# Final set of 20 amplified and contrasted visions

## *Deliverable D 2.3 (WP 2)*

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# Table of Contents

# 1. Introduction

The aim of the INFU foresight project is to develop and discuss the implications of future innovation patterns. Innovation patterns are defined as the underlying principle how the innovation process is organised. Although new innovation models such as open innovation, soft innovation, design innovation or user innovation have been discussed intensively in recent years, there is little systematic exploration of possible future innovation landscapes and their implications for economy and society. [1]

This document presents the final set of 20 amplified and contrasted visions showing emerging patterns of changing innovation processes and is a important output of work package 2 entiteled 'Signal amplification'. In the first step of the INFU project 79 "signals of change" were identified based on a review of the academic innovation literature and by scanning various media and sources such as news papers, magazines and the internet. Based on this collection of innovation patterns which are already apparent and visible but have not yet reached the mainstream and may have even disruptive impact for industry, economy and society, the team has generated 20 visions. Thereby some common principles for the amplification were used and signals were refined, clustered, selected or combined into coherent visions. For this process the team developed a specific template which will be introduced in this report, too.

The following 20 visions have been generated:

- Externalisation of the innovation process
- Public experimentation
- Virtual innovation only
- Deliberative innovation
- Demand-pushed innovation
- No-Innovation
- Innocamps
- Innovation targeted for the other 90%
- Bringing outside in
- Open source society
- Do-it-yourself
- All innovative employees
- Innovation marketplace
- Evolutionary simulation of innovation
- Internet scanning for innovation
- Innovation education starts at kindergarten
- Regional shift in innovation gravity
- Waste-based innovation
- Laboratory department store
- City-driven innovation

[1] See also www.innovation-futures.org for further information on the project, deliverables and the project structure.

In the next step of the INFU project these 20 amplified signals will be discussed with a wider stakeholder audience by conducting interviews and organising mini-panels.

# 2. The amplification process

The main objective of the work package 'Signal amplification' is to pick up the observed signals of work package 1 ('Signal identification') and to developed and extrapolated them into consistent visions. The resulting set of visions should illustrate a range of alternative innovation patterns to the mainstream innovation practices which will be tested with respect to their wider applicability and disruptive potential in the subsequently work packages of INFU.

## The process of generating amplified visions

The procedure to generate the amplified visions followed by the INFU project team can be described as follows[2]:

**Step 1:** Two different templates for amplifying the signals were developed to start the process: i) an 'initial amplification template' which should allow to present draft amplification ideas and to discuss them, ii) a 'final amplification template' which should allow to generate a more detailed description of a short list of amplifications.

**Step 2:** Within a creative amplification process a large number of first visions was created by selecting single signals but also by clustering or combining a few specific signals (out of the 79 signals collected in total in the first work package of the INFU project). So about 40 amplification ideas were developed whereas these signals were selected based on their potential disruptive impact aiming to cover many different patterns and areas at the same time.

**Step 3:** A first review of the collection of the amplified signals enabled a discussion both in terms of uncertainty and potential impact. This was a creative process which enabled enrichment, improvement and generation of new ideas and could be understood as divergence phase. No amplification ideas were rejected at his stage.

**Step 4:** A one day workshop with the all consortium was organised aiming to discuss the completed initial amplification templates. The main aim was to have a creative and enriching review process where i) potential weaknesses and similarities of amplification ideas were discussed and subsequently the visions were improved and enriched, and ii) a set of amplification ideas was selected with the aim to keep the most robust and challenging ones (convergence phase). The criteria used for the final creation and selection were 1) redundancy, 2) possible impact, and 3) coverage of different areas (private/social/public innovation).

**Step 5:** The final list of amplification ideas was elaborated by the team based on the final amplification template (see below), justifying their origin and reference, current emerging form, reasons for possible development, etc. and presenting them in a highly communicative form. Accordingly, a visualisation of the amplified signals was done.

[2] The amplification process as detailed in the project plan of INFU has been fine tuned in the course of the generation of visions. In particular, the importance at the beginning of a free creative amplification process, prior to any organisation of the weak signals collected was underlined.

### *Three principles of amplification*

The amplification process was mostly inspired by the collection of weak signals generated in work package 1 but also the 'dimensions of change' (see 'Dimension of change' below) developed in order to describe, systematise and explore the signals.

The amplifications started in Step 2 in a free and creative way by following the three principles for amplification which should prompt and facilitate the research of early amplification ideas.

Three principles have been defined:

**Transfers** to other sectors, to other users 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 user involvement in innovation process developed into an innovation actively developed by the demand...

In addition, pictograms have been created in harmony with the corporate image of the INFU project to picture more clearly the different patterns of amplification. 'Generalisation' pattern is of the same nature as the 'transfer' pattern but one step further: when transfer has happen to many sectors, user groups, places, etc. the focused change in innovation process could be considered as generalised to the mainstream. On the contrary, the 'radicalisation' pattern is of different nature and intends to explore if the dimension of change considered could be brought even further and more extreme.

It has to be noted that these three patterns were particularly helpful in organising the first list of amplified visions. The process of clustering, combining, selecting, etc. of these initial 40 visions (step 4) then revealed that the pattern “Transfers” could be seen in most of the cases as a sub-category of generalisation and/or radicalisation. Therefore, the final set of twenty amplified and contrasted visions below is described exclusively as a radicalisation or as a generalisation of the previous signals.

## Dimensions of change

To characterise the different visions in more detail and to allow a more elaborated discussion of the possible impacts and dynamics of change, 16 different dimensions were defined. These criteria should allow to capture the various innovation patterns and whole range of different characteristics taking into account findings from the innovation literature when ever

possible (e.g. open innovation and closed innovation, demand pull and technology push, etc.).[3] Each dimension stretches over two extreme values; the dimension can hence also be thought as tensions or dichotomies.[4]

- **Innovation initiative**
  Thereby the question of the main driver for the innovation is addressed, traditionally, for instance, discussed by the technology-push versus market pull question. More generally we distinguish between demand-driven and supply-driven innovations.

- **Innovation's relation to production**
  Innovation efforts may be separated from production or highly dependent and integrated with the manufacturing process.

- **Innovation involvement**
  There may be only very specific actors (e.g. developers, managers) who are involved in the innovation process, i.e. innovation involvement is specific, or many different actors may be involved in the different stages, i.e. innovation involvement is highly diffused.

- **Innovation intensity**
  The innovation process (life-cycle) may slow down or speed up in relation to a specific innovation pattern.

- **Innovation specificity**
  Innovations may be developed for highly, specialised markets (niches) or for large, universal (global) markets.

- **Innovation skills**
  Skills which are necessary for developing and implementing innovations may by highly specialised (e.g. within the firm, within the economy) or broadly distributed (e.g. within the firm, sector, or society).

- **Innovation location**
  Innovation may be developed primarily within the organisational borders or outside the organisation.

- **Innovation openness**
  Innovations may be developed within a closed organisational unit on the one hand or and entirely open, networked process on the other hand.

- **Innovation gravity**
  The innovation process may be centralised (within the firm) or highly distributed on the regional/global scale.

- **Innovation continuity**
  Innovations may be developed permanently as an on-going process or occasionally/ discontinuously.

[3] See also Deliv. 1.1 concerning important features which have been used in the academic literature to describe different innovation concepts.

[4] These 16 dimensions will be further refined in the course of the development and discussion of scenarios and visions.

- **Innovation accessibility**
  Innovations may be developed and provided for free on the one hand or may be traded as private goods.

- **Innovation tangibility**
  Innovation outputs (products) may be tangible or intangible.

- **Innovation motivation**
  Innovation may be driven primarily by economic incentives or by may be driven by realising normative missions/ideas.

- **Innovation economic model**
  The rationality of investing in innovation may be based on classical economic (business) models or new models.

- **Innovator's working conditions**
  The working conditions for inventors and innovators may be stable over a longer period of time or instable.

- **Innovation idea generation mode**
  The idea generation mode may be considered as either random on the one hand or planned/controlled on the other hand.

## The amplification template

The final amplification template was developed to create a more detailed description of the final list of amplifications and hence has a few more questions as the initial amplification template (the last one is not presented here).

The first part presents the amplification through imaginative scripts picturing the new innovation processes in emblematic contexts where it may take place (e.g. typical situation in a company research laboratory, a local store, a public procurement service…) and from different stakeholder points of view (e.g. a brand, a consumer association, a user community, a public body…). Thereby a reference is made to possible signals identified in the first stage of the INFU project (see also Deliverable 1.1.: Signals of change) by incorporating small pictograms. The purpose of this amplified vision in form of a small script is to ensure a quick and efficient communication in the following work package 3 ‘Explorative dialog’ where an assessment with external expert will be conducted.

The second part should motivate and explain in detail the amplification justifying its origin and reference by referring to the signals the vision is based on. The majority of visions have been created by integrating and amplifying more than one signal, which though are often similar in their fundamental features. In addition, the current stage of development, rationales for the future developments, risks, opportunities and implications are briefly discussion. Finally, the vision is categorised according to the 16 dimensions of change.

*"Explicit title for the amplification..."*

**Part 1_amplification script:**

_*starting weak signal(s):*

>> Here will be inserted the pictograms of the signals the amplification is referring to.

_*summary text* (less then 100 words) based on 3 parts: an emblematic weak signal, a question introducing the amplification idea and a final vision

>> Here will be inserted the visualisation of the vision.

