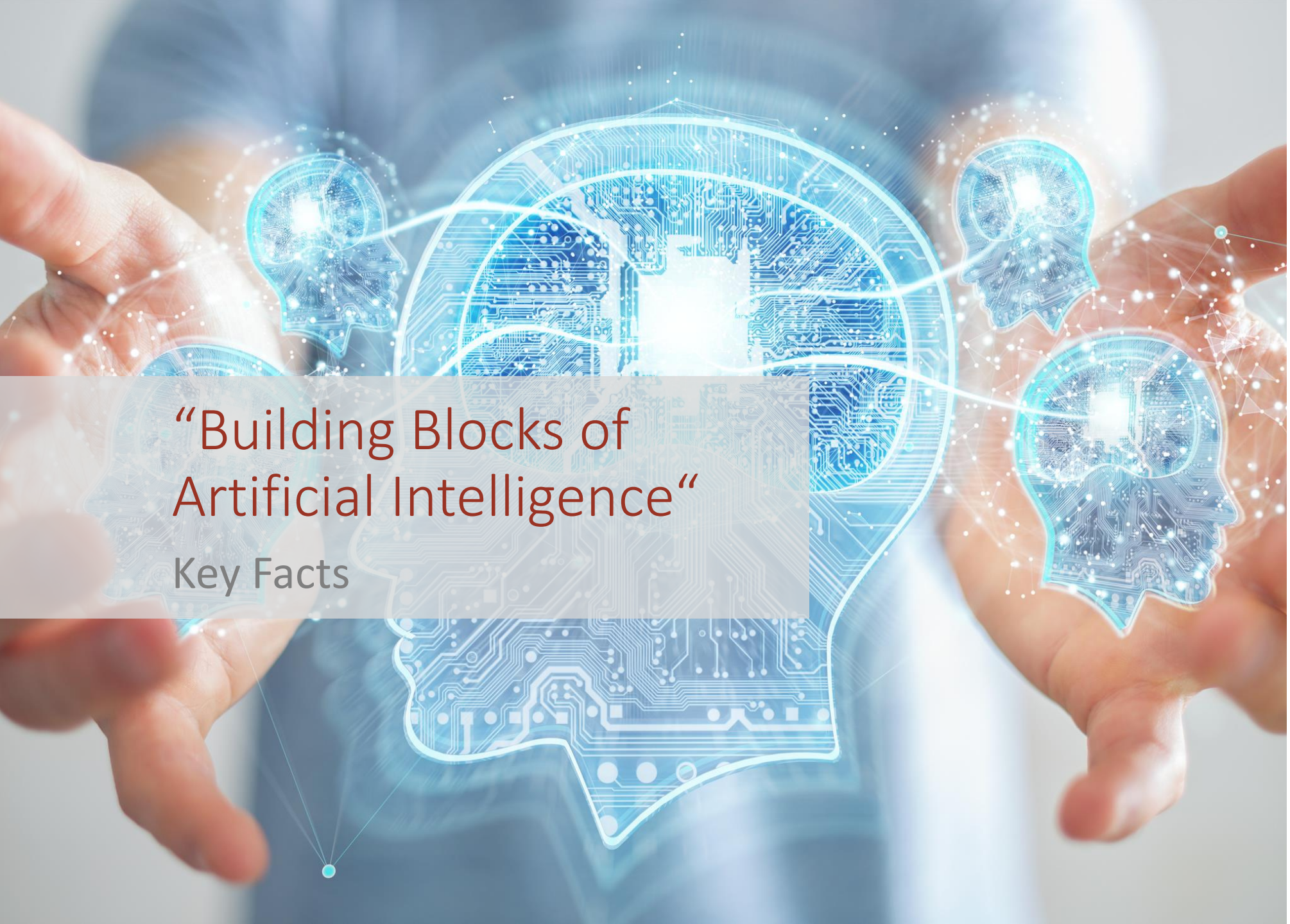


“Building Blocks of Artificial Intelligence“

Key Facts

KEX. Knowledge Exchange®

IfU | IMA | RWTH AACHEN UNIVERSITY

PADS Chair of Process and Data Science | RWTH AACHEN UNIVERSITY

TIME Research Area Technology, Innovation, Marketing, Entrepreneurship | RWTH AACHEN UNIVERSITY

