

# Innovation Futures: How will we innovate in the future?

New Challenges for Economic and Business Development - 2014

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Karl-Heinz Leitner

# AIT Austrian Institute of Technology

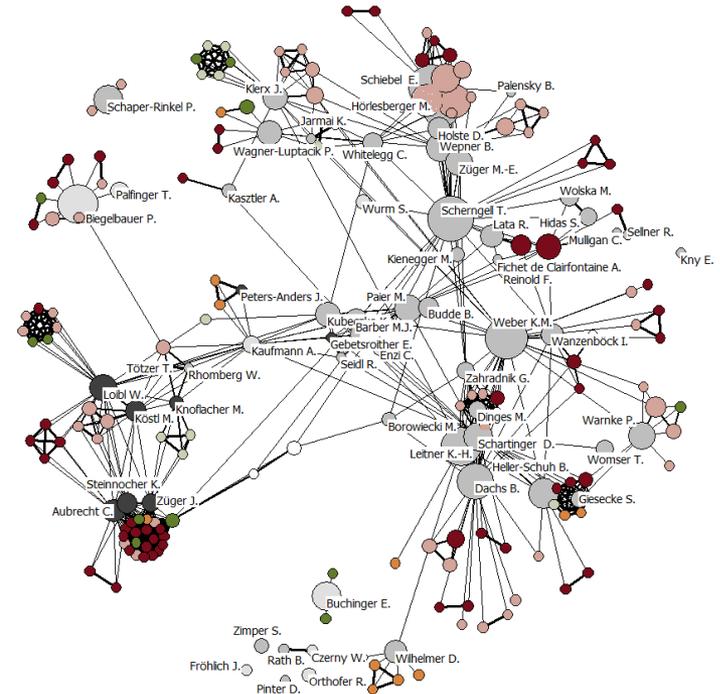
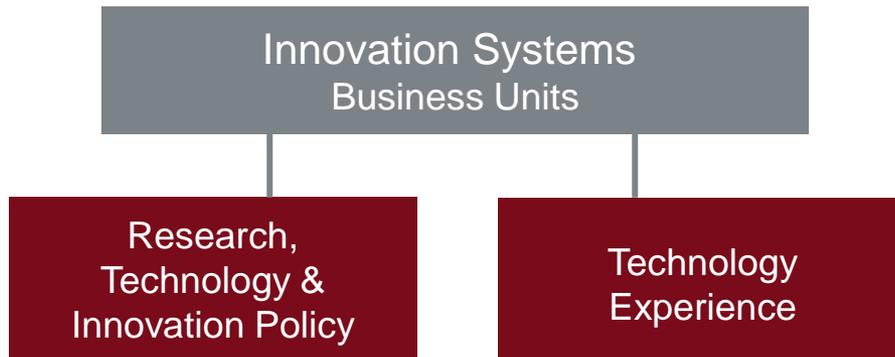
- **Mission**
  - Applied research and development of infrastructure related technologies
- **Owners**
  - 50.5% Republic of Austria  
Federal Ministry for Transport, Innovation and Technology
  - 49.5% Federation of Austrian Industries
- **Employees:**
  - 900 plus 200-250 on contract basis, thereof 95 PhD students
- **Departments:**
  - Energy
  - Mobility
  - Safety & Security
  - Health & Environment
  - Innovation Systems



# Innovation Systems Department

Mission: Socio-economic innovation research concerning the grand challenges of the future

- 50 employees
- 20 PhD- and Master students per year
- 150 bis 180 cooperation partners
- 5.4 Mio. EUR  
thereof 2.9 Mio EUR external



