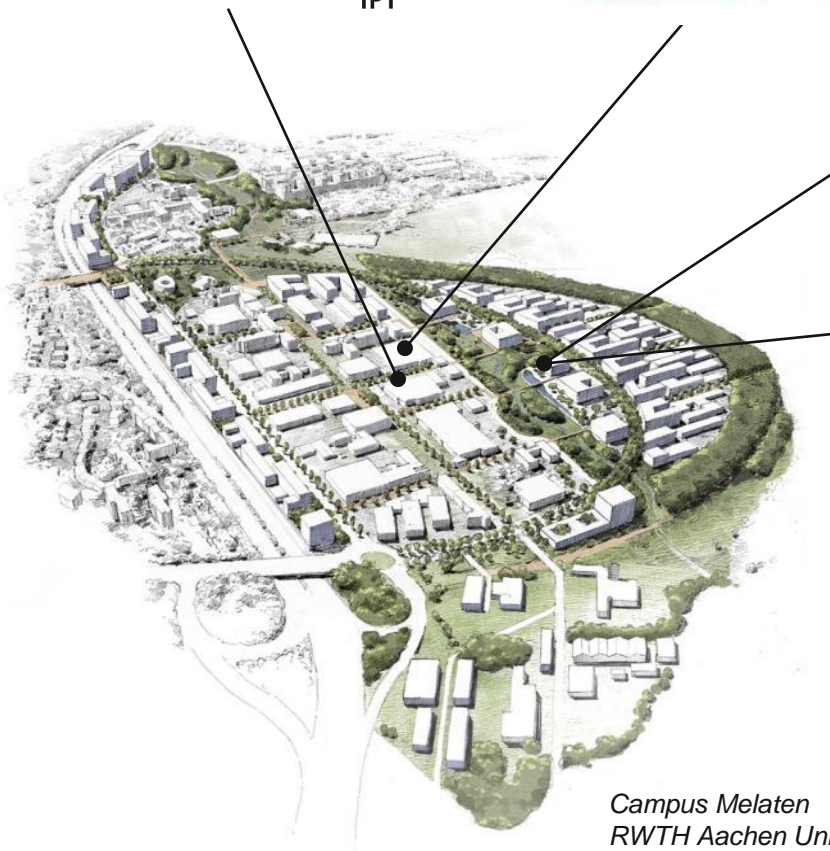
Business Case Evaluation

- **Detailed calculation of business cases** for the selected applications / solutions

- Assessment of potential **added value streams**

- Analysis of **added costs** for implementation

- Business model generation (where applicable)

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Involved Institutes and Companies
A powerful team in technology research

Campus Melaten
RWTH Aachen University

Your Expert Network:

Fraunhofer IPT
- Founding Year: 1980
- Knowledge and experience in all fields of production technology for developing and optimizing solutions for modern production facilities

WZL of Aachen University
- Founding Year: 1906
- Engineering and production management for developing and optimizing solutions for modern production facilities

FIR - Institute for Industrial Management at RWTH Aachen
- Founding Year: 1953
- Industry-oriented research in the areas service, information and production management

execon partners GmbH
- Founding Year: 2014
- Management Consultancy boutique focused on the Chemical & Life Science Industries

KEX Knowledge Exchange AG
- Founding Year: 2012
- Technology and market information provider

Your Contacts

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