Fraunhofer IPT

Fraunhofer SIT

JOIN THE CONSORTIUM

Major outcome of the project

KEX. Knowledge Exchange®

Learn how to utilize the groundbreaking potentials of artificial intelligence for industrial systems or in the context of commercial products and services:

- Global overview on market ready solutions and on the state of the art in research & development including use cases, pilots and concepts for AI applications
- Identification of key enabler technologies and deep dive on implementation challenges and solution approaches
- Business case and business model evaluation on selected applications
- Networking with a cross-industrial consortium and renowned research entities
- Data science certification course (RWTH certificate)

External Conditions
Start: June 12th 2019
End: Q2 2020
Approx. 20 consortium partners
€ 29,000

MOTIVATION

What is the job of Artificial Intelligence?

KEX. Knowledge Exchange®

Knowledge extraction from external information sources

Customer Relationships

Supplier Networks

World Wide Web
(social media, business networks, blogs, etc.)

Eliminate inefficiencies of internal processes and support business decisions

Supply Chain Management

Intralogistics

Production

R&D and Innovation

Marketing & Sales

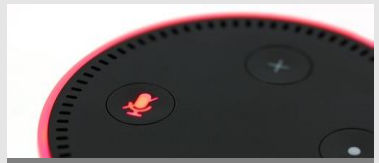
Human Resources

…etc.

Improve customer experience and product usability

Robotics

Industrial IoT



Smart Assistants

Chatbots

Autonomous Driving

Targeted Advertising

Improve communication and information gathering

Automate value creation (single tasks or whole processes)

Create additional customer value and competitive advantage

The project focus will be on the **in-depth evaluation of the relevant technical AI building blocks** while using selected methods and tools from the field of technology and innovation management to **identify future core competencies and to define individually promising use cases.**

PROJECT APPROACH

Structured technology intelligence process

Top-Down Analysis – Market Trends

- Health & Care
- Smart City Infrastructure
- Industry 4.0
- Internet of Things
- Smart Company

Future Product and Service Requirements

New Technological Possibilities

Applications & Technologies & Competencies

- Computer Vision
- Process Mining
- Cognitive Computing
- Natural Language Processing
- Knowledge Graphs
- IT-Security

Bottom-Up Analysis – Technology Trends

- Which low, medium and high skilled work will be replaced by AI?
- Who is developing the innovative applications that will change our everyday life?

- What is the state of the art in research and where are the AI community hot spots?
- When will technical solutions be market ready and how far is the industry in adopting AI?