**Part 2_discussion of the amplification:**

_ *origin and reference of the amplification...*

text…

_*current stage of development...*

text…

_ *future resulting situation...*

text…

_ *level of uncertainty…*

text…

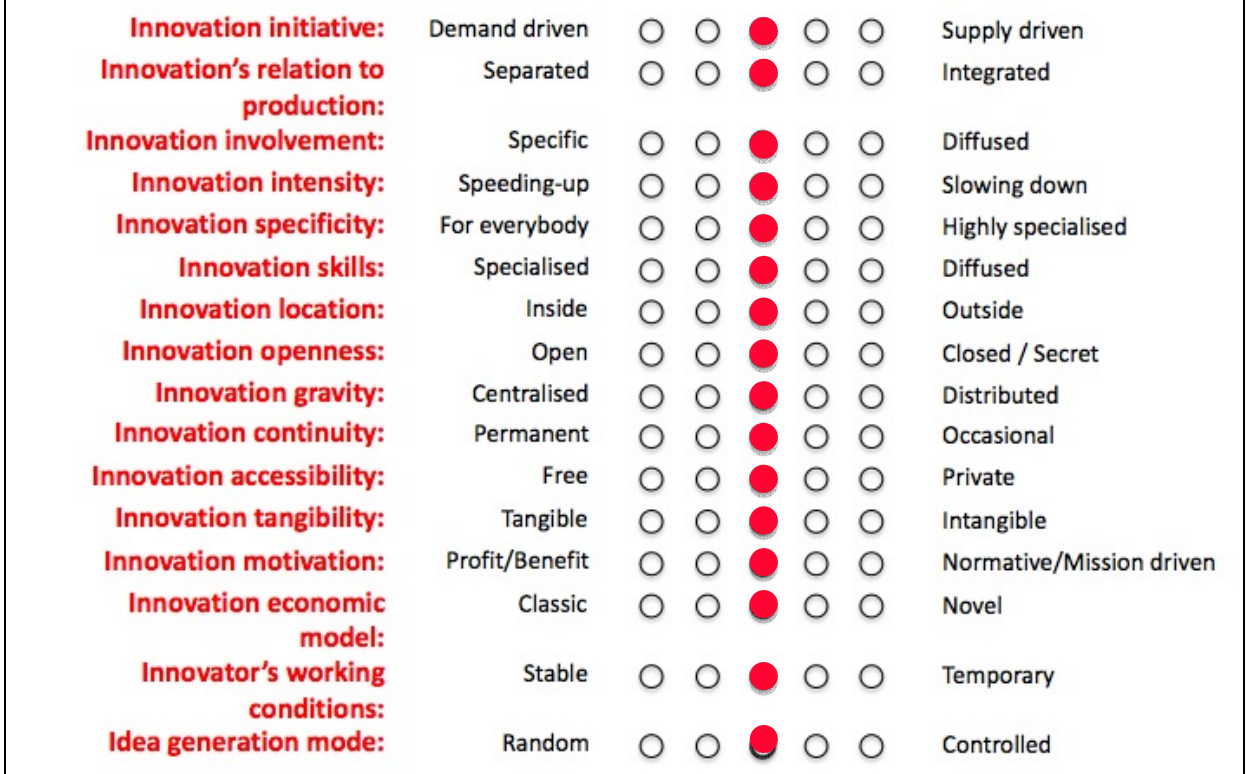
_ *potential impact (opportunities, threats...)*

text…

_ *policy implication/opportunities...*

text…

_ *dimensions of change…*




_ *critical/open questions…*

text…

# 3. Final selection of amplified and contrasted visions

In the following the final set of amplified and contrasted vision is described and presented using the template. The visions are not presented in a specific order.

## 3.1 Externalisation of the innovation process

**Externalisation of the innovation process**

Part 1_amplification script:

*_starting weak signal(s):*


*_summary text*

"Already innovation laboratories are hosting range of developers detached from their companies to take part to joint innovation programs. What if companies would externalise most of their innovation process and staff? Independent innovation plants will rent large open spaces for companies to settle their innovation staff with private areas and all sorts of collaborative facilities in between…"


**Externalisation of innovation process...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

Current experiments are showing a shift in innovation management: bar camps, innovation competitions or innovation laboratories (like Minatec Ideas Lab in Grenoble, France) that invite companies for short or mid-term residences… Companies tend to externalize parts of their innovation activities…

_*current stage of development...*

These externalized activities are growing in number but are still experiments and do not concern the core of the innovation process…

_ *future resulting situation...*

The entire innovation process will be held outside the company… not by the company itself but by independent actors who will provide time and space for innovation facilities; special places which facilitate exchanges and mutual influences between innovation actors.

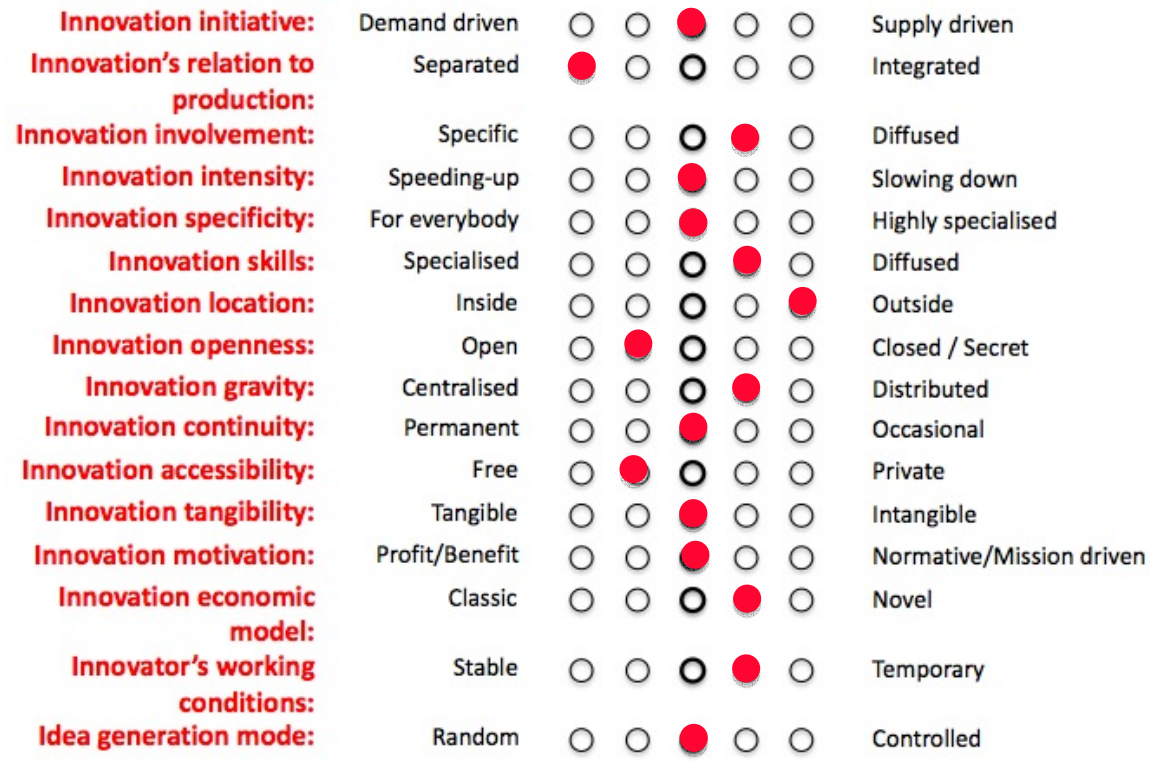
_ *level of uncertainty…*

To what extend will companies externalize innovation and how they will perceive it as an added value?

_ *potential impact (opportunities, threats...)*

Could this level of exchange between innovation actors result in a loss of product/innovation differentiation?

_ *dimensions of change…*



## 3.2 Public experimentation...

**Public experimentation...**

Part 1_amplification script:

*_starting weak signal(s):*


*_summary text*

"Social innovation is more and more regarded as key to stimulate behaviour change and transition to sustainable ways of living. What if public authorities would provide the appropriated context for deployment of social experimentation?
A permanent stage of social experimentation through series of local bottom-up projects diffused on the territory, independents but in synergy will ensure transformation and renovation of mainstream consumption society?"

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

Social innovation is currently increasingly being recognised:

• as a way of addressing societal problems;

• as a way to initiate transformative innovation towards sustainability;

• as a catalyst for successful technological innovation

*_current stage of development...*

Public authorities are progressively giving major visibility and even promoting these bottom-up initiatives

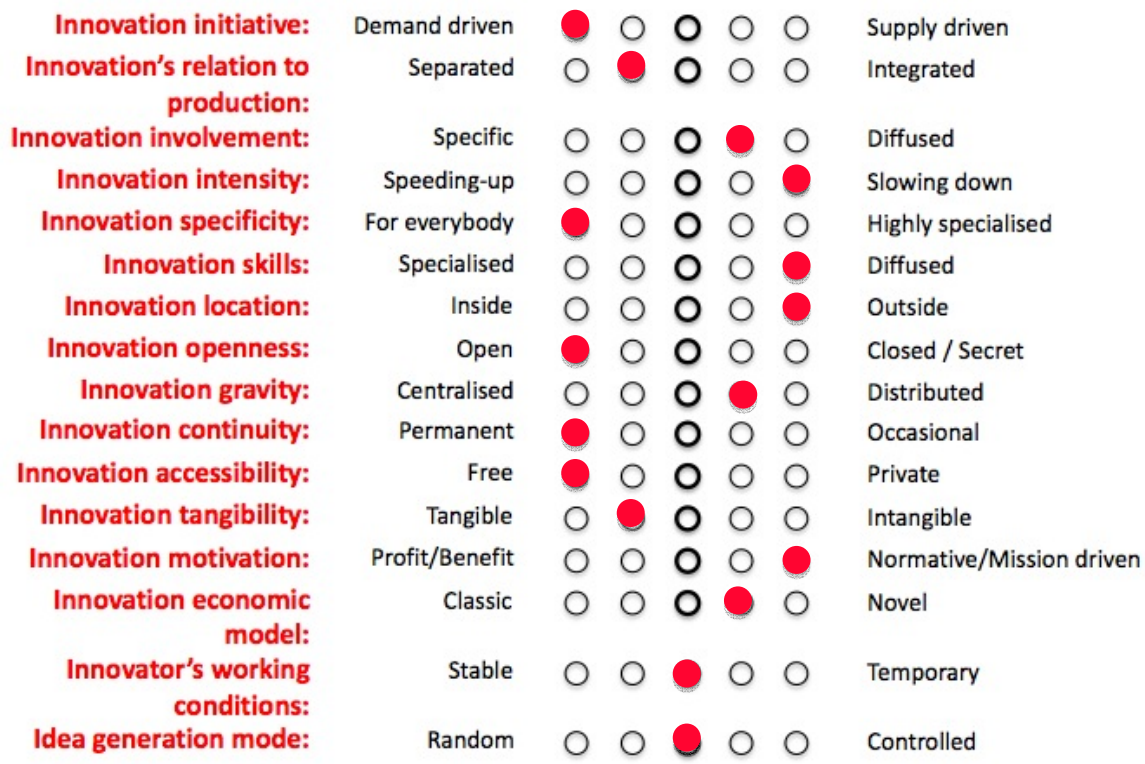
_ *future resulting situation...*

Channelling local innovations could be seen as a new way to set up new territorial policies.

