

# WP T2 METHODOLOGY - DEVELOPMENT OF ECO4IN MODEL

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## WP 2 Methodology

This paper defines methodology for WP 2, Ecosystem development of ECO4IN project. Tasks for partners are summarized at the end of the document.

### 1. *What is an ecosystem*

The idea of a **knowledge ecosystem** is an approach to knowledge management which claims to foster the dynamic evolution of knowledge interactions between entities, to improve decision-making and innovation through improved evolutionary networks of collaboration.

Paul Shrivastava (1998) Knowledge Ecology: Knowledge Ecosystems for Business Education and Training

In contrast to purely directive management efforts that attempt either to manage or direct outcomes, knowledge ecosystems espouse that knowledge strategies should focus more on enabling self-organization in response to changing environments.

Jae-Suk Yang, Seungbyung Chae, Wooseop Kwak, Sun-Bin Kim, and In-mook Kim (2009). Agent-Based Approach for Revitalization Strategy of Knowledge Ecosystem J. Phys. Soc. Jpn. 78

1. **Core Technologies:** Knowledge ecosystems operate on two types of technological core - one dealing with the content or substantive knowledge of the industry, and the other involving computer hardware and software and telecommunications, that serve as the "procedural technology" of operations.
2. **Critical Interdependencies:** Organizational knowledge resides in a complex network of individuals, systems and procedures both inside and outside the organization. This network is established in the form of social and technological relationships. The relationships reflect vital interests and mutual histories. The elements of the network are dependent on each other for resources and mutual survival. Accessing and using this knowledge network involves understanding and maintaining the integrity of underlying relationships.
3. **Knowledge Engines and Agents:** This refers to the system of creating knowledge including the research and development processes, experts, operational managers/administrators, software systems, archival knowledge resources and databases.
4. **Performative Actions** Organizational knowledge is converted into economic value through processes that involve action. These could be cognitive actions such as learning or deciding, or physical actions such as preparing a meal or writing a check, and social actions such as organizing or entertaining. Organizational tasks most often require all these and other types of actions to occur in a linked way for value to be created. They occur in the physical spaces, electronic spaces, economic transactions, and communicative exchanges of knowledge tasks.

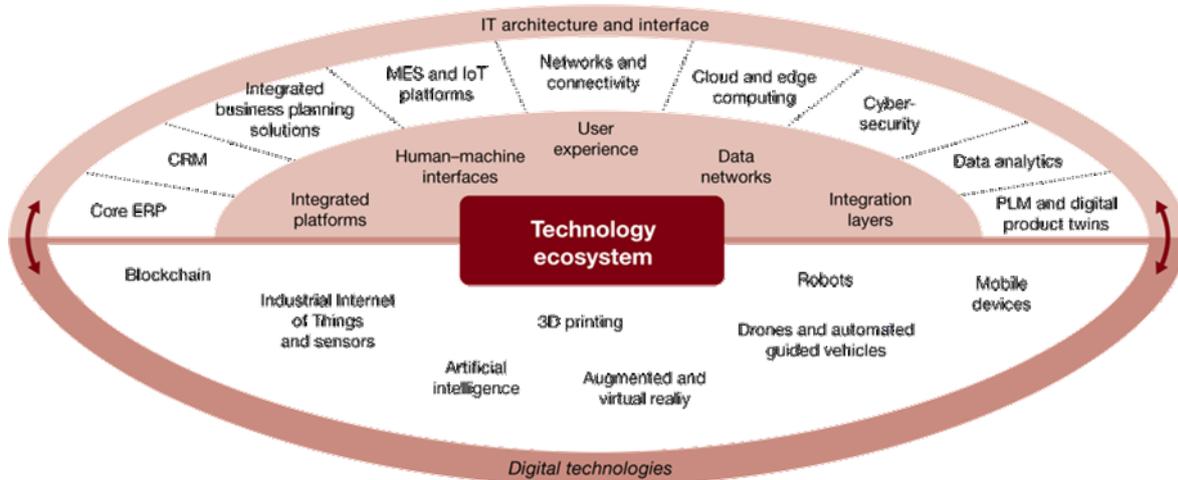
Bahrami, J. Stuart Evans (2005). The Research Laboratory: Silicon Valley's Knowledge Ecosystem, in Super-Flexibility for Knowledge Enterprises. Springer