# The INFU Project

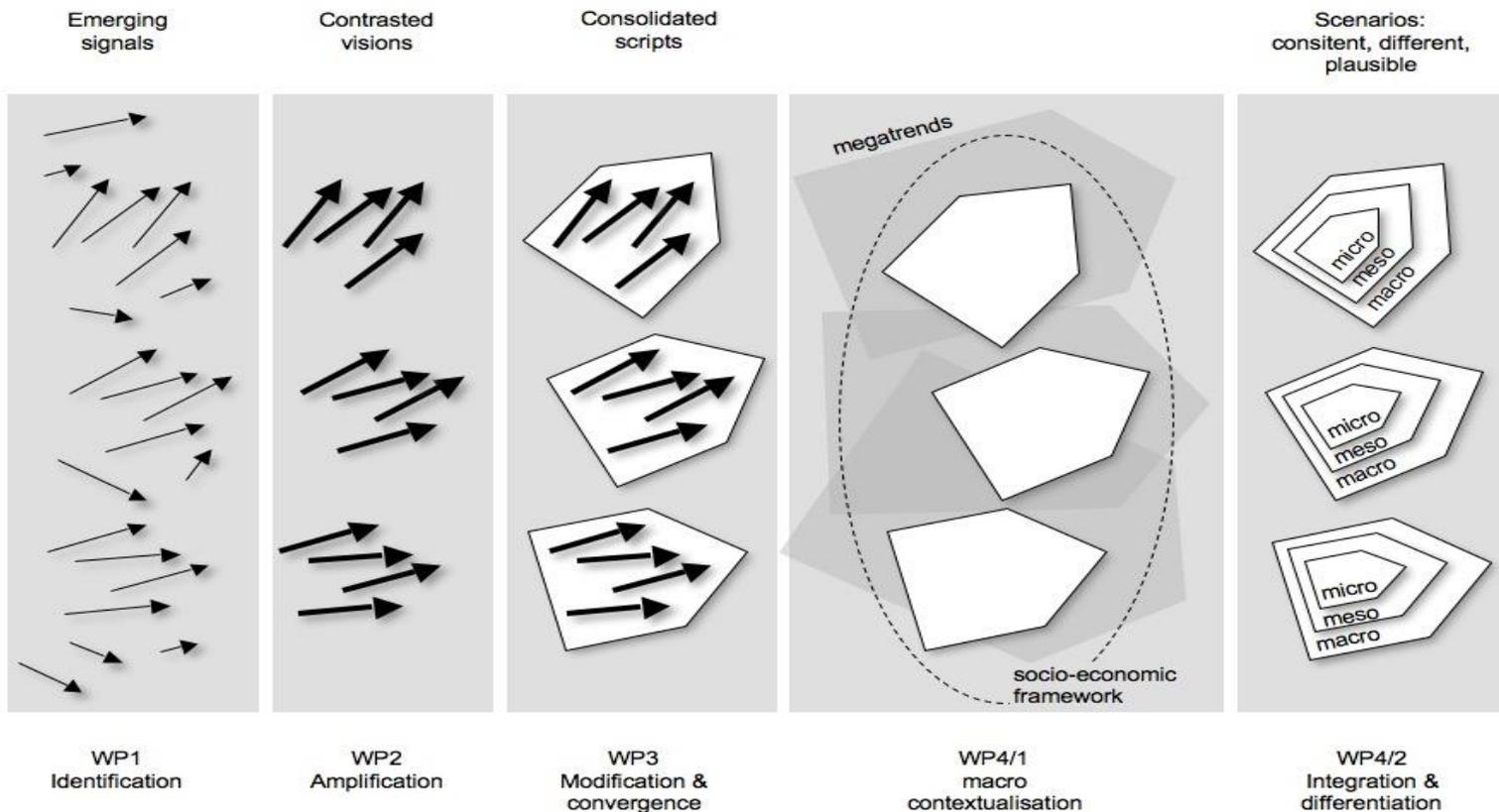
- New forms of innovation have been proposed in the past: open innovation, user innovation, design innovation, social innovation, frugal innovation
- But, there is little systematic exploration of new innovation models and visions and their implications for the innovation landscape, economy and society
- We are interested in the process of innovating, which though, is often related to the intended outcomes of innovation activities
- We have a broad understanding of innovation:  
“Innovation is the creation of new products, processes, technologies and services that are accepted by markets, governments and society.”