_ *level of uncertainty…*

Difficulty to estimate the follow-up of local initiatives and their potential transfer/diffusion in other areas…

_ *dimensions of change…*



## 3.3 Virtual innovation only...

### Virtual innovation only...

Part 1_amplification script:

*_starting weak signal(s):*


*_summary text*

"…An important part of the current innovation is displayed online on websites organising ranking of good ideas, brokering industrial implementation for the one raising a real demand and leaving the other on display.

What if innovation would be enjoyed virtually and only the small part of very convincing ideas would be realised?

Virtual galleries would allow to enjoy simulations of proposals, debate and share it with other users and satisfy human innovation appetite of newness virtually while sparing resources needed for implementation…"

**Virtual only innovation...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

Digital mock ups, associated with rapid testing and rapid prototyping are becoming far more pervasive and persuasive as information technology improves while testing grows faster and cheaper… Every year, car prototypes are presented to satisfy public desire of newness… But this innovation-driven society triggers negative side effects and, amongst them, the acceleration of product turnover and subsequent booming of superfluous stuffs... Do all of these innovations need to be realised?

_*current stage of development...*

New technologies and the possibilities of digital mock ups make already now innovation processes cheaper and more efficient, as they enable easy testing and evaluation – offline and online. Quantity of products that will never be realised… Why not looking positively at these un-realised products within the innovation context, like those architecture mock-ups from international competitions that are considered great architecture achievements despite the fact they will probably never be built?

_ *future resulting situation...*

It seems that there will be a growing place for 'virtual innovation' which is to say innovations that satisfy appetite of newness without needing to be produced and implemented. Simulations of these innovations accessible online would enable users to assess if this innovation should be particularly implemented or not...

_ *level of uncertainty…*

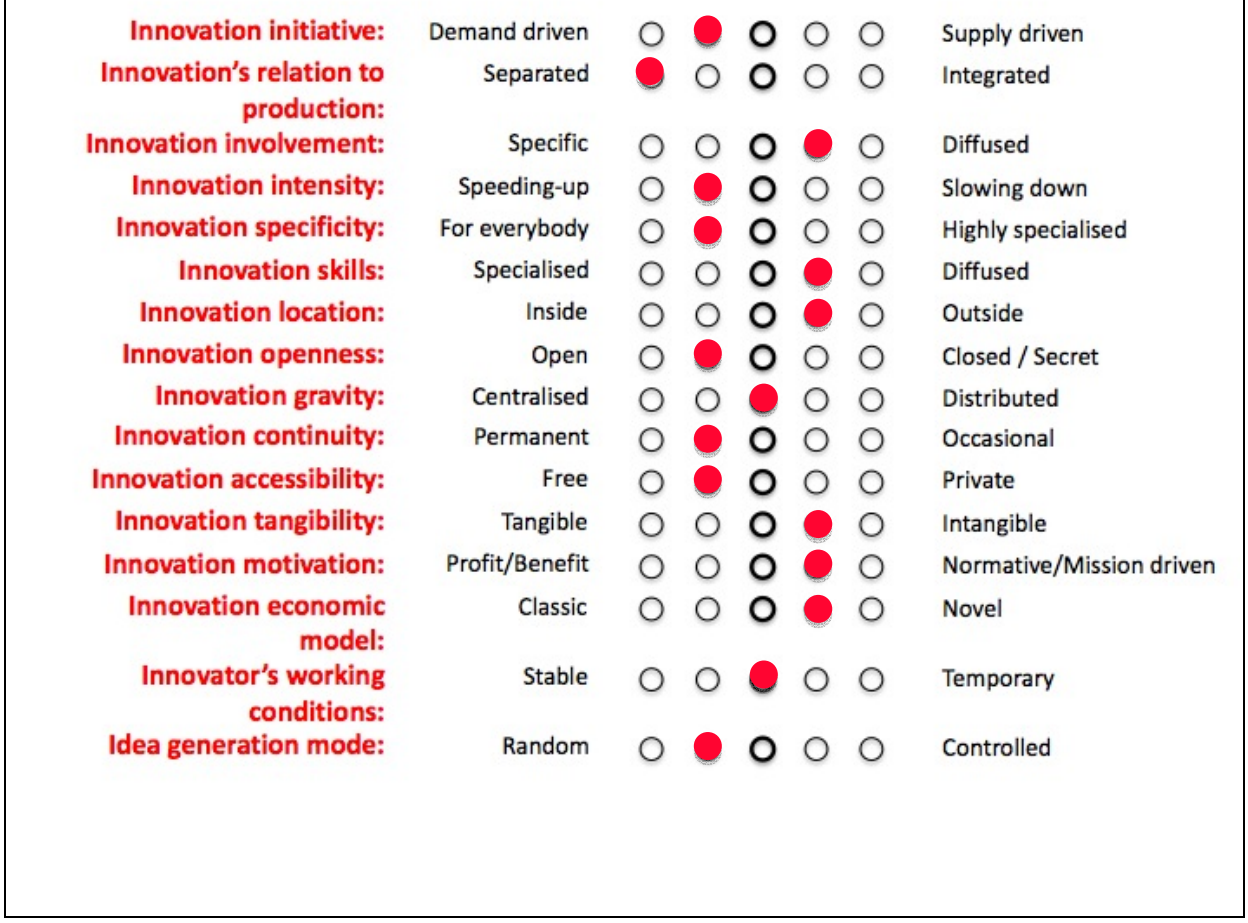
The suggestion seems realistic: for many years “digital mock up” has been developed for the investment product industry. Since the digital testing is becoming cheaper this will diffuse into the customer goods industry. More and more products will become “only digital”…

_ *potential impact (opportunities, threats...)*

Companies are increasingly forced by their shareholders to reduce costs (for innovation processes) and lower the risk of disinvestments, which often bears the risk of less innovation willingness. An answer could be new ways to test ideas at an early stage.

As the benefits of digital mock ups spreads to more and more companies, corporate innovation cultures might change. People feel more motivated to contribute their ideas, new concepts would be tested more often and faster, which would increase innovativeness in general and make it easier to challenge accepted wisdom.

_ *dimensions of change…*



## 3.4 Deliberative innovation

### Deliberative innovation

Part 1_amplification script:

*_starting weak signal(s):*


*_summary text:*

"Public debate on future of technological progress developed through citizen juries and other forms of deliberative processes...

What if companies would provide the appropriated context for deployment of participative processes in product development?

Companies will advertise for innovation proposals to citizens, competing to get 'innovation credits' from them in order to engage the necessary resources for new product development."


**Deliberative innovation...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

The growing importance of deliberative processes as a new democracy technique; involvement of citizens, consumers, politicians, scientists and various stakeholders put together around the same table to discuss major issues for society…

_*current stage of development...*

These participative techniques are less used in the field of innovation. Some companies offer the possibilities to react on their products but this is generally limited to rating and ranking objects or advertisement campaigns…

_ *future resulting situation...*

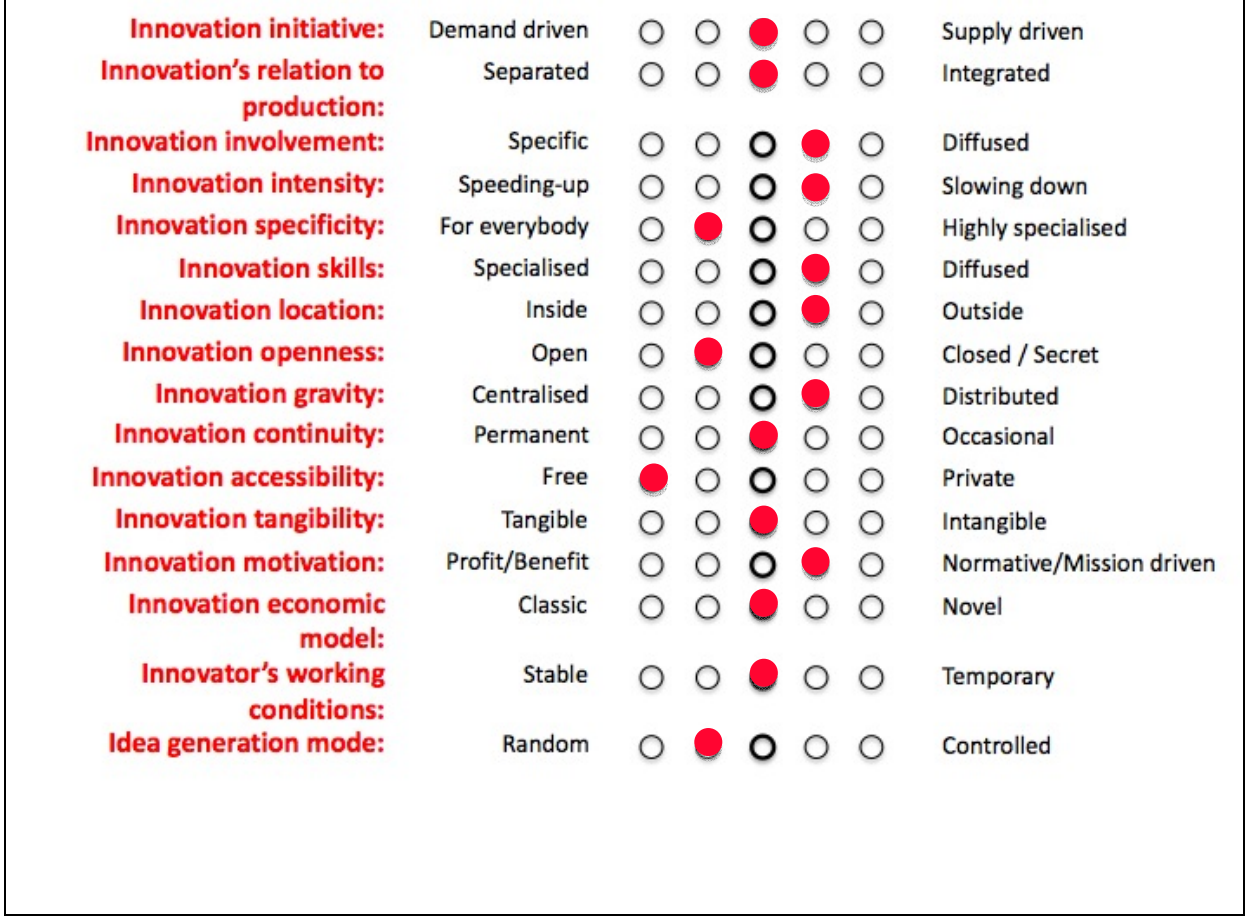
Instead of producing innovation, companies post pre-projects or suggestions of products on the web and ask users to vote and discuss which should be produced. Desirability of the objects as well as ecological impacts, ethical and economic aspects will be then discussed at the same level; responsibility of companies could be traduced in innovation credits to be gained or lost in the way project are promoted and developed, like the current “pollution credits”…

_ *level of uncertainty…*

Competition among companies will probably not function if pre-products are available publically; competitors will catch up the ideas and suggestions…

Are we sure participants of the deliberative innovation sessions are potential consumers as well, i.e., what are the economical guarantees for a company to get engaged in such a process?