## 2. Technological boundaries/definition of ecosystem

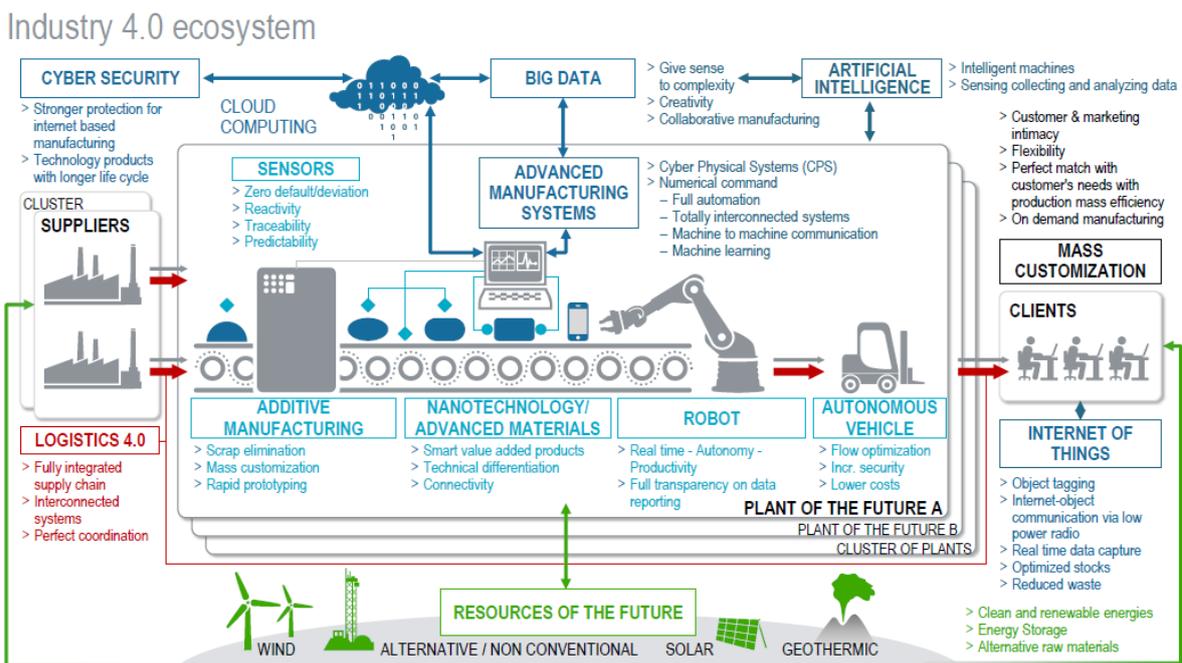
First step is to define technological borders of our Industry 4.0 ecosystem. So which technologies we recognized as an “Industry 4.0”. One of possible model is defined by company Price Waterhouse.

### Overview of the Technology ecosystem



Source: PwC's Strategy& Global Digital Operations Study 2018

Another model is defined here:





### 3. Impact to SME

#### 3.1. Prediction of main changes for SMES

- From rigid and manual work to agile and automated work.
- From product standardization to personalized and customized products.
- From large centralized companies to small factories and decentralized sites.
- From stock based planning to dynamic and predictive planning.
- From low cost and high efficiency to high return of capital employed (ROCE)
- From low and indirect customers (and end users) relationships to high and direct

Source: Roland Berger

#### 3.2. Main benefits for SME

- Cost optimization - reduce manpower cost, boost labour productivity
- New opportunities - adapt to changing demographic and customer demand, identify new value generating services
- Greater operational efficiency - improve process visibility and quality of products, reduce variability in operations, allow remote monitoring and maintenance
- External factors - develop competitive pressure on other companies, derive benefits from government incentives

Source: Roland Berger

### 4. Impacts on public administration

#### 4.1. Prediction of main changes for public admin.

- VET training system, regional, national, multinational level.
- Negative image of VET training among people,
- Lifelong training
- Connectivity, 5G networks development, covering remote areas.
- Industrial space - industrial zones, special industrial zones.

