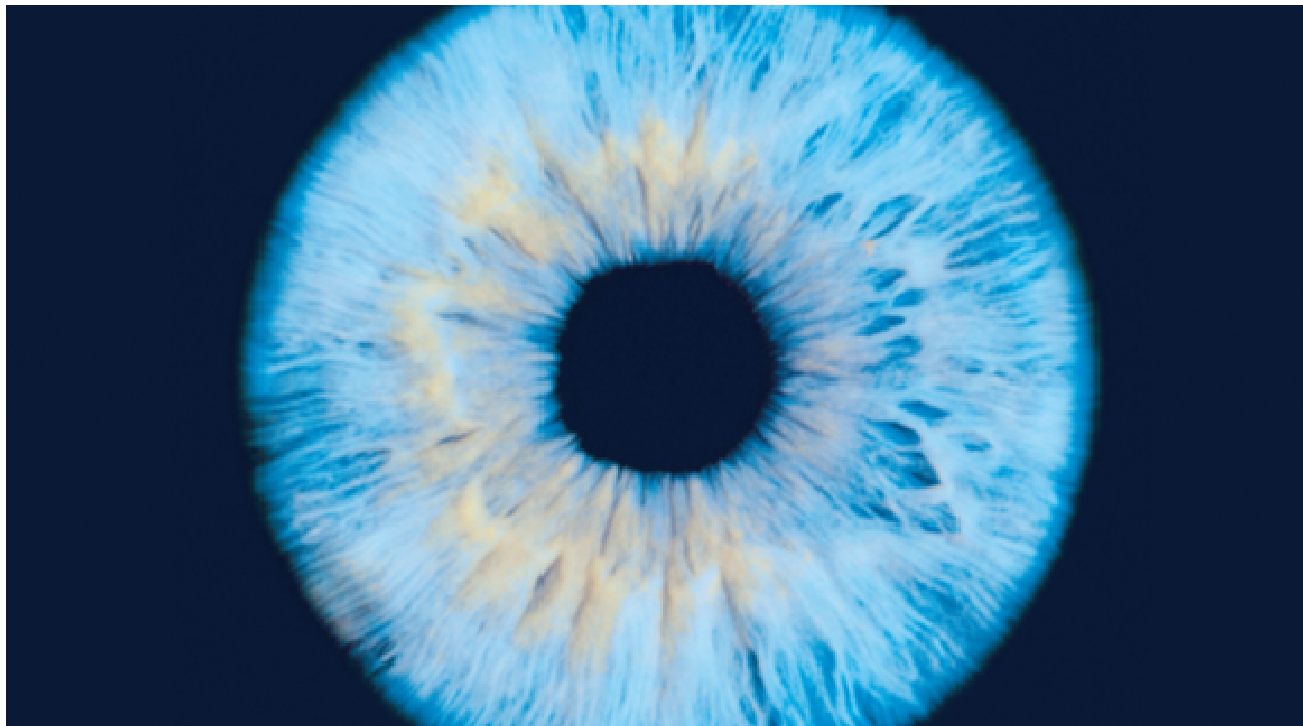

INTRODUCTION TO METHODOLOGIES IN FORESIGHT

Dr. Kerstin Cuhls

EMO FORUM Workshop, Madrid, January 2011



Agenda

- **Foresight**
- **Methods**
- **Examples Fraunhofer ISI**
- **Examples ESF**
- **Some Benefits**

What is Foresight?

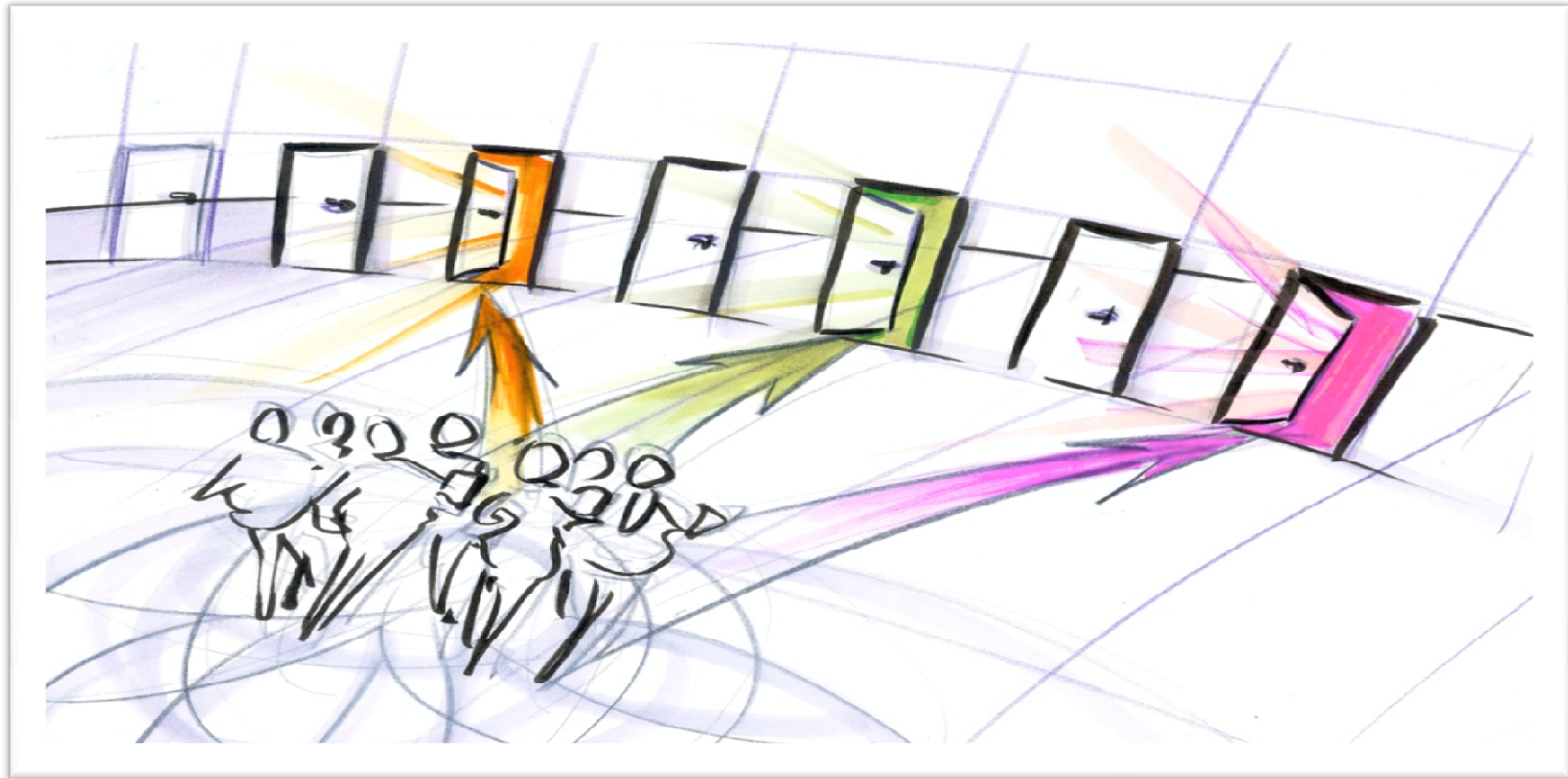
**Foresight is the
structured debate
about complex futures**