_ *dimensions of change…*



## 3.5 Demand-driven innovation

***Demand-driven innovation***

Part 1_amplification script:

*_starting weak signal(s):*

Fab Labs / Fabrication Laboratories for Everyone

ISEU / Designing energy saving practices

*_summary text:*

"Users communities from Alzheimer patients to sports amateurs group to request specific products from companies.

What if public deliberation would be extended to orient innovation effort of companies and public authorities?

Former consumer associations organised communities of users and together with sociologists, designers and developers discuss and develop scenarios of requested innovation and sell them to companies."

**Demand driven innovation...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

The health sector has shown for years now the importance of consumer/patient associations in inviting laboratories and pharmaceutical companies to pay attention to their specific diseases… This trend seems to be progressively verified in other fields…

_*current stage of development...*

There is a growing importance and visibility of consumer associations in the marketplace. One can imagine that the next challenge for those associations will not be to merely criticize afterwards but to be at the forefront of innovation by proposing visions and related products and services…With their specific expertise, they are able to formulate precise needs and suggestions for design and guarantee to the company a sufficient number of potential users…

_ *future resulting situation...*

These former consumer associations will be organised in communities of users and together with designers and developers will discuss and develop scenarios of requested innovation that they will then propose or even sell to companies.

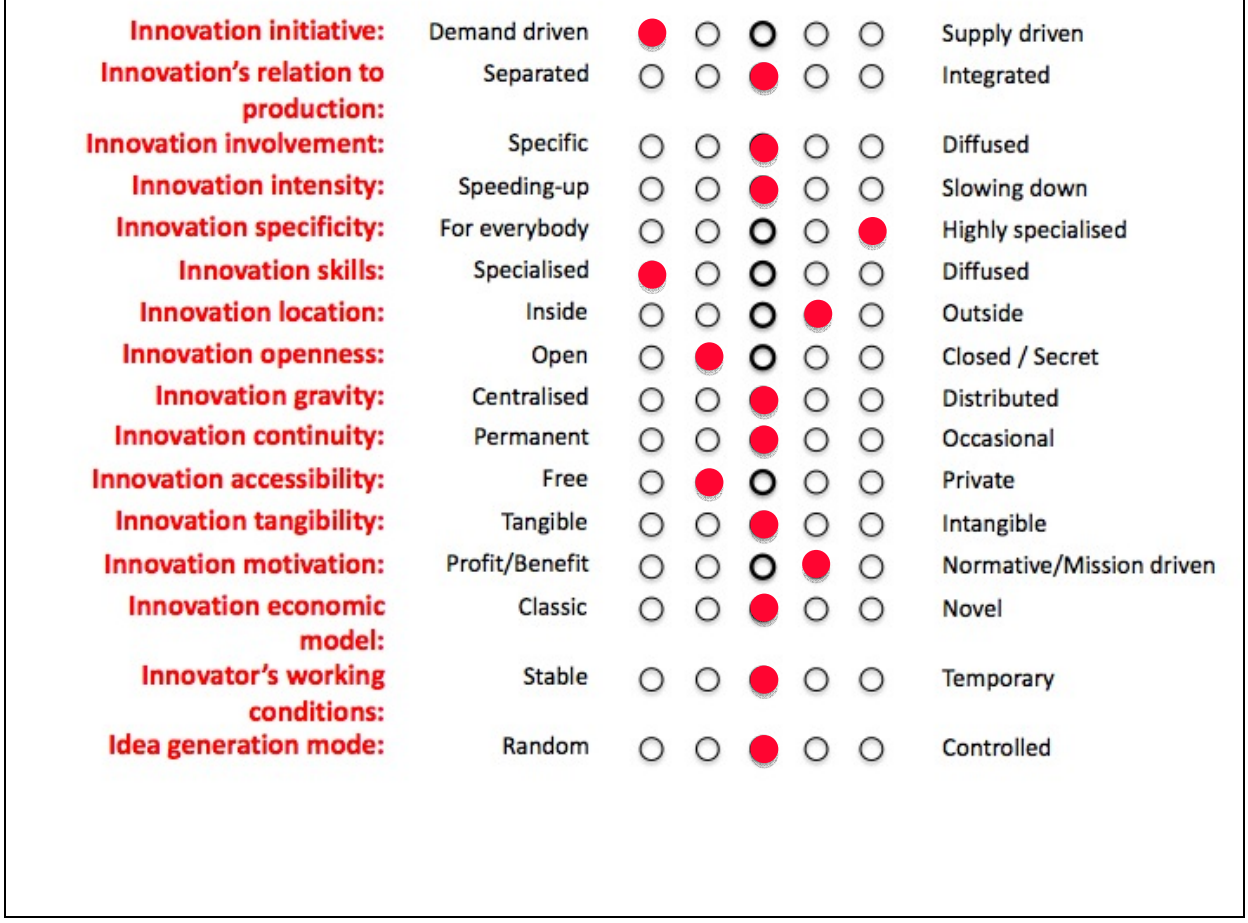
_ *level of uncertainty…*

To what extent will companies let themselves get involved in co-elaborating projects?

_ *potential impact (opportunities, threats...)*

Instead of looking for newness, the major aim of innovation will be to better answer specific and requested needs…

_ *dimensions of change…*



## 3.6 No-Innovation

***No-Innovation***

Part 1_amplification script:

*_starting weak signal(s):*


*_summary text:*

"The American Cereal Manufacturer Post came up with an Anti-Innovation campaign, which concentrates on the fact that POST cereals have never changed. This case shows a counter trend in some industries and product markets where certain products will deliberately remain unchanged which are though highly competitive. Therefore, innovation belongs to the past, the future belongs to unchanging quality: people and firms have freed themselves from the chains of innovation culture."


Since 2004....

**No-innovation...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

There is strong increasing innovation competition and further shortening of product life cycles, however, there will be a counter trend in some industries and product markets where certain products will deliberately remain unchanged which are though highly competitive. The American Cereal Manufacturer Post, for instance, came up with an Anti-Innovation campaign, which concentrates on the fact that POST cereals have never changed.

_*current stage of development...*

Although innovation is a key competitive advantage for many firms in almost all industries in highly developed economies some companies have started to rethink their innovation strategies.

_ *future resulting situation…*

A fast growing number of people deliberately renounce attempts to buy innovative products - they are sick and tired of things changing constantly. Even though companies do not resist on innovation completely, they deliberately focus on long innovation cycles by emphasising the no need for innovation of already "perfect products". If companies innovate then they hide their efforts to make the product look like as being unchanged (e.g. Rolls Royce). There exist product markets for "slow down products", particular in consumer markets (living, eating, relaxing, etc.). As a consequence corporate culture is also changing with less pressure to innovate permanently. Society has had enough from the exhausting competition, which asked too much from the people and even drove them into suicide.

_ *level of uncertainty…*

It is in fact true that many companies consider quality being at least as important for competitiveness as being innovative. At the same the race for innovation is cost intense and can`t be won by all. The "loosers" might find other strategies that look more on local markets, quality and existing functionality that reduce complexity and give certainty in use for costumers. Additionally, where does the race end, will there be a break down of the "Innovation paradigm"? What is the benefit for customers, can we guarantee "High value added" forever?

There are also factors, which makes the vision unlikely. Innovation is for international oriented economies the way to be distinctive to competitors. There is not much space for other strategies to go for, especially in modern high cost economies where economies of scale in commodities become less attractive in the light of international, global competition. Moreover, incremental innovations coming from emerging economies, e.g. China and India will catch up with European ones, maybe overtaking, which accelerates the innovation competition.

_ *potential impact (opportunities, threats...)*

We can imagine a number of different impacts:

Economy: Change in economy structure, focus is on innovation in processes to ensure especially quality and efficiency but not new "High value added" in products.

Social: People enjoy good quality in less "speedy" private surroundings, but at the same time are forced to be very productive and efficient.

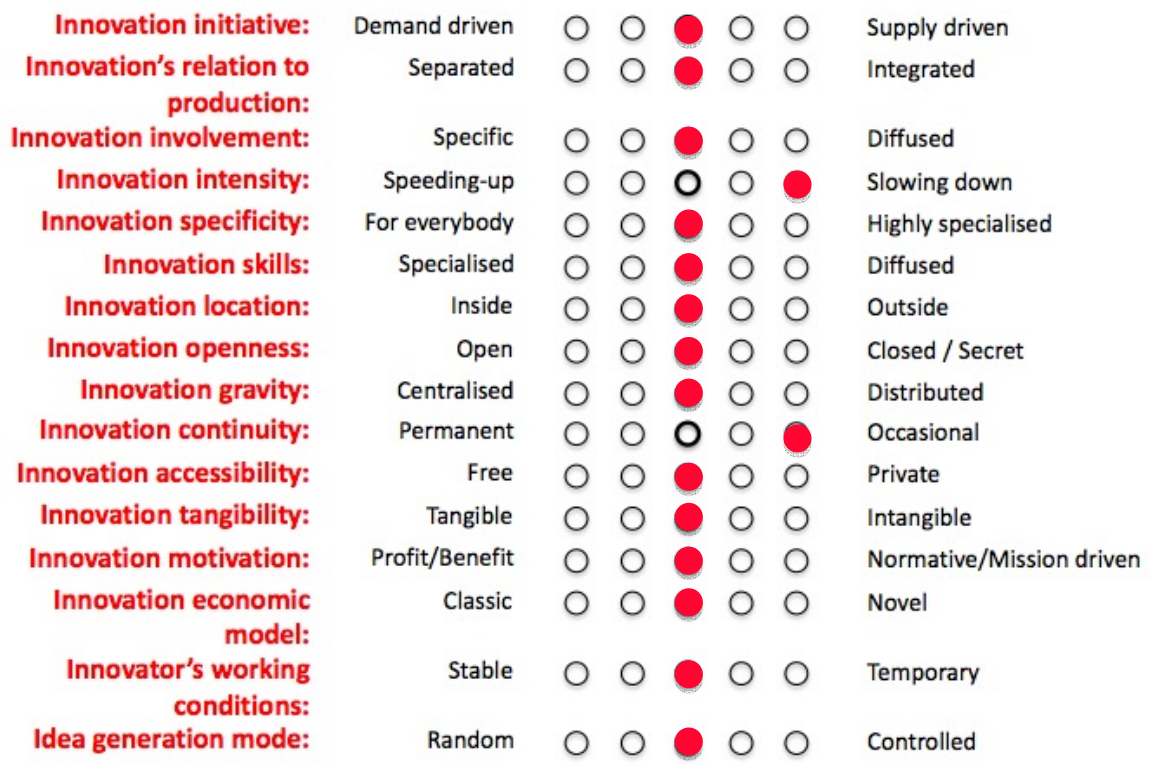
Ecology: The drop down of innovation culture is accompanied by longer consumption cycles and therefore less waste. The focus on efficient production processes ensures high quality, which in turn, ensures also high resource efficiency.