# What is Foresight ?

- *„The process in systematically attempting to look into longer term future of science, technology, the economy and society with the aim to identifying the areas for strategic research and emerging generic technologies likely to yield the greatest economic and social benefits.“ (Ben Martin 1993)*
- Foresight assumes that there are many futures, and through the mobilisation of interested stakeholders it is feasible to develop a fuller understanding of the forces shaping the long-term future.

# The Process: From Weak Signals to Visions and Scenarios



# Identification of signals of change

copy me  
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remix me  
INSTITUTE  
NOLOGY



ISEU / Designing energy saving practices



In-NO-vation



iti  
INCI  
Innovation network corporation



IDEASTORM  
High Transparency at Dell Idea Storm



Reduced Security Control to Push Innovation



Google  
Google / Institutionalising the Free Creativity



Fashion Blogs / Diffused creativity



Boom in Crowd Sourcing



Scientific Open Online Platforms for Widening Researchers Communities



Top-Secret Innovation



Tata Jagritiyara / Relocate the Young Indian Entrepreneurship to the Local Scale



Sample Lab / Tryvertising



BILDR / Building Modular Know-How



Design Council  
RED - Open Health



High Prized Open Innovation Competition



Fab Labs / Fabrication Laboratories for Everyone



Career and Community Site for Creative Professionals



TATA  
TATA / Innovation Part of Corporate Culture



Support for Fairness and Ethical  
Demand for More Open Patent System



Reverse Innovation



Re-Design



Real-Time Social Search



CoWorking houses as creative hubs



Crowdsourcing at the White House



Treadless / Typetees



ARDUINO / Open Hardware



24H of Inn  
24h innovation marathon



Rapid Innovation Testing



Demand and Supply Driven Innovation Policy



American Apparel / Insourcing



Creative Communities for Sustainable Lifestyles



Virtual Innovation



Immersion in Public Institutions to Stimulate Innovation



Design Thinking in MBA Programs



Save our Energy



Systems of Living for the Cité du Design



Fusion of Product and Service Innovations



Product Piracy Cases



Software Support Tool for Product Innovation



Future Concept Lab



Conifer / Ethnographic Research Approaches in Design



Social Innovation in Uganda



PONOKO / Everybody designs



Designed Randomness



MINATEC / L'atelier Arts & Science



Bar Camps



Fully Sponsored Innovation Camp for Young People



SPEC YOU!  
The Rise of Spec-Design Sites



Biotech boom in china



No-Innovation as a Design Guideline



MIND LAB  
User Innovation Knowledge.



oscar  
The Open Source Car



LEGO Digital Designer



Cradle to Cradle



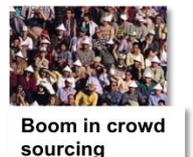
Global Ideas Bank



Activating the Neighbourhood



IVC  
Israeli Model / Governmental Supported Start-ups



Boom in crowd sourcing



Enabling Cards



Edison / Match-Making for Innovators and Companies



Low Cost Car from India



E-Courses for Becoming E-Mentors



DOTT / Design to Support Social Change

# Amplification of signals to construct visions

## Selection of signals



## Amplification of selected signals



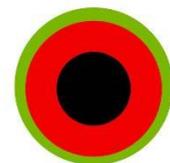
**Transfers** to other sectors, to other user groups...

e.g. from fashion to furniture industry; elderly people instead of kids or vice versa...



**Generalisation** as the mainstream practice...

e.g. what if active users involvement in innovation processes would become the default...



**Radicalisation** of the principle...

e.g. what if the entire innovation process is externalised to a user community...