FORESIGHT

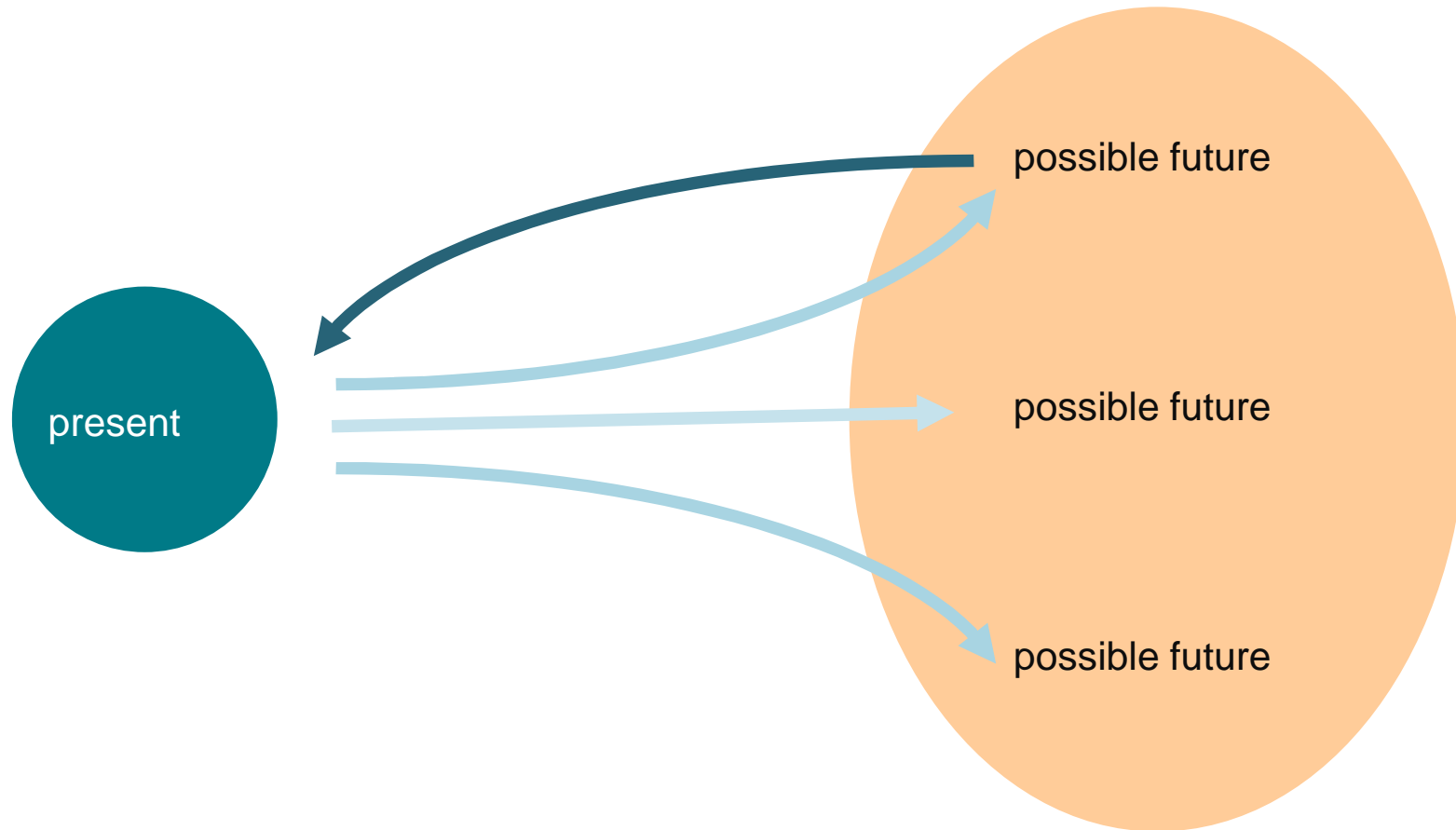
Foresight is the structured debate about complex futures

- **structured:** systematic approach by applying methods of futures research, science-based, based on new theories of futures research
 - **debate:** interaction of relevant actors, active preparation for the future or different futures, orientation towards shaping the future
 - **complex:** consideration of systemic interdependencies, holistic view
 - **futures:** open view on different paths into the future, thinking in alternatives
-
- **long- and medium-term view**
 - **no planning**, but a step on the way to planning (strategic foresight)
 - **no prediction**

FORESIGHT



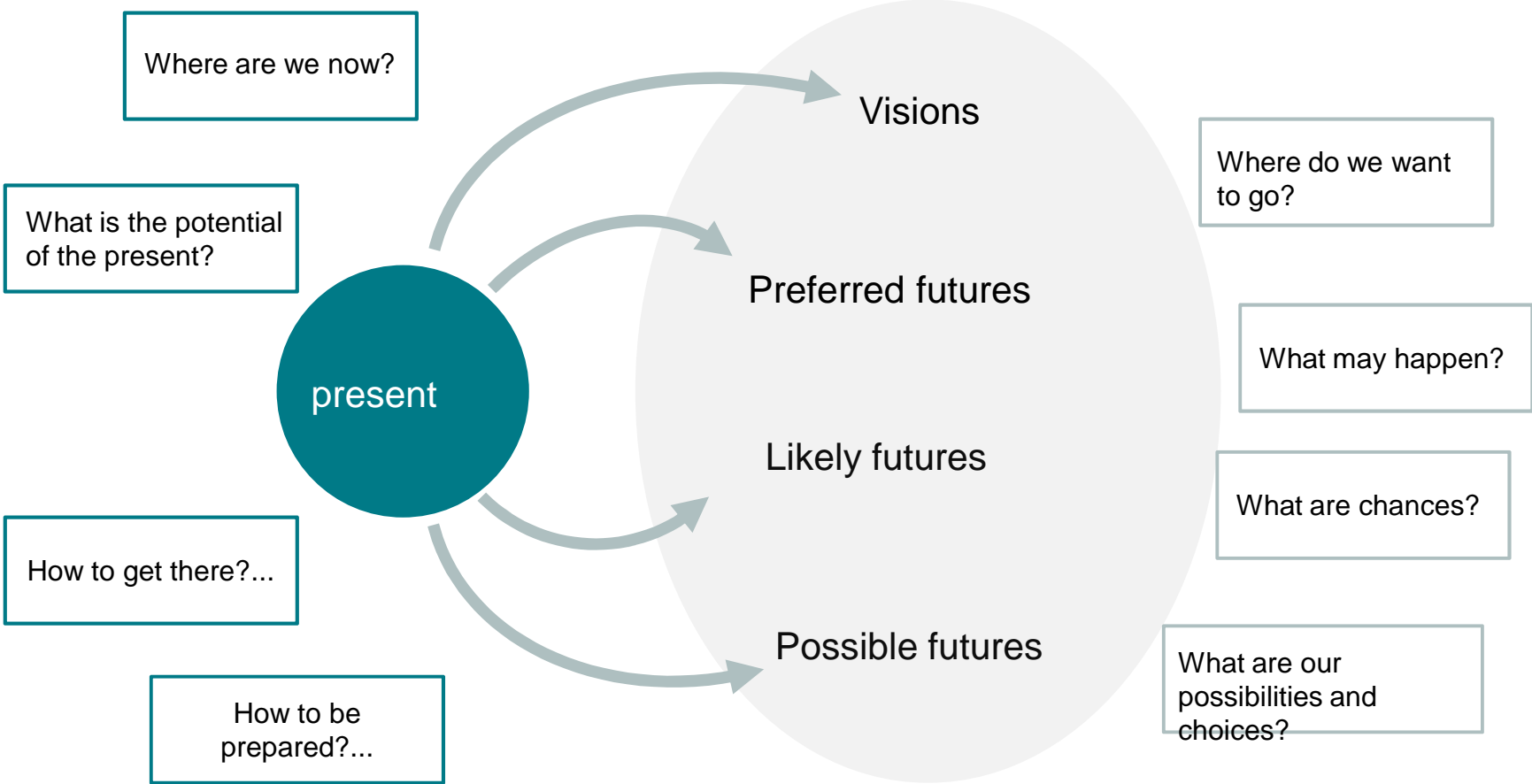
Systematic Exploration of Different Futures