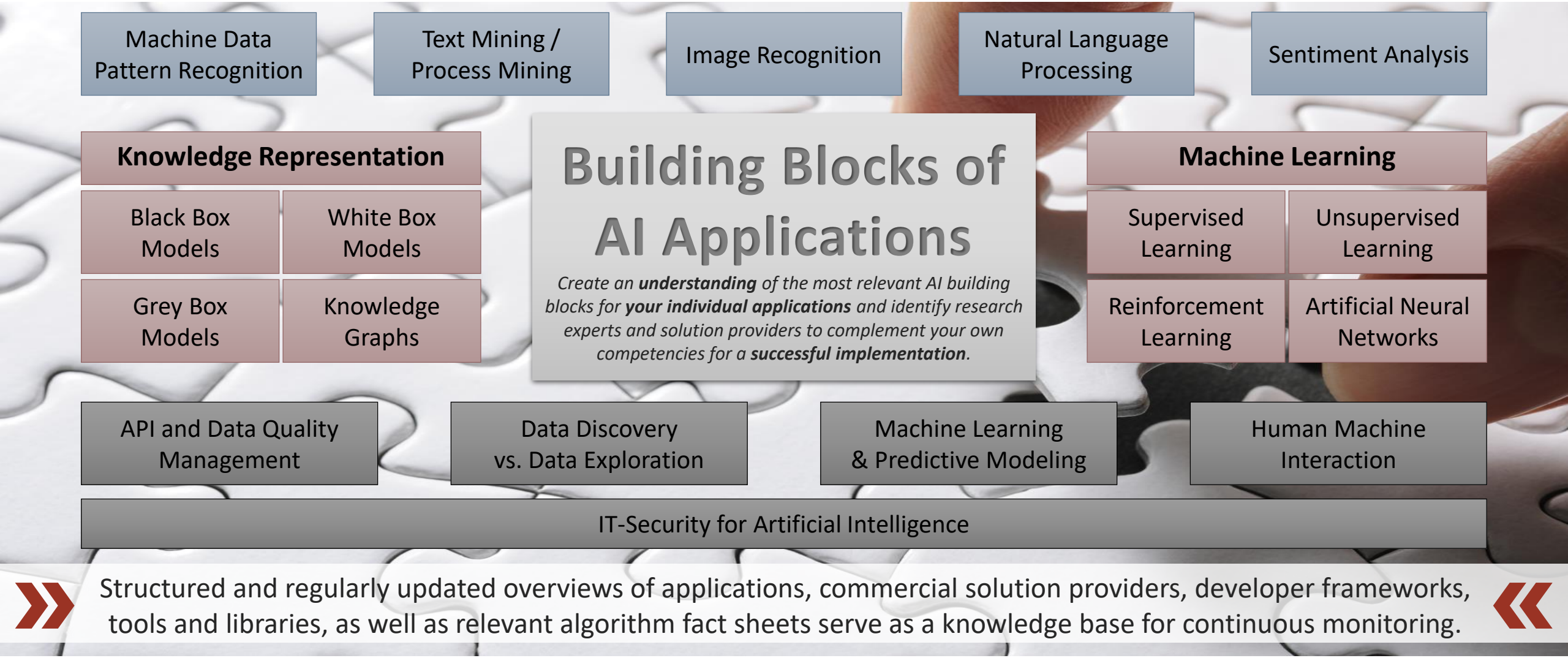
- What is the market potential and what are relevant business models?
- How to implement innovative solutions and who are valuable partners for me?

We will scan a broad solution space from different markets and show transferability potential. We will identify core technologies to watch and define common monitoring criteria. We will evaluate business models and scout for relevant solution providers.

PROJECT KNOWLEDGE BASE

Detailed technology and market overviews on AI building blocks

KEX. Knowledge Exchange®



Structured and regularly updated overviews of applications, commercial solution providers, developer frameworks, tools and libraries, as well as relevant algorithm fact sheets serve as a knowledge base for continuous monitoring.

TIMELINE & RESULTS

Consortium project Artificial Intelligence

KEX. Knowledge Exchange®

Project Kick-Off
Q2 2019

1st Report Meeting
Q3 2019

2nd Report Meeting
Q1 2020

Final Report Meeting
Q2 2020

STAGE 1

3 months
Knowledge base generation

- Questionnaire evaluation and **derivation of focus topics**
- **Segmentation** of application fields and target markets
- Internal and external **expert input** regarding the different **building blocks of artificial intelligence applications**

➢ **Common understanding of the project scope and knowledge base and selection of project focus in stage 2/3**

STAGE 2

3 months
Technology scanning & pre-evaluation

- Identification of up to 200 **use cases, best practices and research activities** within the derived segments
- Evaluation of the AI **research and solution provider landscape**
- Methods and tools for **long-term technology and solution provider monitoring**

➢ **Information basis for a long-term technology and solution provider monitoring and for the selection of focus applications for stage 3**

STAGE 3

4 months
Technology scouting on selected applications

- **In depth** technological or economic analysis of defined focus applications
  - Evaluation of the most relevant **technological challenges** (how to…?)
  - Evaluation of **economical potential** (cost drivers, business models, etc.)