**1\_Bringing outside in...**  
What if the idea creations process is fully externalised?



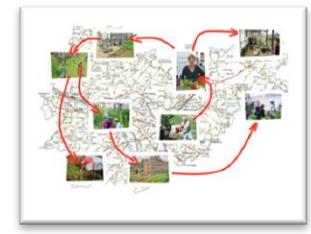
**2\_Innovation on request...**  
What if companies generated innovations from user communities?



**3\_Negotio-Vation...**  
What if innovation became publicly negotiated?



**4\_Innovation Marketplace...**  
What if companies externalised innovation to an open innovation marketplace?



**5\_Public Experimentation...**  
What if experimentation was at the core of innovation?



**6\_CiY Create It Yourself...**  
What if people produced products themselves in fabrication laboratories?



**7\_Laboratory Stores...**  
What if stores were to become labs where firms and customers co-developed innovations?



**8\_Open Source Society...**  
What if open source development became an all encompassing innovation pattern?



**9\_Innovation Campus...**  
What if companies collaborated in joint innovation places?



**10\_Innocamps...**  
What if people innovated together in proper places?



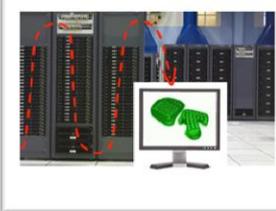
**11\_No-innovation...**  
What if innovation fatigue took over and No-Innovation was envogue?



**12\_Innovation Imperative...**  
What if the emphasis on innovation spread to all workplaces?



**13\_Innovation meets Education...**  
What if innovation skills were on the education agenda of Kindergarden?



**14\_Darwin's Innovation...**  
What if companies used digital systems to randomly create and test innovation?



**15\_Web-Extracted Innovation...**  
What if we scanned the internet for ideas and automatically picked the best ones?



**16\_Virtual-Only Innovation...**  
What if many innovations were enjoyed only virtually?



**17\_Waste-based Innovation...**  
What if the principle of "Waste equals Food"/"cradle to cradle" was widely adopted?



**18\_Relocated Innovation...**  
What if the bulk of innovation were to come from today's emerging markets?

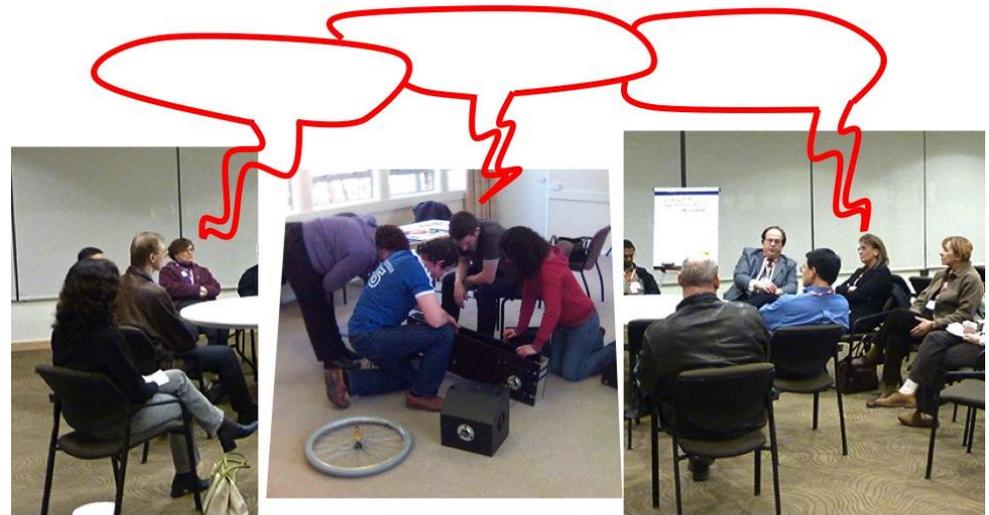


**19\_90% Innovation...**  
What if innovation was directed at population living in poverty?



**20\_City driven Innovation...**  
What if cities became stronger actors in the field of innovation?

## Innovation on request...



What if companies generate most innovations on special request from user communities?