Time Horizon

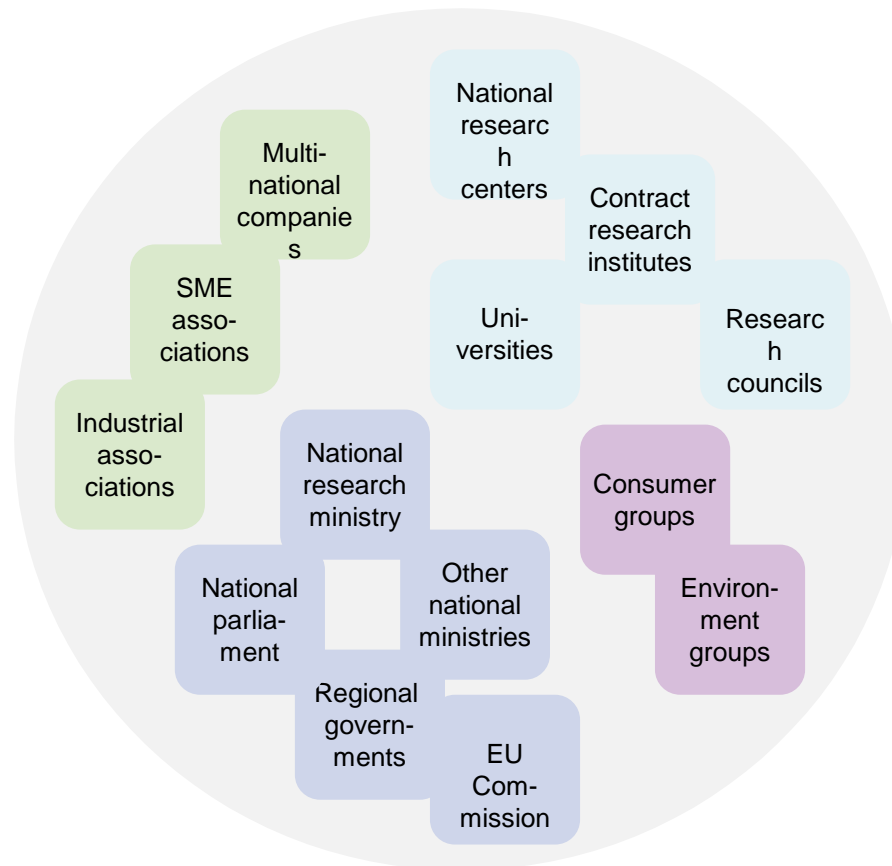


Different methods address different questions

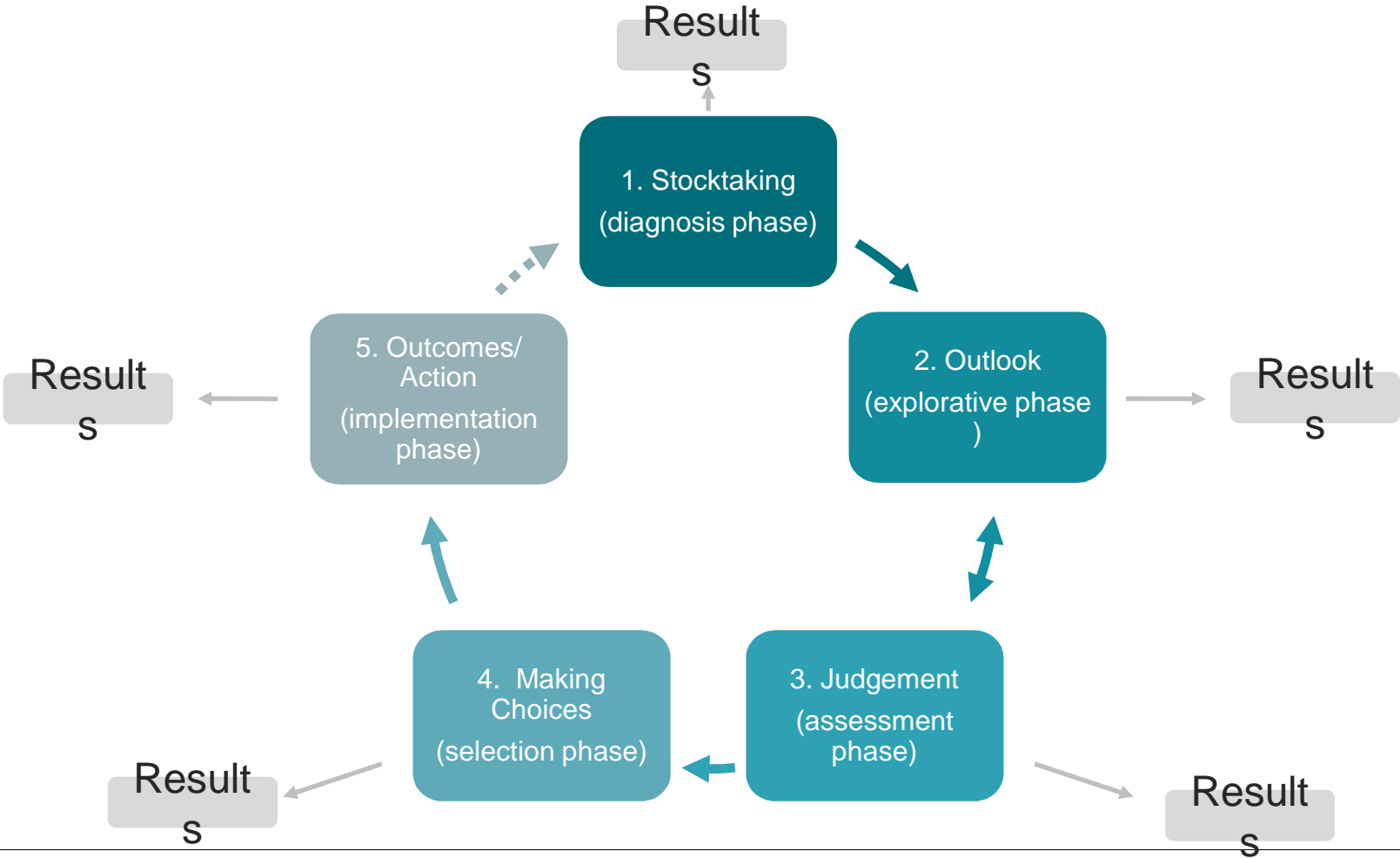


Making Use of Distributed Intelligence

Strategic intelligence
of the different actors
in the innovation system



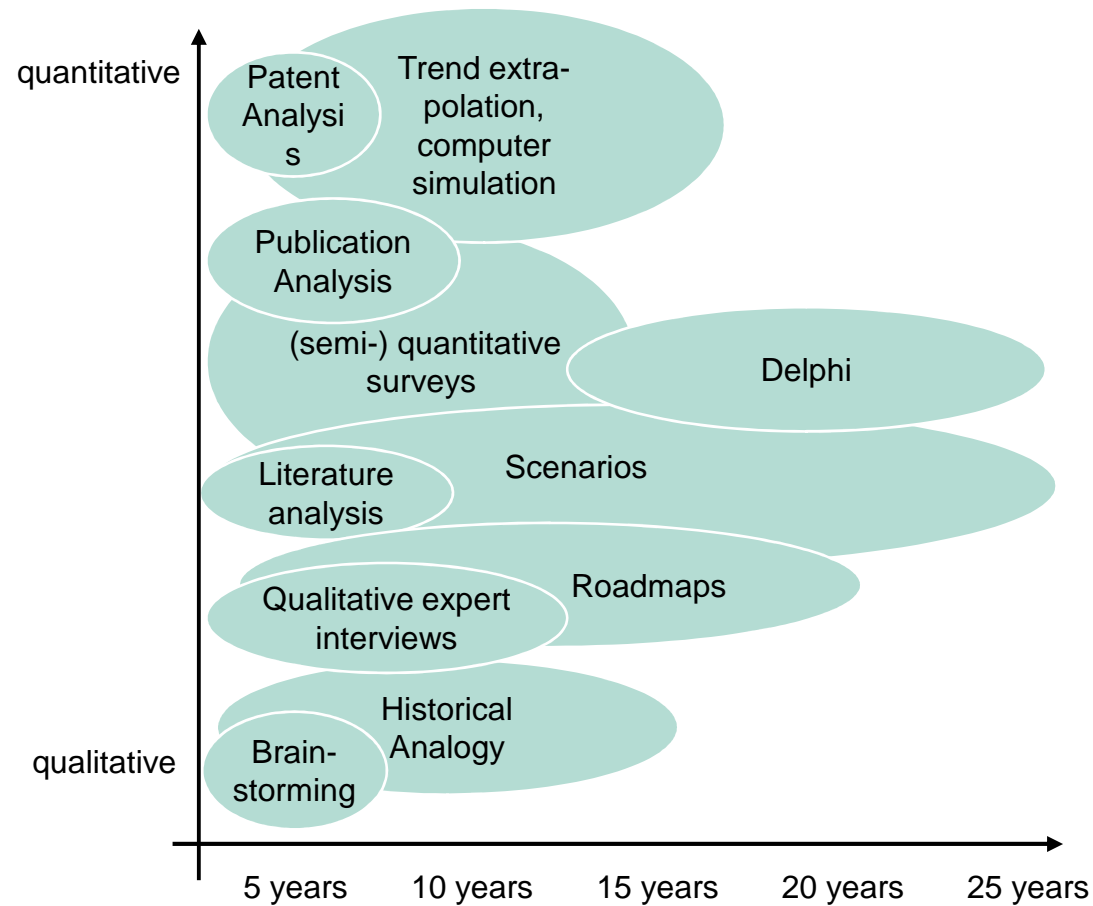
Phases of Foresight



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Application of methods



- raw classification of the different methods/ concepts
- depending on the implementation of the methods/ concepts into the project context shifts can result
- often a combination of the methods/ concepts is used