➢ **Information basis for subsequent individual decisions regarding the initiation of specific implementation projects, training concepts and consortial collaboration activities**

Questionnaire | Consortium meeting | Certification course (for options see next slide) | Regular web-meetings with partners/experts | Selectable Workshops (for options see next slide)

SELECTABLE PROJECT CONTENT

Workshops, demonstrators and certification courses

KEX. Knowledge Exchange®

Panel Discussion - Ethics of AI
set for 1st report meeting

- Impulse lectures of renowned experts
- Moderated discussions and networking event

Business Model Innovation

- Customer centric business model design
- Job-to-be-done / design thinking method

Digital Transformation

- Methods & Tools of strategy and roadmap development
- Exchange of experience & best practices

Start-up Speed Dating

- Meet & greet with AI start-ups
- Moderated discussions and networking event

Application Demonstrators or Testbeds or Data Testing

Certification Course A
(Machine Learning & AI)

- Introduction to machine learning and AI
- Basics in Python
- Hands-on experience on behalf of a pre-defined use-case

Certification Course B
(Data Science for Engineers)

- Deep learning and artificial neuronal networks
- Case study: industrial applications and challenges in the area of production

Selectable Workshops:
The "Panel Discussion – Ethics of AI" will be fixed for the 1st report meeting. Two of the other three workshops can be selected by the consortium to be conducted in the interim and final meeting.

Demonstrators / Testbeds / Data Testing
The research partners will offer different proposals according to their field of expertise. The consortium partners might be able to provide own use cases or data. Proposals will be presented and discussed in the first web-meeting.

Certification Course:
Every consortium member will receive one voucher* for the certification course. The consortium will vote for one of the two courses. *enables one person to participate (additional participants for extra charge)

YOUR CONTRIBUTION

What do you have to bring in as a consortium partner?

	Your Input	Personnel Expenditure	Outcome
Questionnaire and optional interviews	• Reply to questionnaire • Tell us about your preferred topics and AI applications	approx. 1 PD (non presence)	➢ Possibility to place individual topics to steer the project content
Regular web-meetings with partners/experts	• Set impulses for project priorities and discussions • Propose specific collaboration formats	approx. 1 PD (virtual presence)	➢ Possibility to place individual topics ➢ Discuss project opportunities ➢ Form new business alliances
Consortium meetings	• Discussion with our research and consortium partners during the workshops and presentations • Optional: provision of specific use cases	4 PD* (Kick-off + Report Meetings) 3 PD (optional networking days)	➢ Knowledge exchange with peers and research experts ➢ Discuss project opportunities ➢ Form new business alliances
Certification course	• Organization and technical support before, during and after the course	3-5 PD (presence in Aachen)	➢ Personal RWTH Certificate

The personnel expenditure per partner to participate at the presentations of all project results together with the consortium is a minimum of 4 PD (Kick-Off + Report Meetings). Additional effort can be spent optionally at the networking days and regular web-meetings.

* PD = person days: To make sure that you´re able to listen to every presentation and workshop session, we recommend to send 2 persons per company to the presence meetings in Aachen.

PROCEEDING – STAGE 1

Kick-Off / Knowledge base generation / 1st report meeting

Project Kick-Off / 1st web-meeting

- All project partners will present themselves to each other and gain a common understanding of the project procedure, approach and scope
- Selection of workshops, demonstrators and certification course topics

Knowledge base generation

- Definition of application areas (e.g. Smart Health, Industrie 4.0, …) and sub segments that serve as the structure from a market perspective based on the consortium´s input from the questionnaires
- Scanning of the worldwide research landscape for current and future trends in the development of artificial intelligence leads to the technical focus fields – the AI building blocks

1st report meeting (Q3 2019)

- Impulse lectures by internal and external experts on relevant AI building blocks, exemplary use cases and fields of research
- Panel discussion on "Ethics of AI" with internal and external experts