Communities of users develop together with sociologists, designers and developers innovations and sell them to companies.

# CIY – Create It Yourself...



What if fabrication laboratories for everybody with flexible manufacturing equipment, become widely available and allow people to produce ever more products themselves?

Self-production of personalised objects is the standard way of producing commodities directly at home or in “create it yourself shops/malls”. Companies just deliver materials, components, equipment and design tools. Brands do hardly play a role any more.

# Open Source Society...



What if open source development is no longer limited to software development but becomes an all encompassing innovation pattern?

Many products and services are provided by people contributing bits and pieces to various technological and social innovation projects. Open source business models and coordination mechanism abound.

# Web-Extracted Innovation...



What if we scan the internet for ideas and automatically pick the ones that best answer to current customer needs?

Sophisticated semantic web-filters track changes in consumer preferences and new ideas in real time, and automatically extract innovations with outstanding market potential.

# Innocamps...



What if innovation camps, where people gather for a few days to innovate together, become widely established as a means of problem solving?

Innovation camps are used by companies, public sector and civil society to solve problems from high-tech challenges to neighbourhood facilities. Most people do regularly join innovation camps.

## Relocated Innovation...



What if the bulk of successful and disruptive innovations were to come from today's emerging markets?

The West adopts the role of a follower and has to face products primarily designed for different cultural context. Western companies wishfully look to Asia, often with the help of industrial espionage. Creative people migrate to the new innovation hot spots in Asia and send back their money home to the US and Europe.

# 90% Innovation...



What if innovation was primarily directed at the “other 90%” of the world population living in poverty?

Extreme low cost/high innovation strategies prevail. Rich world companies struggle as they lack the competences and culture required. Innovators from today’ emerging markets do much better due to their longstanding experience.

## Waste-based Innovation...



What if the principle of “cradle to cradle” was widely adopted?

Instead of raw material databases with used components and materials serve as a starting point for innovations. The whole world becomes one eternal circle. Everything that is made of something is part of making something.

# Assesement and consolidation of innovation visoins

- Evaluation of 20 visions in an online survey (60 participants) according to clarity, newness, impact, desirability, likelihood
- Discussion with 20 experts from industry & academia

Clustering & Selection

**Outcome: Eight consolidated visions were elaborated in Mini-Panels across Europe by self-organised expert groups involving more than 80 experts**