Methods within FOR-LEARN Online Guide

Methods & Tools	Diagnosis	Prognosis	Prescription	Quantitative	Qualitative	Normative	Exploratory	Predictive	Open
Environmental Scanning & Watching	XX			X	X				
System Dynamics	XX			X	X		X	X	
Structural Analysis (e.g. MICMAC)	XX			X	X		X	X	
Agent Modelling (e.g. MACTOR)	XX				X		X	X	
SWOT Analysis	XX	X			X		X	X	
Trend Intra & Extrapolation	X	XX		X	X		X	X	
Modelling & Simulation	X	XX		X			X	X	
Gaming	X	XX			X		X		X
Creativity Methods (Brainstorming, Mindmapping...)	X	XX	X		X	X	X		X
Expert Panels		XX	X		X	X	X		X
Delphi survey	X	X	X	X	X	X	XX	X	
Backcasting		X	XX	X	X	X		X	
S&T Roadmapping		X	X		X	XX	X	X	
Critical & Key Technology Study	X	X	XX	X	X	X		X	
Scenario Building		XX			X	X	X		X
Morphological Analysis & Relevance Trees		XX	X		X	X			X
Cross-Impact Analysis (e.g. SMIC)		XX		X	X		X		X
Multi-Criteria Analysis (e.g. MULTIPOL)			XX	X	X	X		X	

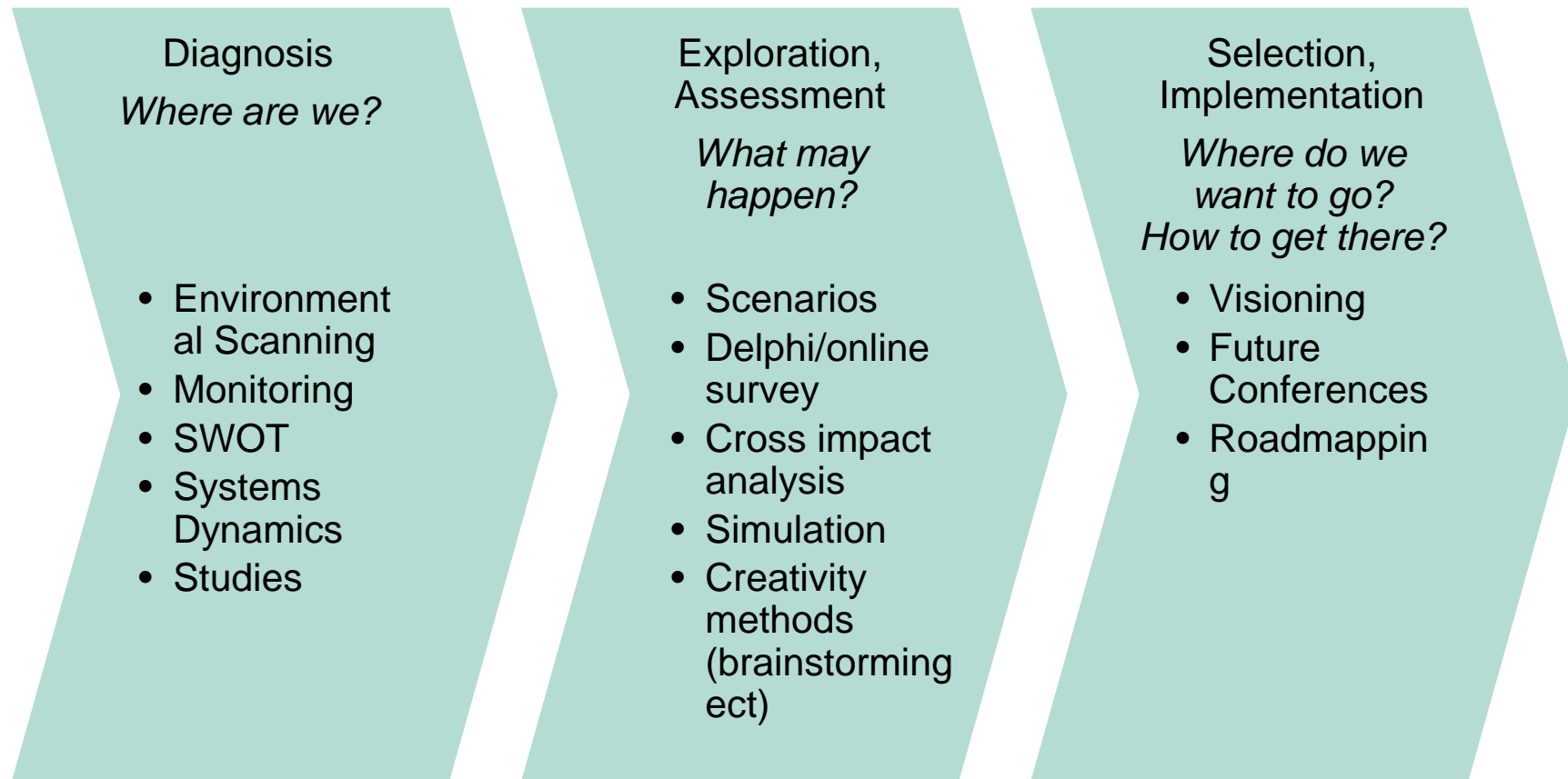
http://forlearn.jrc.ec.europa.eu/guide/0_home/index.htm

Methodology...



Georghiou, Luke et. al: The Handbook of Technology Foresight, Concepts and Practice, PRIME Series on Research and Innovation Policy, 2008