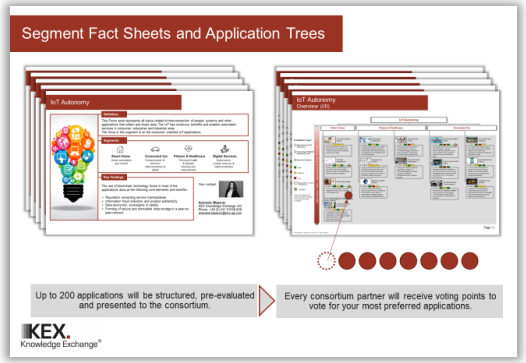
➢ **The consortium will have a common understanding of the project scope and will define the content focus of the next project stage**

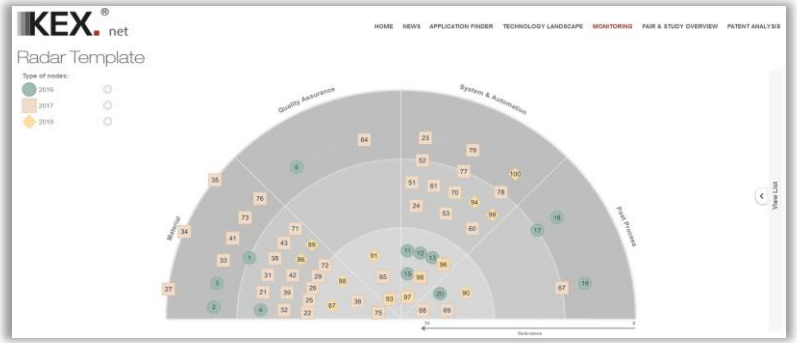
Stage 1

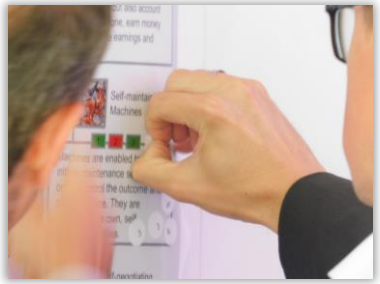
Networking and knowledge exchange are core elements of all project stages and meetings. We will make sure to provide you the required time and the space to make new business contacts, form new project alliances and to actively contribute your own experiences to the consortium project.

PROCEEDING – STAGE 2

Technology scanning & pre-evaluation / 2nd report meeting







Technology scanning & pre-evaluation

- Scanning and scouting for up to 200 relevant cross-industrial solutions and pre-evaluation of solution complexity, market readiness level and business impact
- Structured overview of solution providers, innovation hubs, research entities, and national or corporate roadmaps
- Creation of a long-term monitoring toolset

2nd report meeting (Q1 2020)

- Presentation of application overviews by our research experts
- Introduction to tools and methods for a long-term technology and solution provider monitoring (e.g. technology radar, provider landscape)
- Workshop on “Business Model Innovation” or “Digital Transformation” or “Start-up Speed Dating”
- The consortium will vote for focus applications to be evaluated in stage 3

➢ **The consortium received a broad overview of current and future AI solutions and will define focus applications for the next project stage**

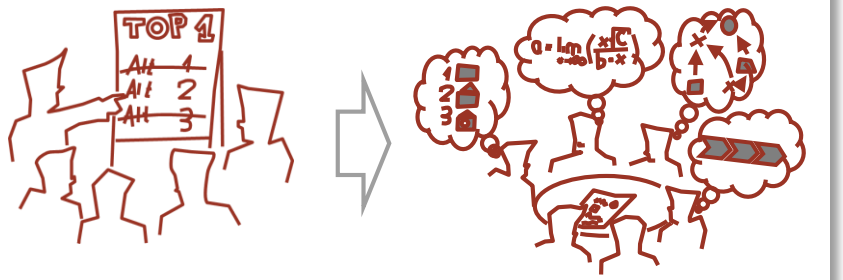
Stage 2

Networking and knowledge exchange are core elements of all project stages and meetings. We will make sure to provide you the required time and the space to make new business contacts, form new project alliances and to actively contribute your own experiences to the consortium project.

