BACK TO THE FUTURE: SCOPING DYNAMICS IN INDUSTRIAL INNOVATION

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OBJECTIVES
SCOPING DYNAMICS: EX POST – EX ANTE

- What were the signposts of industrial innovation in the last century?
- How will industrial innovation look like in 2030?

→ Literature analysis: history of industrial innovation
→ Foresight study: innovation 2030
HISTORY OF INDUSTRIAL INNOVATION
STRUCTURE OF INDUSTRIAL INNOVATION
FIVE ACTION FIELDS

strategy
people
industrial
innovation
processes
methods
& tools
organisation

Source: Gelec et al. 2015, 70f
HISTORY OF INDUSTRIAL INNOVATION
ACTION FIELD: PEOPLE

academic staff

integration of functional areas

expert career

lead engineers and product champions

increasing mobility and diversity

1875 1900 1925 1950 1975 2000 2020
HISTORY OF INDUSTRIAL INNOVATION
ACTION FIELD: STRATEGY

black hole demand, scientific insights und breakthroughs

technology push and market pull

product-service combination

portfolio-planning

1875  1900  1925  1950  1975  2000  2020

reduction of the share of basic research
HISTORY OF INDUSTRIAL INNOVATION

ACTION FIELD: ORGANISATION

assembly-line-structures

central research laboratories

assignment to business units

project-structures

agile, flexible structures

open innovation, start-ups

separation of innovation phases and disciplines, bureaucratisation

Opening and resolution of isolated structures

1875 1900 1925 1950 1975 2000 2020
HISTORY OF INDUSTRIAL INNOVATION
ACTION FIELD: PROCESS

assembly line processes
waterfall model
Integration of service development
agile and flexible processes
opening and globalisation
increasing application of process metrics

1875 1900 1925 1950 1975 2000 2020
HISTORY OF INDUSTRIAL INNOVATION
ACTION FIELD: METHODEN & TOOLS

- Project and risk management
- Creativity methods, balanced scorecard, scenario technique
- QFD, QM, Agile, Lean
- PDM, PLM, simulation
- CAD, CAM
- Increasing digital support and use of databases

- 1875
- 1900
- 1925
- 1950
- 1975
- 2000
- 2020
INNOVATION 2030
INDUSTRIAL INNOVATION 2030
SCOPING FUTURE DYNAMICS
INDUSTRIAL INNOVATION 2030

DESCRIPTORS FOR INDUSTRIAL INNOVATION SYSTEMS

- artificial intelligence
- availability of knowledge
- convergence of technologies
- digital support of innovation processes
- European culture
- European values
- exploitation of data
- fairness of standards
- form of data
- form of publication
- form of software
- imagination
- innovation culture
- level of digitization
- level of interdisciplinarity
- manageability of complexity
- number of stakeholders involved
- openness of innovation processes
- openness of innovation systems
- results of innovation processes
- role of R&D departments
- share of radical innovations
- sharing of resources
- speed of innovation processes

theses for innovation in 2030

- thesis 1: openness, ability to learn and cooperation
- thesis 2: integrated solutions
- thesis 3: fully digitised innovation processes
- thesis 4: open science
- thesis 5: data security and sovereignty
INDUSTRIAL INNOVATION 2030

Thesis 1
"In 2030, openness, the ability to learn and cooperation will be the guiding principles of innovation."

Thesis 2
“In 2030, integrated solutions will be the focus of innovation activities.”

Thesis 3
“In 2030, innovation processes will be fully digitised.”

Thesis 4
"In 2030, knowledge will be open to all – the challenge will be to apply it profitability.“

Thesis 5
"In 2030, Europe will enjoy unique global competitive advantages in terms of data security and autonomy."
CONCLUSION
SCOPING DYNAMICS IN INDUSTRIAL INNOVATION

Repeating:
- Open organisational structures (open innovation)
- Breakthrough innovation

Continuous:
- Increasing complexity

(relatively) new:
- Digitisation
DISCUSSION

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http://www.innovation.fraunhofer.de
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