_ *policy implication/opportunities...*

There is less opportunity and need for policy making within this scenario context with the consequences of a need for re-dimensioning of policy making. Other policy areas become more important to support growth and competitiveness of industries.

_ *dimensions of change…*

The following dimensions of change are relevant:




_ *critical/open questions…*

The following questions might be of further interest:

Which industries can afford not to innovate? Is it possible that in the future there are more "perfect" products, which can hardly be improved (costs, product features, quality, etc.)? Does the differentiation of the society evoke the need for "traditional no-innovating products"/"continuity of products"? What are the factors of the product markets (technology, autonomous products, etc.)?

## 3.7 Innocamps

# Innocamps…

Part 1_amplification script:

*_starting weak signal(s):*


*_summary text:*

"Innovation camps like bar camps or fully sponsored innovations camps bring creative and young people, starting in ground school up to adulthood, physically together in order to develop solutions for social challenges and exchange and create ideas for products and services they wish. This is also to foster innovation culture and support national competitiveness in the global race for innovations. In the end, innovation camps are an established format to collect ideas of young talented people. They are systematically integrated in the education system as new means to foster innovation culture."

Innocamps...

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

Companies and NGO already involve young and critical creative people in their innovation and campaign processes, organized in an inspiring and fancy surrounding (urban and / or digital). They invite them to „camps“ in order to collectively work on solutions and questions they are interested in or the facilitator asks them to do so.

Therefore, in the future Innovation camps like bar camps or fully sponsored innovations camps bring creative and young people, starting in ground school up to adulthood, physically together in order to develop solutions for social challenges and exchange and create ideas for products and services they wish/imagine. This is also to foster innovation culture and support national competitiveness in the global race for innovations.

_ *future resulting situation…*

'Innocamps' are based on ideas to stimulate innovation such as mixing (different persons/cultures...) or de-contextualisation (changing from place, point of view...). In that sense, such training could take place in education curriculum. Innovation as a topic in curriculum like maths or geography will give more place for creative people than in the current education system.

_ *level of uncertainty…*

An obstacle on this way could be the fact that innovation creates a monopolistic situation for a certain period of time. Keeping the exclusive right on product ideas (Apple) in an open process will be difficult.

_ *potential impact (opportunities, threats...)*

We can imagine a number of different impacts:

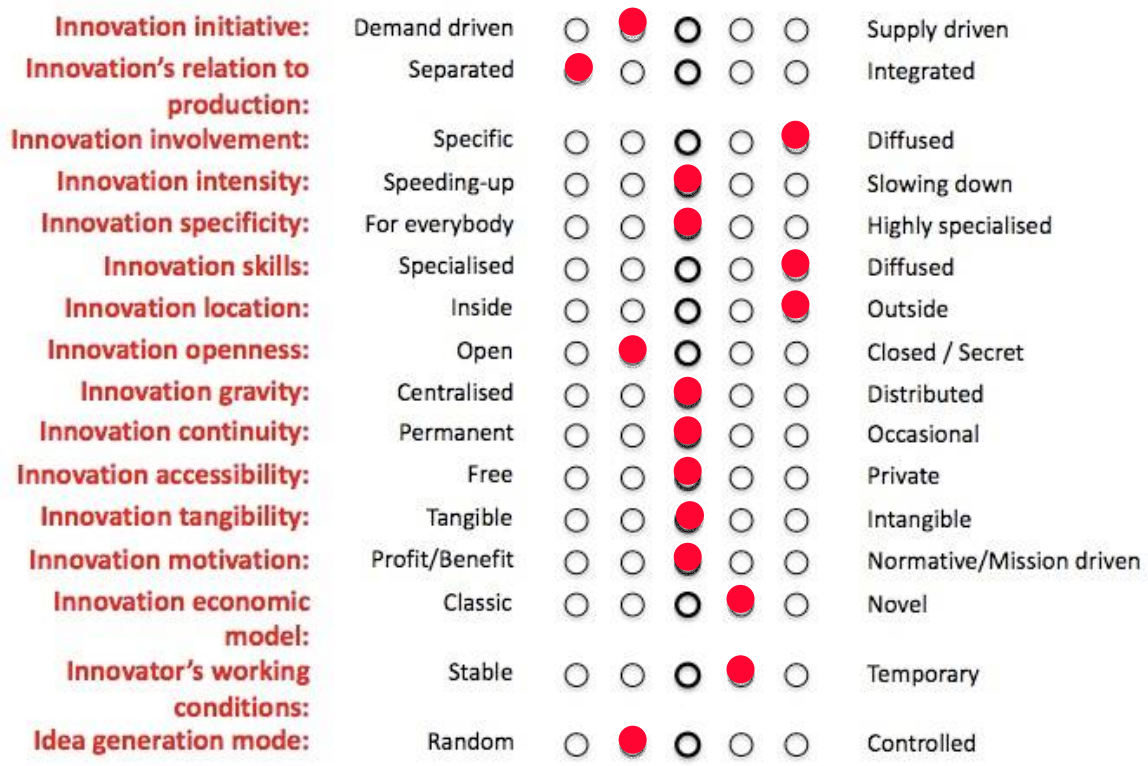
Innovation camps are an established format to collect ideas of young talented people. They are systematically integrated in the education system as new means to foster innovation culture, and to increase interest in science and research in order to meet demand from knowledge based industry. The participation is organised as a reward for young people that have been participating in contests before. The camps give also way to future perspectives and personal development (career, grants, job, education, etc.) chances.

Companies innovations processes could be totally externalised in the form of creative workshops focused on emerging topics joined by participants form all sorts of backgrounds and organised by third independent parties. New companies will then immerge being responsible for the innovation process. Other companies will focus on the production process and externalize the innovation process. Companies could also use this type of “open innovation” for basic research and start from there on the specific product development.

_ *policy implication/opportunities...*

Innovation policy can support and enable the establishment of innovation camps in many areas and has to co-ordinate with other policies such as education policy. By providing infrastructure (e.g. future centers) policy can provide incentives for organising innovation camps.

_ *dimensions of change…*




_ *critical/open questions…*

The following questions might be of interest to be further discussed:

Are companies still the right place to think outside the box, beyond business as usual and start breakthrough innovation? For which types of groups are camps particularly relevant? What are their incentives? Is this a way to integrate innovation culture in schooling and education systems? What is a useful follow up of such camps? Does it make sense to institutionalise such camps and to "oblige" to participate? Is this a means to pick talents crossing social barriers?

## 3.8 Innovation targeted for the other 90%...

**Innovation targeted for the other 90%...**

Part 1_amplification script:

_ *starting weak signal(s):*


*_summary text:*

"Extremely low cost strategy like the current low cost car TataNano from India allows to serve markets in economies with low national income, which, though, requires high innovation input and efficiency. This challenges also the current belief that low cost strategies are incompatible with product innovation. Established companies may oversee this disruptive innovation, especially Western firms have more difficulties to adapt and compete with companies from developing countries that always had low cost strategies in focus. In this sense "Tata is the Beetle of the 21st century on the global scale.""

**Innovation targeted for the other 90%...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

Both low cost product strategies as well as low cost production countries are usually believed to require less innovation efforts, however, producing extreme low cost products (e.g. cars, computers) requires a lot of innovation. At the moment, established Westerly firms (e.g. PCs) but also new firms from emerging countries (e.g. cars) are developing and producing products for economies with a very large population of very low income. These markets are nevertheless huge and will be served in the future by more and more companies, which are – at least to some extent – highly innovative at the same time. However, established companies may oversee this disruptive innovation, e.g. market potential in further low income countries will be served by these new emerging manufacturers.

_ *future resulting situation…*

More and more companies in many industries will serve the new markets with very cheap products which though are innovative to serve the specific needs. This development will also lead to an innovation gravity shift from Western economies to other emerging countries.

_ *level of uncertainty…*

As many companies due to the current economic crises have started to produce low cost products and adapted the product range there is some probability that this strategy becomes a dominant (innovation) strategy.

_ *potential impact (opportunities, threats...)*

We may see the following developments (implications):

Western companies will certainly have more difficulties to adapt and compete with companies from emerging/developing countries that have always had this focus, that are near the demand of low cost, which negative consequences for Europe.