PROCEEDING – STAGE 3

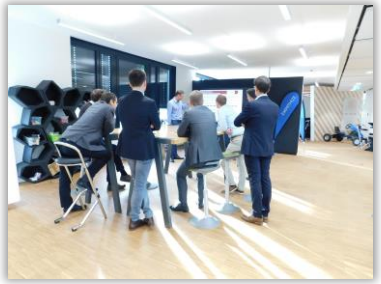
Technology scouting on selected applications / Final report meeting

KEX. Knowledge Exchange®



Definition of scope and focus agreement with consortium

Detailed focus case evaluation by our research experts



Technology scouting on selected applications

- In-depth evaluation of selected applications (consortium voting in stage 2) based on key questions that have been jointly defined by the consortium
- Application specific assessment of best practices and solution providers
- Elaboration of key challenges, required technology and competence fields as basis for future strategic decisions

Final report meeting (Q2 2020)

- Presentation of the selected technological or economical deep dives by our research experts
- Presentation of tools for a long-term technology and solution provider monitoring (e.g. technology radar, provider landscape)
- Workshop on “Business Model Innovation” or “Digital Transformation” or “Start-up Speed Dating”

➢ **The consortium partners will have a clear understanding of the core challenges and chances of AI in their individual business contexts and will have access to a broad cross-industrial expert and vendor network**

Stage 3

Networking and knowledge exchange are core elements of all project stages and meetings. We will make sure to provide you the required time and the space to make new business contacts, form new project alliances and to actively contribute your own experiences to the consortium project.

CONSORTIUM STRUCTURE

Knowledge generation in an interdisciplinary consortium

KEX. Knowledge Exchange®

Consortium Partners

Professionals in production, management, strategy, business development and marketing

Representatives of industries affected by advanced data analytics and artificial intelligence

Research Partners

KEX. Knowledge Exchange®

IfU | IMA | PADS Chair of Process and Data Science | TIME | RWTH AACHEN UNIVERSITY

Fraunhofer IPT | Fraunhofer SIT

Interdisciplinary Consortium

- Cross industrial consortium partners, research entities and solution providers
- Three major project meetings and regular web-meetings
- Networking and knowledge exchange at each meeting

Technology Providers

- Research entities
- Established solution providers
- Industry leaders
- Start-ups
- …

EXPERT NETWORK

RWTH Aachen Campus and beyond

KEX. Knowledge Exchange®

KEX. Knowledge Exchange®

Professional technology and market information provider founded 2012 as a spin-off of the Fraunhofer IPT
www.kex-ag.com

IfU IMA RWTH AACHEN UNIVERSITY

Research and teaching at the Cybernetics Lab represents consistent interdisciplinarity and cybernetic research methods since four decades
www. www.cybernetics-lab.de

PADS Chair of Process and Data Science | RWTH AACHEN UNIVERSITY

The scope of PADS includes all activities where discrete processes are analyzed, reengineered and/or supported in a data-driven manner
http://www.pads.rwth-aachen.de

TIME | RWTH AACHEN UNIVERSITY

Research and teaching with a strong focus on practical relevance in managing technology, innovation, marketing & entrepreneurship
www.time.rwth-aachen.de

Fraunhofer IPT

Knowledge and experience in all fields of production technology for optimizing solutions for modern production facilities
www.ipt.fraunhofer.de

Fraunhofer SIT

Research and development of applied cybersecurity, privacy and standardization solutions for general IT-security and in manufacturing
www.sit.fraunhofer.de

Campus Melaten

REFERENCE PARTNER

Former KEX consortium partners

KEX. Knowledge Exchange®

» More than 250 previous Consortium Partners*

* all mentioned companies are partners of a former consortium project hosted by KEX AG and it´s research partners

YOUR CONTACT

Marius Heidweiler

Project Manager

marius.heidweiler@kex-ag.com
+49 241 51038 631