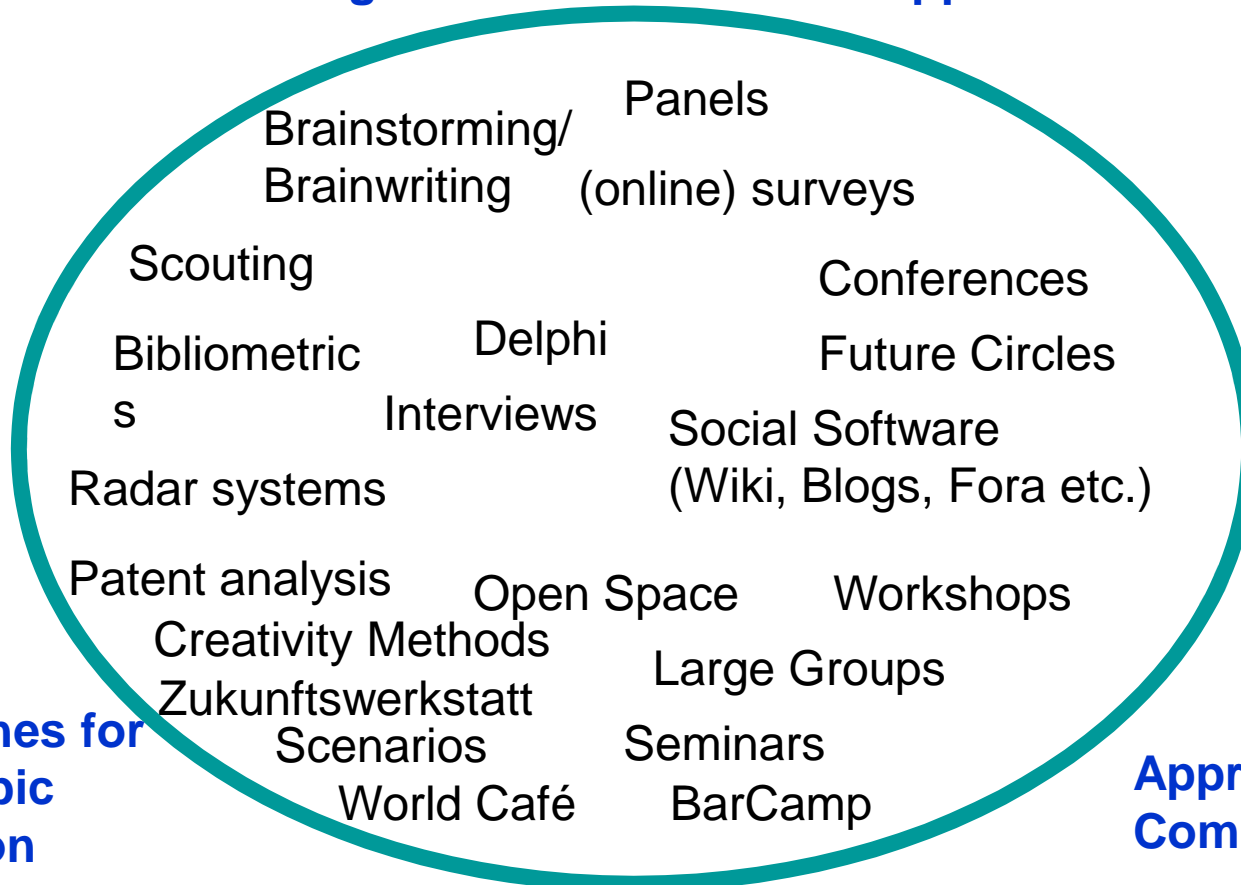
Tailoring methods to phases



APPROACHES

Approaches for searching

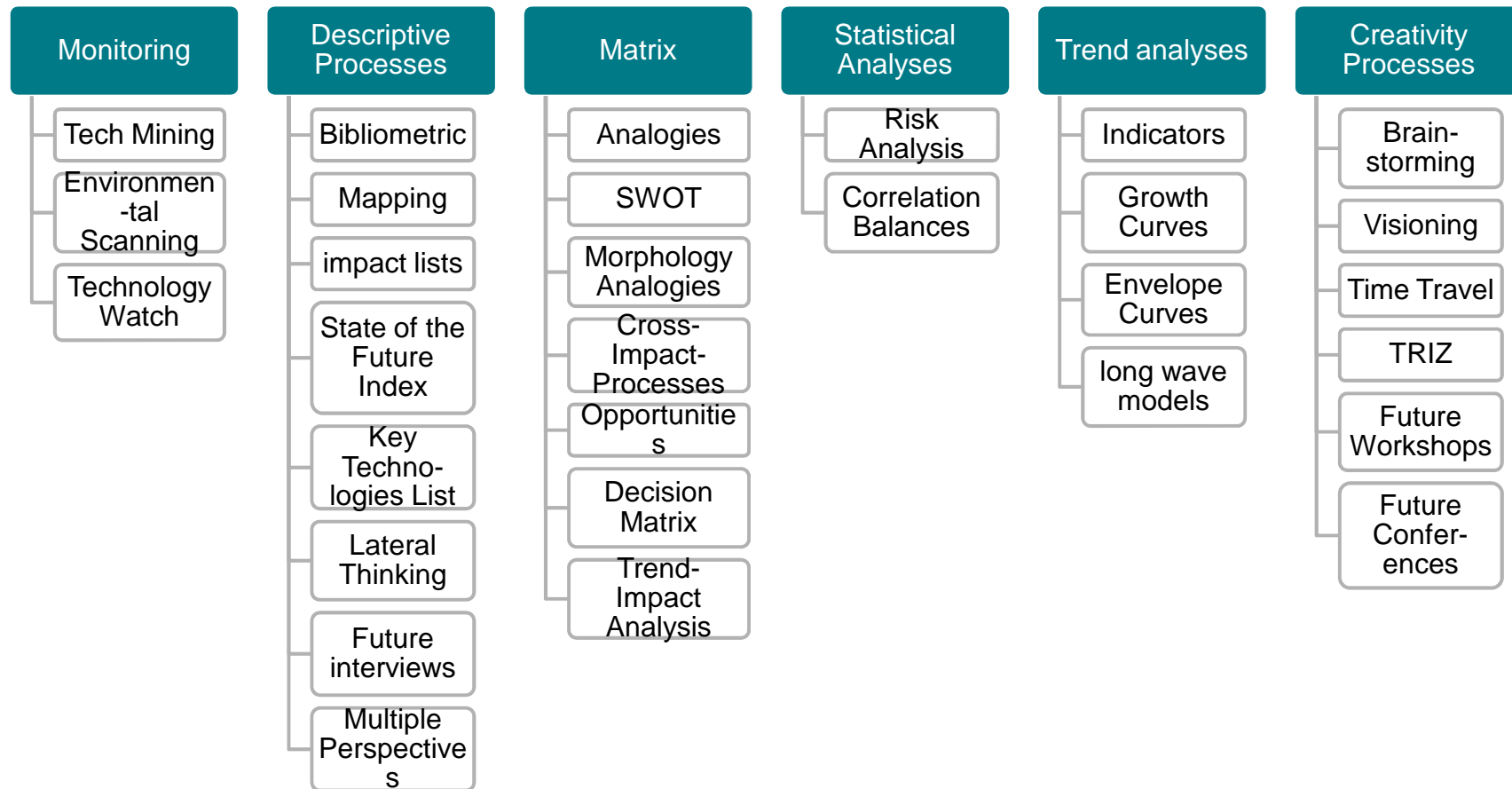
Approaches for assessment



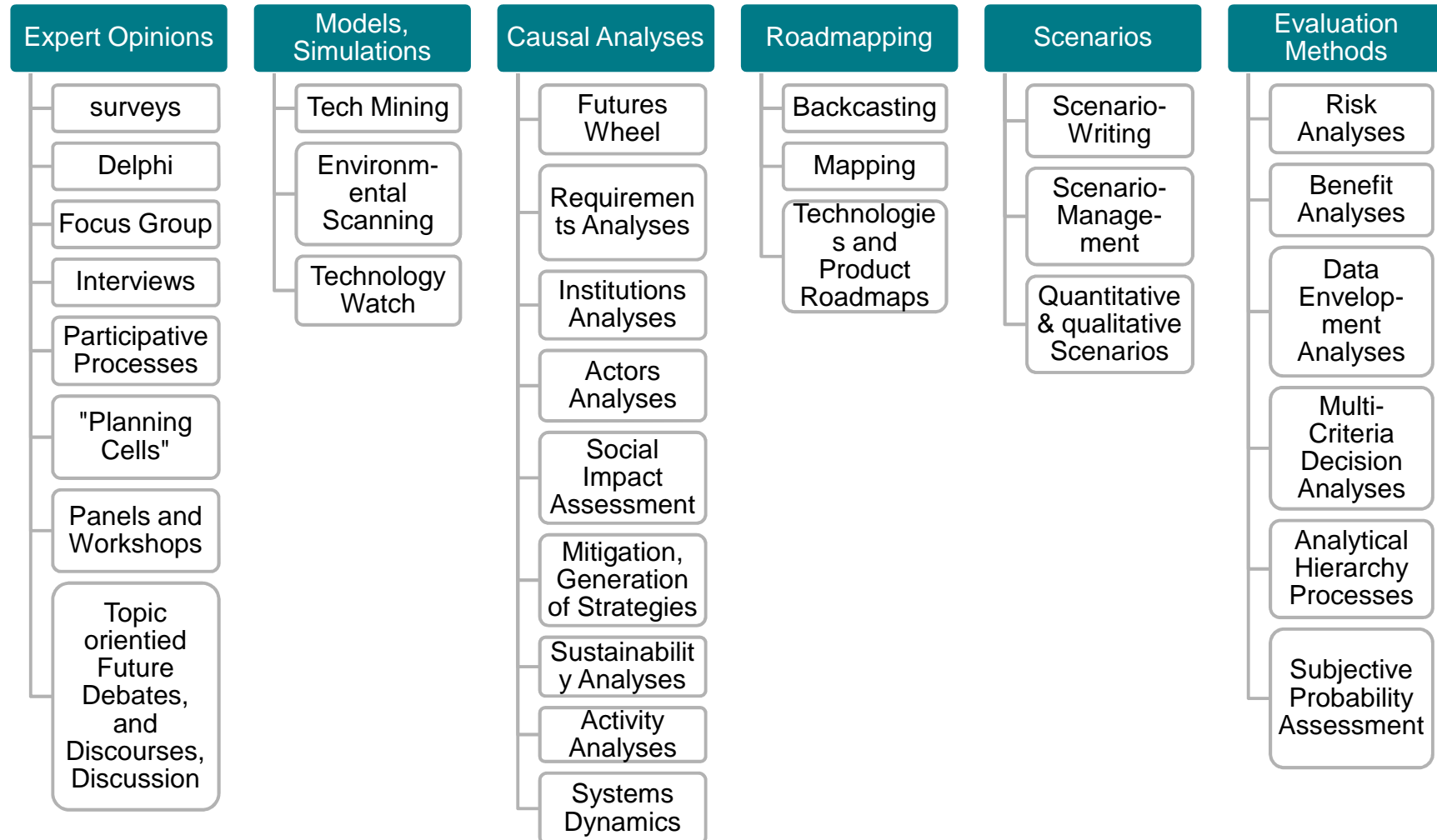
**Approaches for
ideas/ topic
generation**