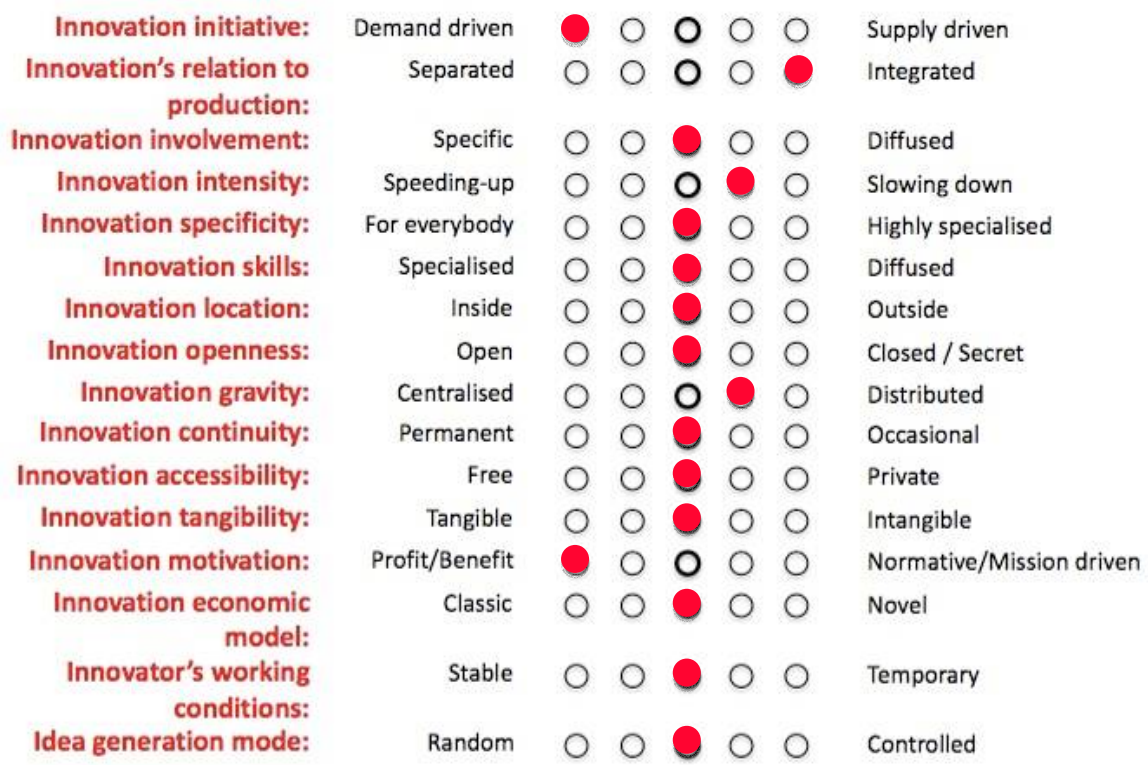
The 'Logan', for instance, has been designed as a 'less-of-the-same' product when the TataNano seems to be both 'less' and 'new/desirable': could we imagine the emergence of new and culturally connoted low cost products (i.e. 'Logan-like revival', 'oriental minimalism', 'design-povera', 'sustainable sufficiency', etc.).

The 'less culture' could both mean sustainability and price reduction but it is more likely that rush for price reduction in less controlled/sustainability aware contexts as developing/emerging countries induces to use whatever may cut prices even if damaging the environment.

_ *policy implication/opportunities...*

This scenario has serious impacts for policy making on the European level and the need to implement entirely new measures and policies, which is difficult due to cultural and historical trajectories and inertia.

_ *dimensions of change…*




_ *critical/open questions…*

The following questions are significant for this scenario:

Will such products have also a potential in highly developed countries? What are the technological (life-cycle, scale economies, etc.) and organisational factors (firm culture) which allow adopting such a strategy? Will this have an effect on regulation and safety standard? What are the environmental impacts?

## 3.9 Bringing outside in

### Bringing outside in

Part 1_amplification script:

*_starting weak signal(s):*

Boom in Crowd Sourcing

Future Concept Lab

LEGO Digital Designer

Sample Lab / Tryvertising

Rapid Innovation Testing

*_summary text*

"More and more companies use different sources of outside knowledge for the creation of products and services, which are then finally realised and brought to the market by the manufacturer. Strategies such as rapid innovation testing, Crowdsourcing or sample testing are applied. This leads to an even more, open and networked economy and society, which enables a more efficient innovation process, less product failures and more satisfied customers."

**Bringing outside in...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

The use of external knowledge and creativity is a dominant trend for the last two decades. Methods and strategies such as the lead user method, user innovation toolkits, idea contests and focus group testing have become important strategies. This development becomes even more important due to the acceleration of product life cycles and the complexity of the innovation process. Therefore, any type of companies use different sources of outside knowledge for the creation of products and services which are then finally realised and brought to the market by the manufacturer.

_ *future resulting situation…*

Employees have always been the first gate for companies to access to networks: through personal relationships of the people. They access to additional connections and networks. With the increase of people connectivity for company purposes, personal and professional networks at all levels of hierarchy will blur, the “highly networked” company is likely to develop, facilitating the collaboration between entities and the merging of knowledge. Strategies such as rapid innovation testing, crowdsourcing, sample testing, etc. will become standard tools in the future in almost all industries for small as well as large firms.

_ *level of uncertainty…*

There are still barriers to exploit external innovation sources, e.g. accessed through employees, in many firms (traditional Not Invented Here (NIH) syndrome, intellectual property). However, there is increasing awareness that external sourcing of creativity input can bring big benefits for companies.

_ *potential impact (opportunities, threats...)*

We can think of the following impacts:

Open Innovation strategies lead to an even more open and networked economy and society with increasing number of SMEs open for interaction and co-operation; enabling a more efficient innovation process, less product failures and more satisfied customers. Participating actors use their experiences to benefit in other business relations, at the same time “working poor innovation communities” might emerge. This innovation strategy is also an attractive way for companies to externalise risks and costs.

The blur between personal and professional networks, activities, numeric tools - especially if encouraged by the companies themselves - is likely to increase the company as groups of personal entrepreneurs rather than a consolidated body.

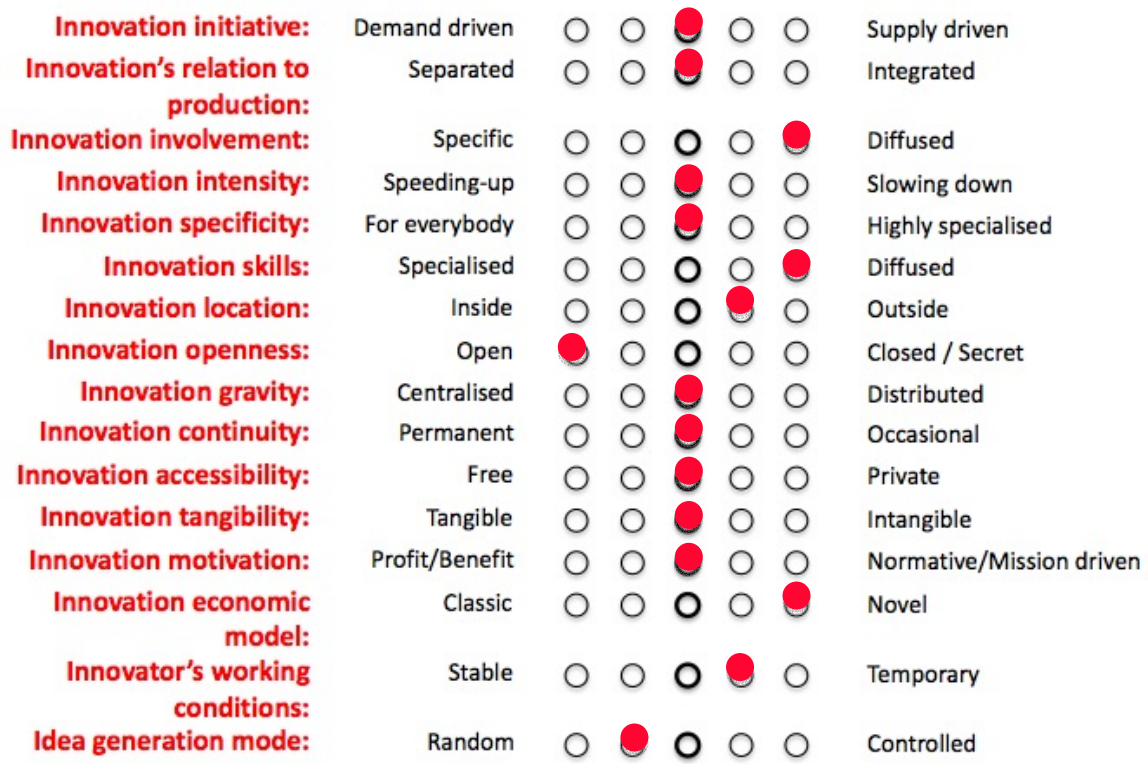
If the concept of 'open companies' is likely to facilitate cross fertilisation of knowledge with many external actors it may also 'dissolve' the notion of company as a clear and autonomous entity: the vision that seems to emerge is more the one of a system were 'companies/nodes' are less important than 'relationships' between those nodes.

_ *policy implication/opportunities...*

Policy can support the use of external ideas by many instruments and measures. Amongst others fostering co-operation, the requirement or possibilities to incorporate users, suppliers, etc. within R&D projects and programs would enable the development of this innovation pattern. Already in the past policies supporting this trend were launched which would have to be enforced within this scenario leading a pure `network innovation’ model.

_ *dimensions of change…*

The following dimensions of change are relevant:




_ *critical/open questions…*

The following questions might be of interest for further discussion:

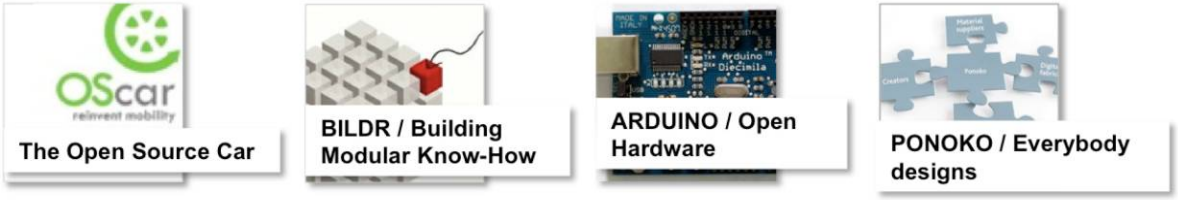
Does the gratification of ideas become a source of conflict? What are incentives for external actors and how can the process be organised? How to manage relationships on the long term, between companies and employees, between companies and external actors, between employees and external actors?

## 3.10 Open source society

**Open source society**

Part 1_amplification script:

*_starting weak signal(s):*




*_summary text*

"The idea of open source development is not limited to software development any longer but is an all compassing innovation pattern spread to other industries. The recent announcement to develop an open source car gives and indication for this development. This is on the one hand an attractive way for companies to externalise risks and costs, on the other hand communities provide the interested public with developments for common use. Finally, IPR could be disposed leading to an entirely new economic system."

**Open source society...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

Especially in the software development the sharing of knowledge and co-development within a community (e.g. LINUX) have become a boom. This model is transferred to other areas and industries. Many open source platforms in the internet or the recent announcement to develop an open source car can be mentioned.

_ *future resulting situation…*

The idea of open source development becomes a dominant innovation pattern in almost all industries. Participating actors use their experiences to benefit in other business relations while open source innovation is an attractive way for companies to externalise risks and costs complementary to other open innovation strategies (e.g. Crowdsourcing). This leads to a more efficiency of the development process but possible also to a large “working poor innovation community”.

However, at the same time new forms of rewarding are needed. Why not reward an innovation based on its value for society, environment or safety? The money could come from a global innovation fund. For poorer countries, the disestablishment of patent protection opens new opportunities to fight diseases and poverty.