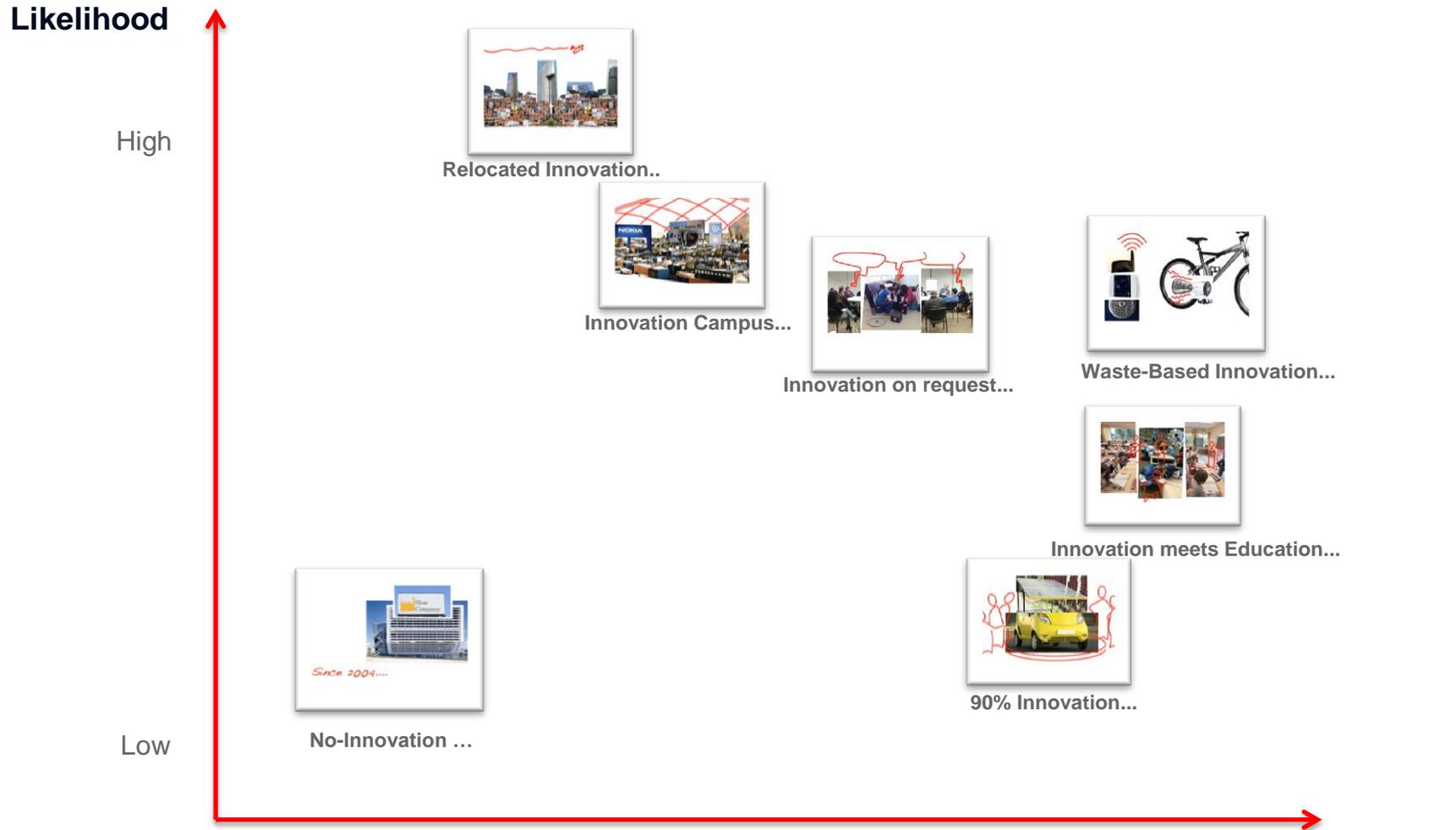


# Characterisation of visions

Innovation initiative	Demand driven						Supply driven
Innovation's relation to production	Separated				-		Integrated
Innovation involvement	Specific		-				Diffused
Innovation intensity	Speeding up						Slowing down
Innovation specificity	For everybody				-		Highly specialised
Innovation skills	Specialised						Diffused
Innovation location	Inside	-					Outside
Innovation openness	Open				-	-	Closed/Secret
Innovation gravity	Centralised	-					Distributed
Innovation continuity	Permanent				-		Occasional
Innovation accessibility	Free					-	Private
Innovation tangibility	Tangible					-	Intangible
Innovation motivation	Profit/Benefit		-				Normative/Mission-driven
Innovation economic model	Classic						Novel
Innovator's working conditions	Stable						Temporary
Idea generation mode	Random						Controlled

Size of the balls: number of answers  
 Online survey, N=60

# Assessment of visions



# Empirical evidence for open innovation strategies

- Chesbrough and Brunswicker (2013): Use of open innovation strategies
  - Survey in large US and German firms
  - Open innovation strategies are often adopted by technology-intensive firms
  - 35% of the firms use inbound open strategies, only 8% outbound strategies
  
- Enkel (2011): Motivation for adopting open innovation strategies
  - Study in 159 firms from Germany, Switzerland and Austria
  - Co-operation and interaction with customers and suppliers is done by 44% of the companies
  - Less use of internet-based strategies, e.g. crowdsourcing, toolkits
  - Motivation:
    1. Acceleration of product development
    2. Cost savings
    3. Exploiting synergies
    4. Access to new markets