**Approaches for
Communication**

Diversity of Methods



Diversity of Methods



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First Example: BMBF Foresight Process Objectives

1. Identification of new focuses in research and technology
2. Designation of areas for cross-cutting activities
3. Exploration of fields for strategic partnerships
4. Derivation of priority activity lines for R&D policy

www.bmbf-foresight.de

Some Methodological Elements BMBF-Foresight-Process

1. Identification of topics in research and development; characterization of knowledge dynamics with a tailor-made set of methods

- searches performed by 22 topic coordinators (literatur, expert dialogues)
- statistical analysis of scientific publications (bibliometrics)
- broad online survey (2659)
- international Monitoring Panel (70 interviews world-wide)
- intensive documentation of the results

2. Clustering and working out long-term relevant cross-cutting perspectives

- with a view on the „Knowledge Dynamics“ of the research landscape (institutional setting) and the demand side

Topic searches

November 2007

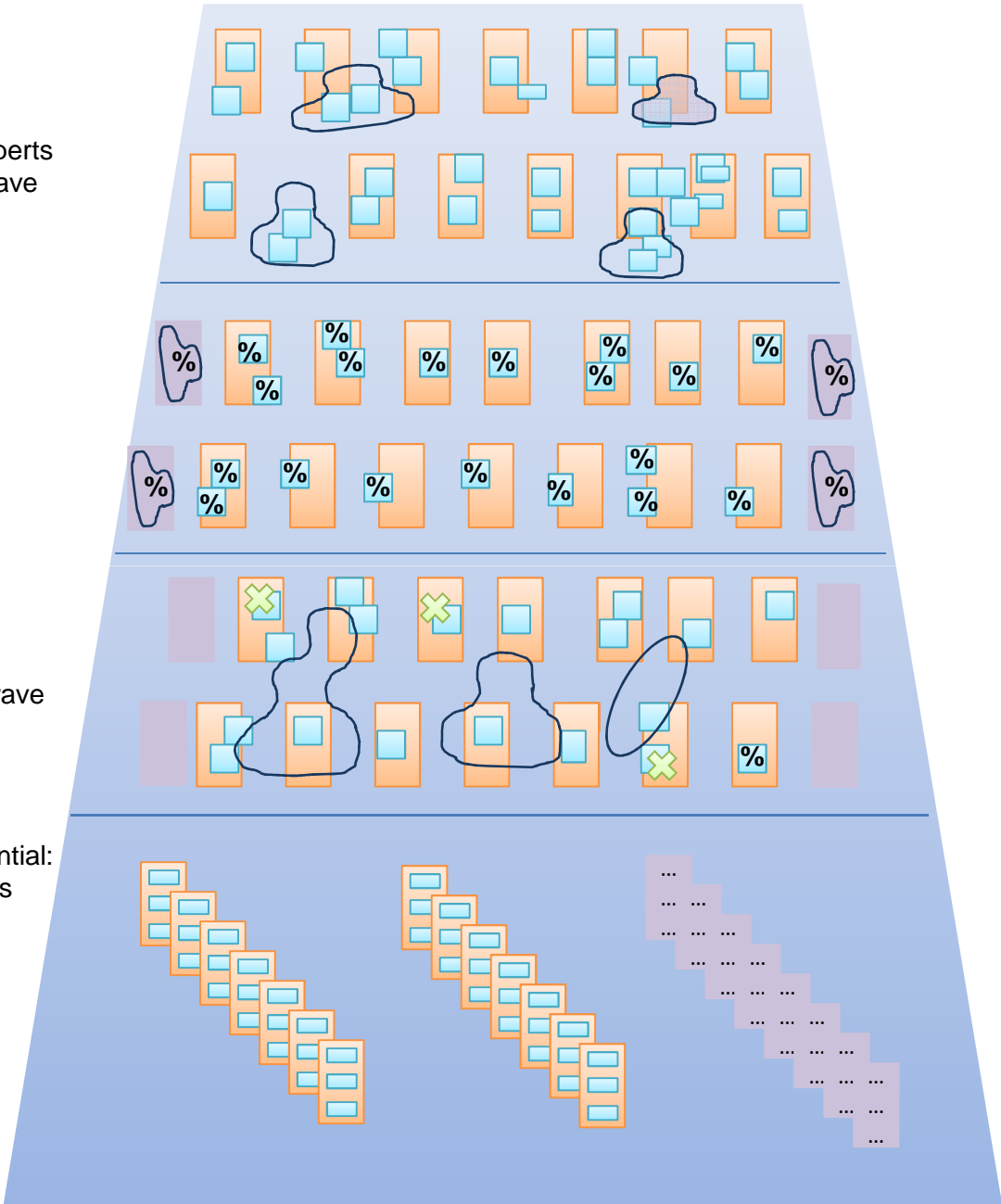
Research
Workshop of experts
Monitoring 1st wave

Online survey

Synopsis of researches
Monitoring 2nd wave

Analysis of potential:
Actors and topics

June 2009





Mapping of future topics 

in 14 start fields 

First re-clustering 

1st report

Differentiated evaluation 

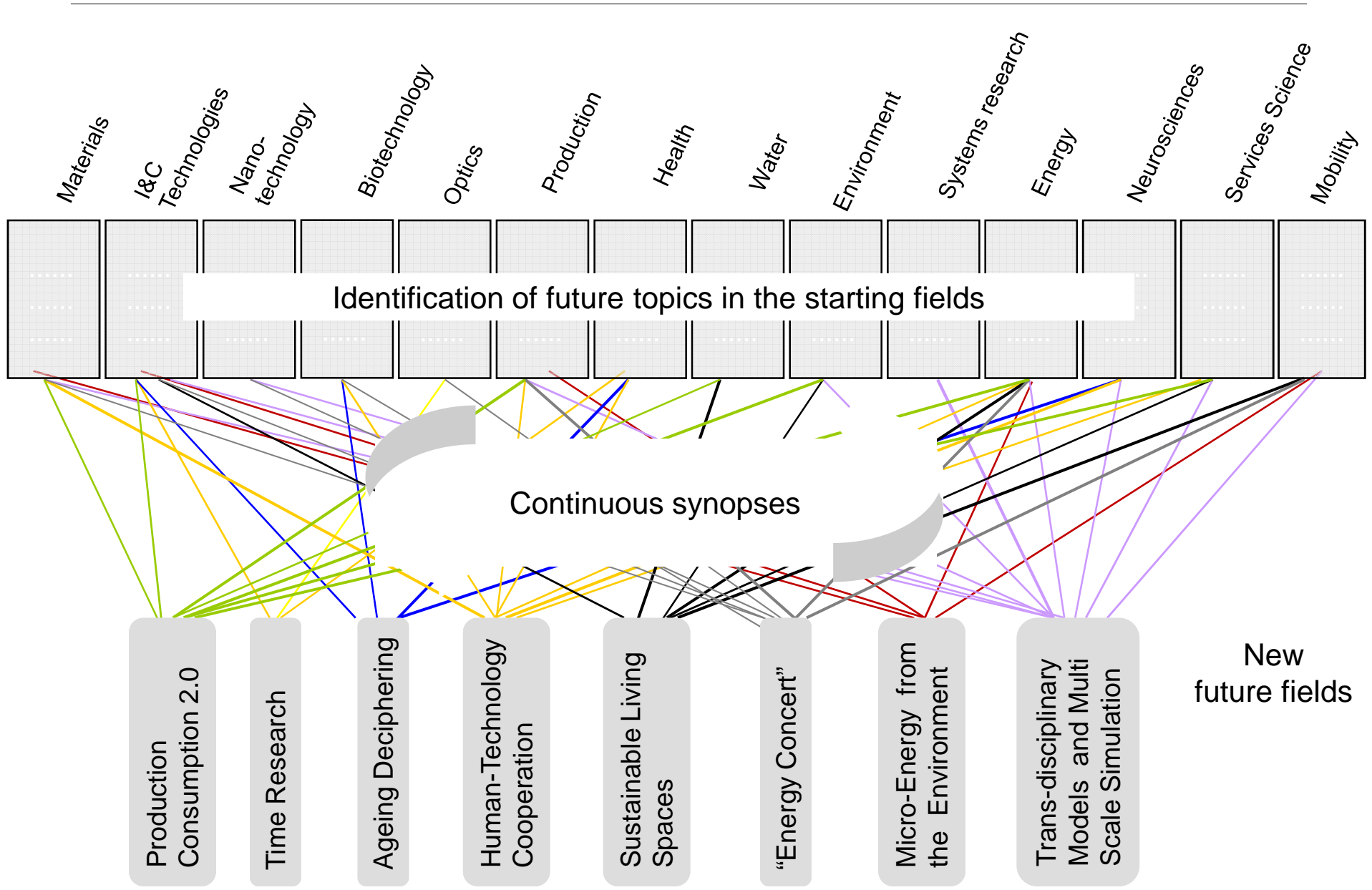
Selection according to criteria, re-clustering 