#### 4.2. Best practice for skills development.

- Up to date curricula in line with industry requirement.
- Practical training - learn and practice, dual training model.
- Infrastructure - holistic learning environment, access to state of art industrial machines, equipment and tools.
- Standards and Qualifications which allows students to change education tracks.
- Quality of trainers -SWO trainers with industry experience and knowledge.
- Increasing positive image of VET

Source : Roland Berger

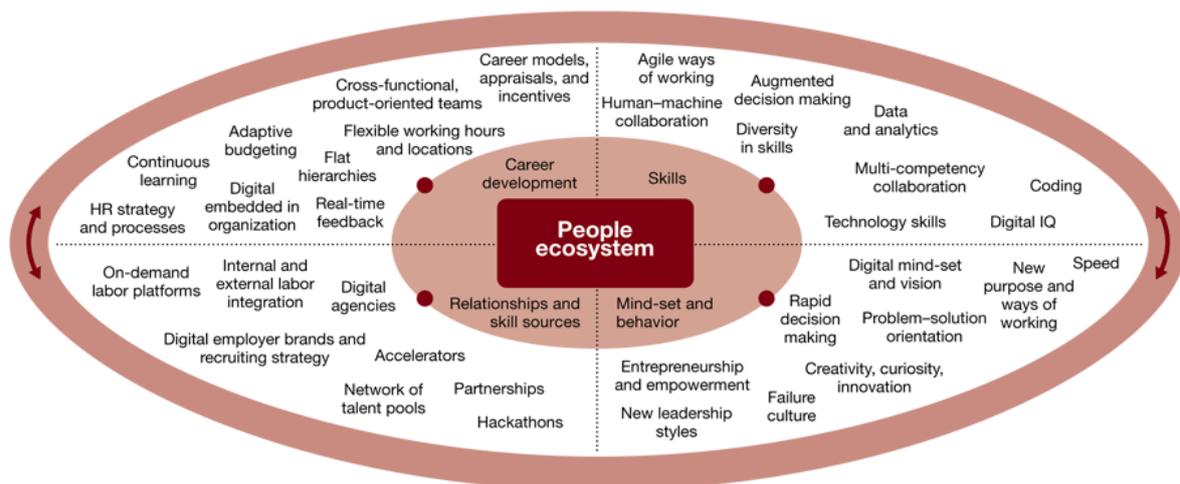


## 5. Impacts on workforce

- 90 % of employees need digital skills - basic IT knowledge, machine to machine communication, ability to process and analyse data, understanding visual data presentation, basic statistical knowledge.
- Long life training is essential
- Abilities -cognitive analytics, physical abilities
- Basic skills - content and process skills
- Cross functional skills - social, technical, resource management, complex problem solving, system skills

Source : Roland Berger

### Overview of the People ecosystem



Source: PwC's Strategy& Global Digital Operations Study 2018

## 6. Knowledge Ecosystem Building

Steps for ecosystem building in ECOS4IN work packages.

1. Analysis of ecosystem borders, tools, infrastructures (WP1)
2. Ecosystem vision (WP2)
3. Concept - public services business model, reaction on above mentioned challenges (WP2)
4. Set up ecosystem governance, stakeholders' roles, agreement, progress monitoring (WP3)
5. Building ecosystem capabilities (WP3 based on best cases of WP1 and additional research)



## 7. Deliverable list and schedule.

Deliverables T.2.1, Transnational meeting (TEG) in Poland (completed).

Deliverables T.2.1.2, Development of ECOS4IN model, partners will work out the responses on questions in chapter 7 of this document and send them to the Lead partner. Lead partner will summarise the data into the draft of the model (business model canvas, mind map) till the end of February. Partners will provide comments within March 2020.

Deliverable T.2.2.1, SWOT analysis of corresponding regions. Methodology (template) of SWOT analysis will be completed till the middle of January 2020, partners will provide this document to the LP till the end of March 2020.

Deliverable T.2.2.2, Description of study visits, each partner will prepare one-page proposal for two days study visit. The possibility to participate in regional conference, event, workshops focused on Industry 4.0 topic in partner regions can be included.

Deliverable T.2.2.3, Regional stakeholders meetings in all partner regions.

Deliverable T.2.2.4, GAP analysis - template will be send together with draft of Ecosystem model till the end of February. Partners will prepare GAP analysis during March for “peer review” which will be organized during TEG meeting in Austria.

Deliverable T.2.2.5, Peer review

Deliverable T.2.2.6, TEG meeting in Upper Austria,

## 8. Tasks for partners in WP2.

- 1) Do you have any ideas concerning points 2,3,4.
  - Eliminated something?
  - Add something?
- 2) Please describe shortly “what is the smart specialization in your region, expected impacts from Industry 4.0” (one-page summary).
- 3) Please prepare ideas about study tour (see instructions above).
- 4) Continue in deeper analysis in by discussions during Krakow TEG meeting.
- 5) Please identify articles, literature concerning Industry 4.0 ecosystems (on regional level)

Annex: Knowledge base - literature.