# Opportunities, risks and consequences

## 1. New forms of coordination and increased participation:

- The role of markets as mediators between innovation supply and innovation demand is losing relevance while communities (e.g. web-based co-design) within and external to the companies are gaining importance
- Citizens gain relevance in innovation both in deciding on innovation priorities and in contributing to the innovation process
- However, too much participation and too little coordination may slow down the innovation process or result in „consensual solutions“ with low innovativeness
- Companies have to initiate self-organisational processes which are more difficult to control

# Opportunities, risks and consequences

## 2. Motivation for Innovation:

- Profit as the main driver of innovation activity is being challenged. Individuals contributing for pleasure as well as social entrepreneurship and social innovation are more relevant
- Companies have to develop new (hybrid) business models (e.g. 3 P Business Models: Profit, People, Planet)

## 3. Eco-Innovation and Grand Challenges:

- Innovation patterns with reduced negative impact on ecosystems are on the rise
- System innovations fostering transition towards sustainable patterns of production and consumption are realised.
- However, fully bottom-up participation alone is not necessarily to bring about the system changes required
- Upscaling, transfer and standardisation are required

# Opportunities, risks and consequences

## **4. Use of technology and software to automatise innovation:**

- More and more innovation steps may become automatized, e.g. by using web crawler to identify ideas or generate randomly product variants
- Challenges for data security and maintenance for true human creativity
- Huge potential for using social web and tools within the company

## **5. Perception of creativity:**

- Creativity may become a key aspect in all professional activities (“Innovation society”).
- However, we have to take care that negative aspects are avoided, e.g. innovation or participation fatigue, pressure on employees
- In some cases we will see less innovation (“overengineering”)

# Opportunities, risks and consequences

## **6. Regional shifts of innovation towards 'GLocalisation':**

- Opportunities for the development of regional, sustainable solutions
- New opportunities on emerging countries with the design of specific and more simple products

# Management of Innovation

- 1. Selection and Focusing:** New innovation models offer a huge potential but require a careful design and strategy which is aligned with the business strategy
- 2. Co-ordination:** Innovation strategy increasingly entails to co-ordinate self-organised networks which are more difficult to control in the traditional hierarchical sense
- 3. Definition of Core Competencies:** Companies still have to define and protect their core competencies and their role in innovation networks and systems

# Policy support for innovation

1. Innovation policy is much more than promoting R&D investments
2. Policy has to broaden its understanding of innovation and should enable a wider participation of many different actors along the entire innovation chain
3. Policy should shape the direction of development towards addressing ‚Grand Challenges‘. Therefore, policy should enable the realisation of transformative system innovations
4. Policy has to adopt an integrated perspective encompassing technological, social and economic perspectives
5. New forms of regulation (e.g. IPR) are needed to foster mindful innovation and avoid negative outcomes of innovation

# Research agenda on innovation

1. We need a much better understanding of different economic, social and environmental impacts of new innovation model: innovation is neither always good nor became more simple
2. We need a better understanding how to align the innovation strategy with the business environment and business strategy (contingency perspective)
3. We have to understand much better the dynamics of innovation networks and how to shape and steer them

## We altogether will shape the direction of development ...

- Companies: Innovate not just for aiming profits but also to meet societal and ecological needs
- Citizens and customers: Use the opportunities to participate and thereby shape the direction of development
- Policy: Allow wider levels of participation, guide the direction of development (“grand challenges”), perform the role as regulator, and serve as mediator for system integration

# Information and contact

For more information, publications and videos see:

[www.innovation-futures.org](http://www.innovation-futures.org)

Dr. habil. Karl-Heinz Leitner  
AIT Austrian Institute of Technology  
Innovation Systems Department  
Donau-City-Strasse 1  
A-1220 Vienna  
Mail: [karl-heinz.leitner@ait.ac.at](mailto:karl-heinz.leitner@ait.ac.at)  
Skype: karl.heinz.leitner