2nd report

Future topics evaluated for 14 start fields

Topics, actors, recommended action in 7 new forms of future fields

3rd report



Second Example: FAZIT

- Forschungsprojekt für aktuelle und zukunftsorientierte Informations- und Medientechnologie und deren Nutzung in Baden-Württemberg

- Combination of
- **3 Delphi surveys:**
 - 1. How do we make use of information and communication technologies in 2020?
 - 2. Future IT for Health
 - 3. Future information and communication technologies

- **Scenarios**
- **Roadmap Process**

www.fazit-forschung.de

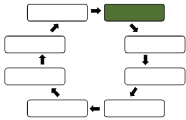
Third Example

Envisioning future research horizons

Scenarios for the European research landscape 2025

Envisioning future research horizons

Scenarios for the European research landscape 2025



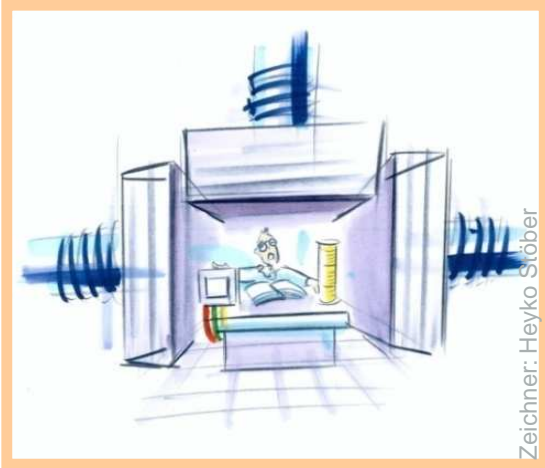
European Research Area:
mission accomplished



Restricted Innovation in a
Europe of Regions



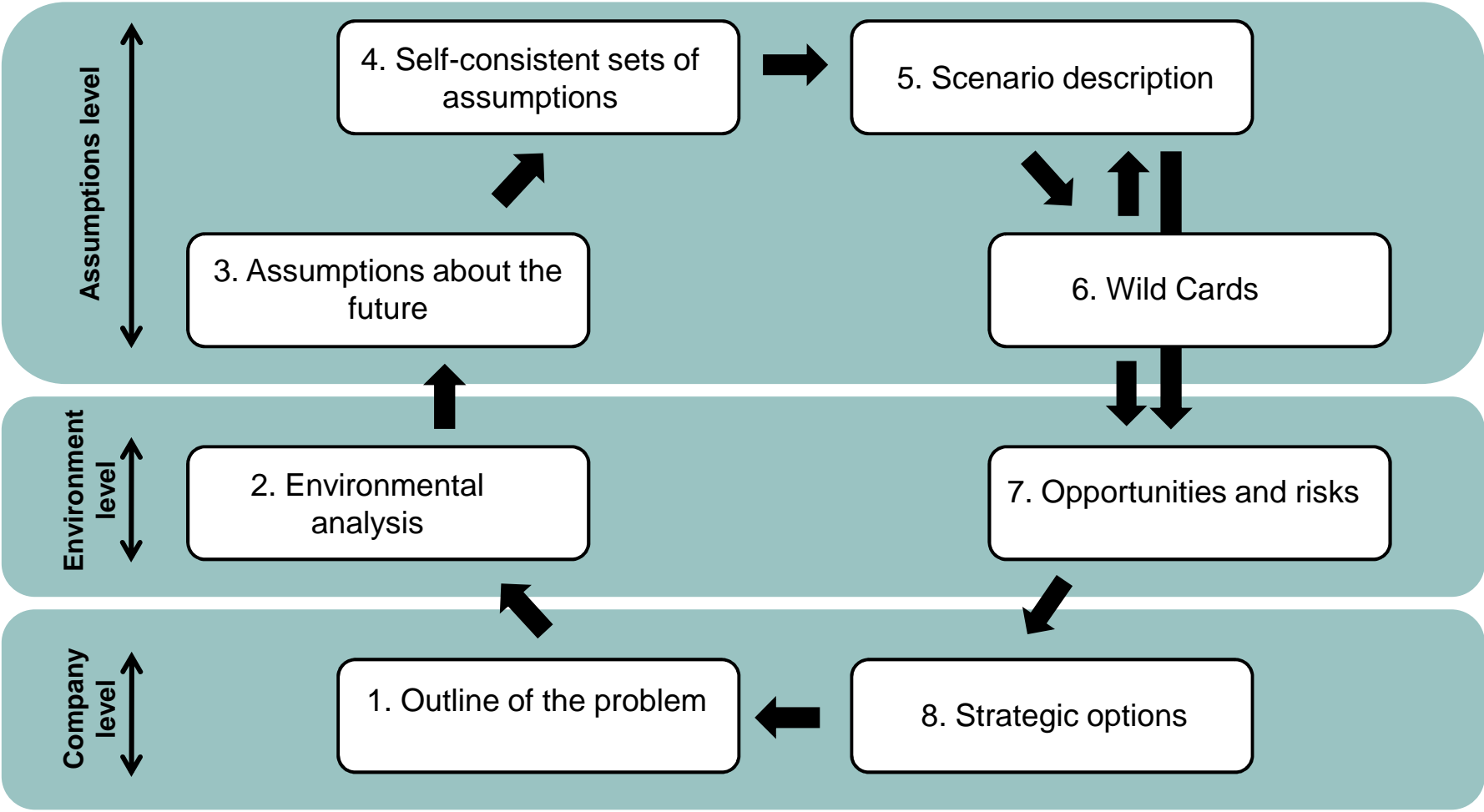
Muddling Through



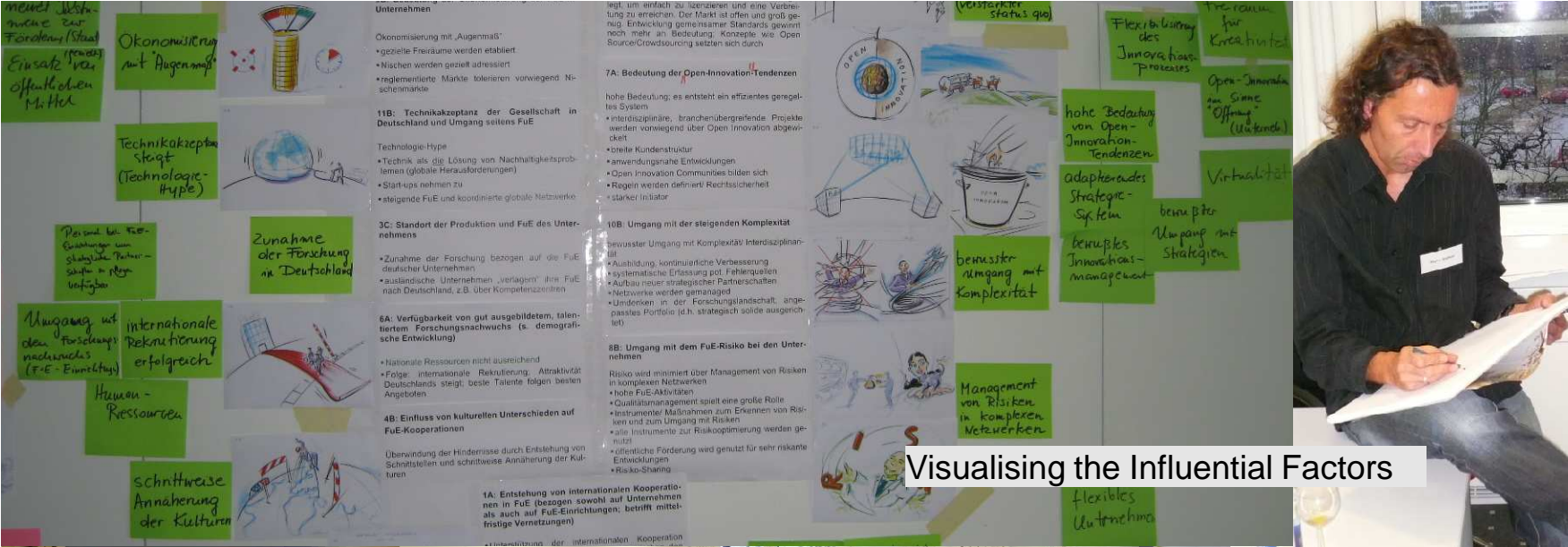
Research and Industry under
Pressure

Zeichner: Heyko Stöber

Scenario Methodology as a Strategic Planning Tool



Collecting, Discussing, Visualising and Selecting the Influential Factors



Visualising the Influential Factors



Collecting Influential Factors

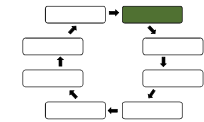


Discussing Influential Factors



Selecting the most important ones

Scenario Description



BEGRENZTE INNOVATIONEN IM EUROPA DER REGIONEN



Zeichner: Heyko Stöber

Die europäische Forschung geht strukturell erneuert aus der Krise hervor. Es können sich diejenigen Forschungseinrichtungen behaupten, welche sich gezielt auf ihre Stärken konzentriert haben. Neue Forschungsstrukturen zeichnen sich durch ein hohes Vernetzungspotenzial aus, sowohl mit der Wirtschaft als auch mit der Gesellschaft. Die steuernde und gestaltende Rolle der Nationen und der supranationalen Organisationen wie der EU nimmt dagegen ab, u. a. wegen der hohen Verschuldung der Mitgliedsländer. Während daher der große »Tanker Europa« nur langsam wieder Fahrt aufnimmt, entwickeln sich kleinere Regionen innerhalb Europas durchaus erfolgreich und prosperieren. Es entstehen sogenannte Hotspots, d. h. Technologieregionen, die zu einer verstärkten Anlagerung von Unternehmen und exzellenter Forschung führen. Im harten internationalen Wettbewerb gelingt es daher zumindest in einzelnen europäischen Regionen, derartige Hotspots zu schaffen und damit Anziehungspunkte für wichtige Akteure in der Forschungslandschaft zu bieten. Aufgrund der Ökonomisierung der Forschung orientieren sich Unternehmen konsequent an Standorten mit exzellenten Bedingungen, u. a. einer FuE-Exzellenz.

Agenda

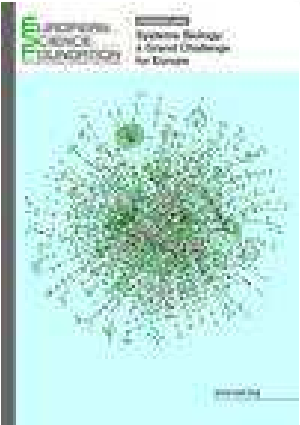
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Forward Looks

Looking Beyond the Endless Frontier



Systems Biology:
A Grand
Challenge for
Europe



Nanoscience and
the Long-Term
Future of
Information
Technology (NSIT)



Forward Looks

- Others are in preparation
- Fraunhofer ISI involved in
 - TECHBREAK: Technological Breakthroughs for Scientific Progress (Space Sciences)
 - GENESIS: Gene Environment Interaction in Chronic Disease

➤ **Chance: use different/ broader methodology**

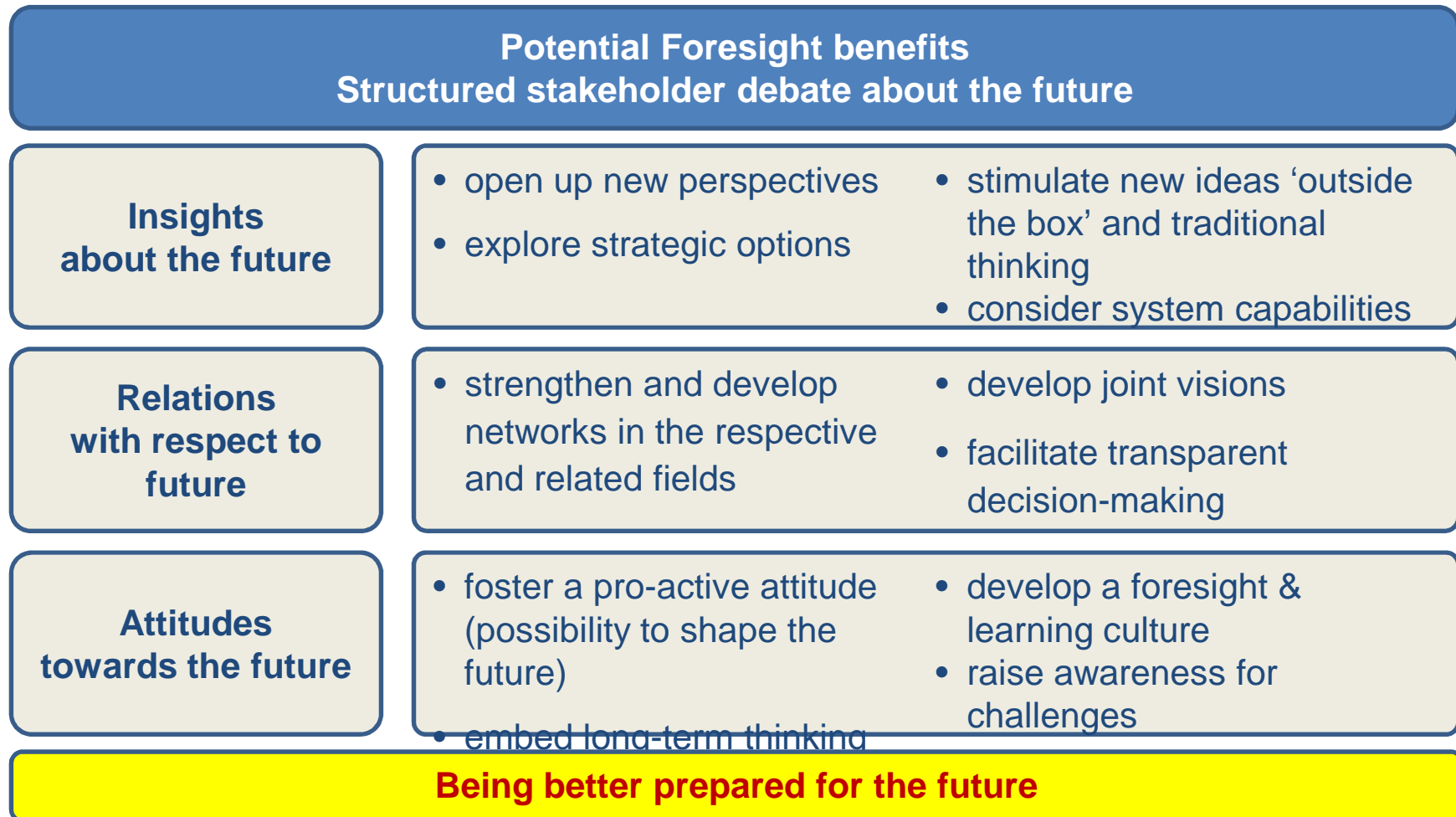
Foresight Training

- Two Modules:
- Module 1: Scoping and Design
- Module 2: Conducting the Forward Look Activity
- Interactive training with examples
- Tailor-made adaptations of methodology

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Potential Foresight benefits



Have a bright future!