_ *level of uncertainty…*

There are some uncertainties related to this development. Communities of experts or amateurs are collaborating either because the focused question is so difficult that a joint effort is requested (i.e. human genome) or because a huge effort of innovation is needed for deployment (i.e. iPhone apps). In both cases 'open source' is likely to develop maybe less in terms of 'complete openness' but of 'regulated open collaborations'. Moreover, generalisation of 'open source' means that the links/exchanges between the people working in the same area (i.e. automobile engineers, pharmaceutical chemists...) is stronger than the link/exchanges each of them have within the institution/company where they are employed, in other words, the benefits of sharing are higher than the risks/loss of sharing. Finally, the existence/emergence of common goals/challenges (i.e. global warming, ...) may favour the consolidation of such a 'meta level of innovation'.

At the same time, due to the power and lobby of big established firms and the need to protect investments this scenario is unlikely. Current development such as the iPhone or the iPad shows that highly closed or secret innovations are a counter trend showing an ambivalent development. Moreover, studies have shown that firms emplying open source strategies are nevertheless hold some part of the source code secretly.

_ *potential impact (opportunities, threats...)*

Possible impacts are:

The result of this regulation/IPR improvement to include/solve these 'regulated open collaborations' is likely to produce more interdependency between research and development communities on the global level.

Competition on the market could be slowly replaced by 'strategic co-opetition' between companies. The critical question of a balanced 'co-opetition' is to regulate that a certain level of competitiveness ensures constructive improvement between monopolistic inertia and market competition.

On the long term we may also see a stagnation of innovation activities within firms, everyone is waiting for the others to move, companies might go more towards closed innovation, so open source may turn into closed innovation.

From a social perspective, democratisation of product knowledge might give benefit to poorer societal groups and societies, increase of 'copy and past' might lead to less safe products and thus higher societal costs.

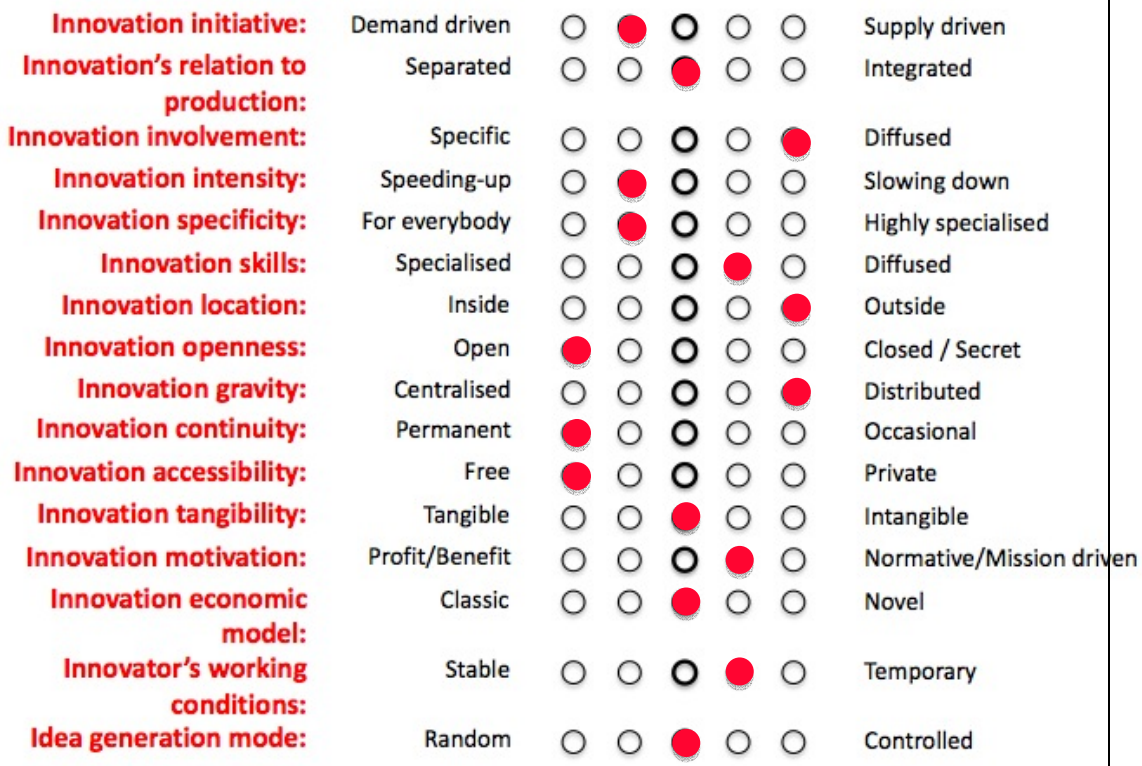
From a ecological perspective, more environmentally friendly technologies might be developed due to stronger motivation of user groups and loss of market power, change in food and agriculture industry.

_ *policy implication/opportunities...*

The question of IPR is a central issue in this context and requires policy actions. In addition, competition policy will have to cope with new challenges.

_ *dimensions of change…*

This amplified signal has many impacts on the "change dimensions":




_ *critical/open questions…*

Interesting questions for this vision are:

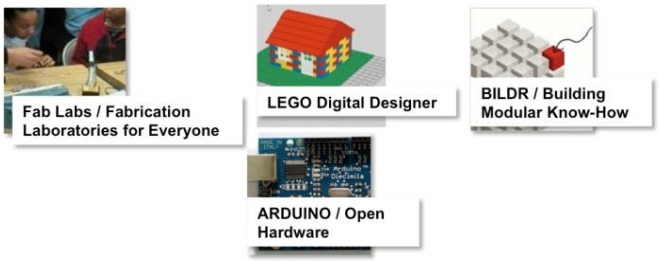
What are business models which allow to incorporate the innovations with the existing business? What about IPR? What are the incentives? How do standards emerge? Do what extent will dominant market players involve in such communities or undermine the principles of open source development, e.g. open source development of VW e-car. What are consequences for the individuals who contribute on the long term? What forms of regulations and co-ordination mechanisms are necessary and who provides them (e.g. pendants to Gnu which was created for SW development)?

## 3.11 Do-it-yourself

### Do-it-yourself

Part 1_amplification script:

*_starting weak signal(s):*




*_summary text:*

"Fab Labs (fabrication laboratories) are small-scale workshops with an array of computer controlled flexible manufacturing tools that cover several different scales and various materials. They have been developed by MIT center of bits and atoms with the aim of enabling people to make "almost anything". Fab Labs are installed around the world and becoming increasingly popular. What if self-production of personalised objects became the dominant mode of producing commodities?

Simple objects are produced directly at home through 3D printing or in "create it yourself shops/malls" with flexible manufacturing equipment and professional support on demand while companies just deliver materials, equipment and design tools. For more complex products, companies deliver components (beta objects) that consumers can choose in virtual marketplaces and then assemble and modify into any desirable object fast and easily. Fabbing has become an important part of identity formation. The role of brands is diminished."

Do it yourself...

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

Visions incorporating a more active role of the consumer have been around for a long time starting with the “Prosumer” of Alvin and Heidi Toffler in the 1980ies. However with the advent of technologies like rapid manufacturing and fab labs on the one hand and phenomena like user driven innovation, open source production, interactive production on the other, the idea has become appealing to wider audiences. Moreover, the approach can be linked to concepts of localised sustainable production/consumption patterns.

_*current state of development...*

Personalisation of products and services is widely recognized as a key challenge for manufacturing to accommodate increasingly diverse demands of consumers in global markets. Several companies already use the potential of the internet to involve users into the design of their own products. New technologies in the context of rapid and agile manufacturing diminish the cost of manufacturing in lot-size one. Fab labs and 3D rapid manufacturing technologies are becoming cheaper and more reliable. Research into adapting them to use outside of the factory is ongoing. Social media have spurred a general interest in creating personalised profiles. Some fab labs have been successfully installed all-over the world.

_ *future resulting situation...*

Simple objects are produced directly at home or in “create it yourself shops” with flexible manufacturing equipment and professional support on demand. In these cases companies just deliver materials, equipment and design tools and may generate revenue from mediating the exchange of designs. For more complex products, companies deliver components (beta objects) that consumers can choose in virtual marketplaces and then assemble and modify into any desirable object fast and easily. Self creation of products through fabbing has become an important part of identity formation. The role of brands is diminished.

The result would be a significant shift in the business models of manufacturing companies. At the same time social fabric would be changed with everyday creativity playing a much more important role.

_ *level of uncertainty…*

It is uncertain for which type of products self production is really feasible. The vision may be restricted to very personal objects like jewellery. Also it is unclear which kind of economic model will govern value creation in this kind of vision. If companies play a minor role, where do people earn money? The vision could be oriented in a more collective way e.g. platforms for exchange of designs, neighbourhood fabbing shops or else in a very individualistic manner with each household operating several fabbers.

_ *potential impact (opportunities, threats...)*

opportunities:

Quality of Life: Personalised products, widespread unlocking of creativity

Society: Enabling of local solutions, strenghtening of inclusion

Environment: Reduction of transport due to localisation

Threats:

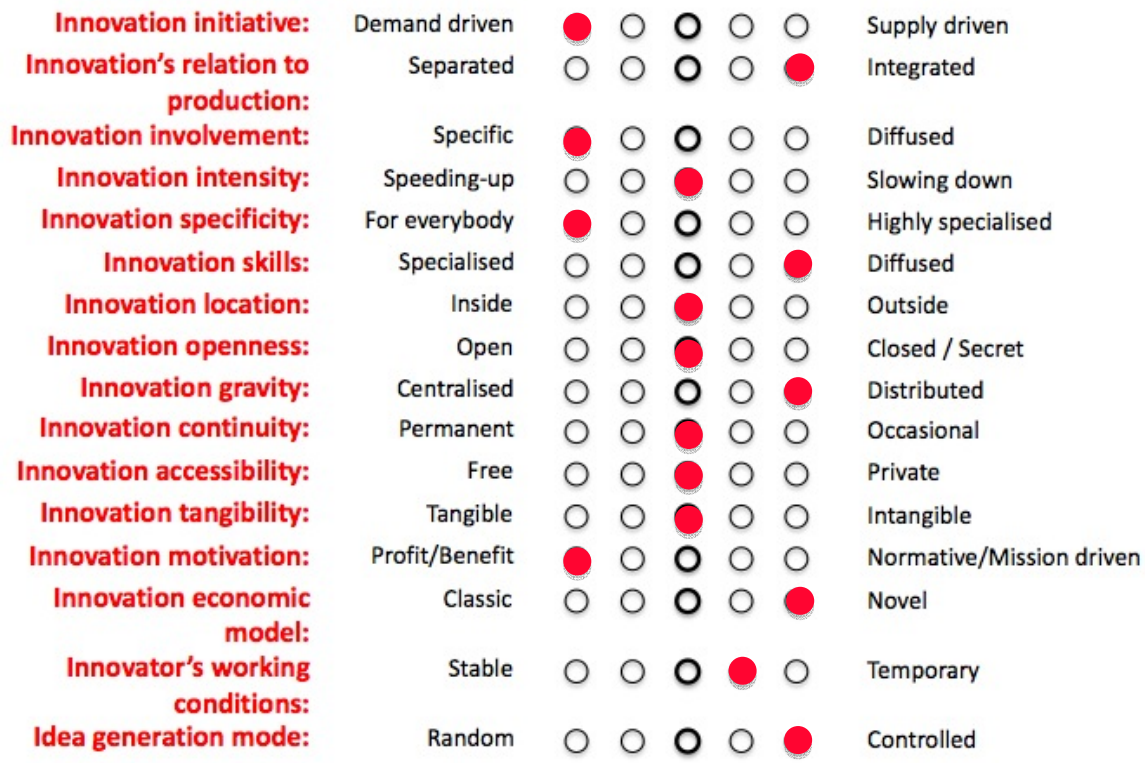
Economy: Economic crisis due to lack of adequate business models

Environment: Increase of waste, less reduced energy efficiency of production

_ *policy implication/opportunities...*

Need to explore sustainable fabbing pathways, need for experimenting to understand users' preferences. Support companies to prepare an develop adequate business models. What are the implications for skills and competences?

_ *dimensions of change…*



## 3.12 All innovative employees

### All innovative employees

Part 1_amplification script:

*_starting weak signal(s):*


*_summary text:*

"Tata Consultancy has implemented several strategies in order to build a culture of innovation and stimulate employees to think innovatively. These strategies involve e.g. creative thinking as one of nine performance categories on which employees are evaluated as well as making innovation an essential component of all trainee programs. Furthermore five hours of the 45-hour week can be used by employees for developing ideas on new concepts and product improvements. What if the current emphasis on innovation and creativity for designers, programmers and engineers would spread to all workplaces? All employees from the janitor to top management are constantly involved into innovation activities. Creativity is part of any jobs daily routine. Performance measurements are based on creativity, ideas and innovation initiatives. The innovation imperative is all pervasive throughout the company."

**All innovative employees...**

Part 2_discussion of the amplification:

_*current stage of development...*

Currently more and more companies focus on innovation as the key road to competitiveness. However, the responsibility for innovation is mainly placed with specific groups such as designers and engineers for product innovation and management for process innovation. At the same time, in the realm of quality assurance the approach of “total quality management” which advocates a fully distributed responsibility for quality assurance is becoming prominent. Unions have been advocating more innovation responsibility for all workplaces for quite some time.

_ *future resulting situation...*

Innovation has come to be seen as an organic distributed process involving contributions from all workplaces instead of being confined to certain professions like engineer, designer or artist. All employees from the janitor to top management are constantly involved into innovation with companies providing time, space and enabling infrastructure. Many companies have adopted the Tata/Google principle of assigning a certain time for free innovation. Incentives and creativity based performance indicators assure that everybody considers innovation as part of their business. Creativity is part of any jobs daily routine. Innovation is considered as a permanent state of mind rather than as a particular activity, the innovator’s figure has become diluted.

_ *level of uncertainty…*

It is highly uncertain whether many companies will follow that route. Substantial resources are required without immediate pay-off. Current innovators will probably defend their privileged situation. Already now designers are critical towards user innovation.

_ *potential impact (opportunities, threats...)*

Threats:

More and more people may suffer from the constant innovation pressure, innovation could come to be regarded as something undesirable and negative. Increasingly, people may feel compelled to use their spare time to meet the innovation demands with threats for health. Creativity drugs could become common. There may be a loss of orientation due to the continuous change. Designers and engineers may feel threatened by the distributed innovation approach.

Companies may spend a lot of money without adequate pay-off

Opportunities:

More rewarding jobs due to space for creativity for everybody.

Better quality of innovation due to wider range of inputs.

Higher agility of companies due to more diverse range of perspectives influencing innovation.

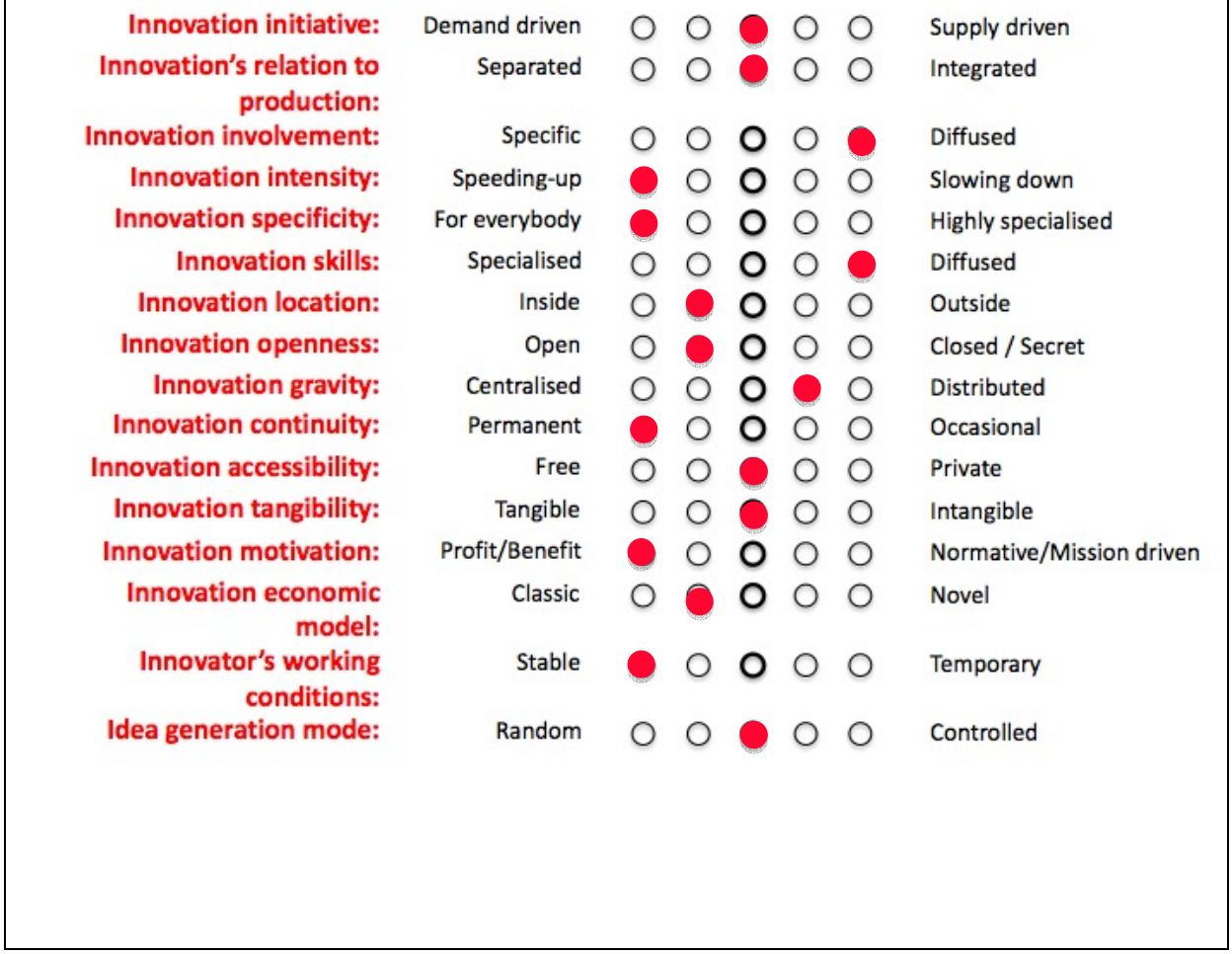
Challenges:

Total innovation management: How to channel the distributed innovation process? how to decide which ideas to follow up?

Sustainable distributed innovation: How to avoid the innovation momentum turning into an innovation imperative/pressure?

Education: What are the implications for skills and competencies? How can innovation skills be developed?

_ *dimensions of change…*



## 3.13 Innovation marketplace

### Innovation marketplace

Part 1_amplification script:

*_starting weak signal(s):*

CoWorking houses as creative hubs

Edison / Match-Making for Innovators and Companies

Career and Community Site for Creative Professionals


High Prized Open Innovation Competition

Boom in Crowd Sourcing

*_summary text*:

"Companies increasingly outsource innovation tasks in the form of open competitions. The American online video rental shop Netflix has offered 1,000,000 US-dollar for the team who is able to improve their movie recommendations by at least 10 percent. Crowdsourcing marketplaces such as InnoCentive, TopCoder, uTest, and CrowdSpring are booming. At the same time co-working spaces for creative workers are becoming popular around the world.

What if this type of "market-mediated" innovation model became widespread?

Innovation is no longer tied to a company but outsourced to competing innovators via idea contests, tenders and competitions. Nomadic innovators work in co-working spaces, which have become top-favourite employers for creative people."

Innovation marketplace...

Part 2_discussion of the amplification:

_*current stage of development...*

Companies increasingly outsource innovation tasks in the form of open competitions. Crowdsourcing marketplaces such as InnoCentive, TopCoder, uTest, and CrowdSpring are booming. There is some attention towards crowdsourcing in academic debate (cf. INFU deliverable 1.1) Co-working spaces for creative workers are becoming popular around the world.

_ *future resulting situation...*

The innovation marketplace has become the dominant model of innovation management. Co-working spaces have become the most popular form of working for creative people.

_ *level of uncertainty…*

It is uncertain for which kind of innovation tasks can sensibly be outsourced and which ones require the company environment and a firm grounding in the company's culture.

_ *potential impact (opportunities, threats...)*

Opportunities:

Companies may be able to draw on a much broader range of ideas and perspectives. They can manage their innovation processes more flexibly and efficiently.
Co-working spaces provide a good alternative to nomadic isolated worklifes of self-employed knowledge workers. They may also become seeds of social entrepreneurship and help inclusion of marginalised groups.

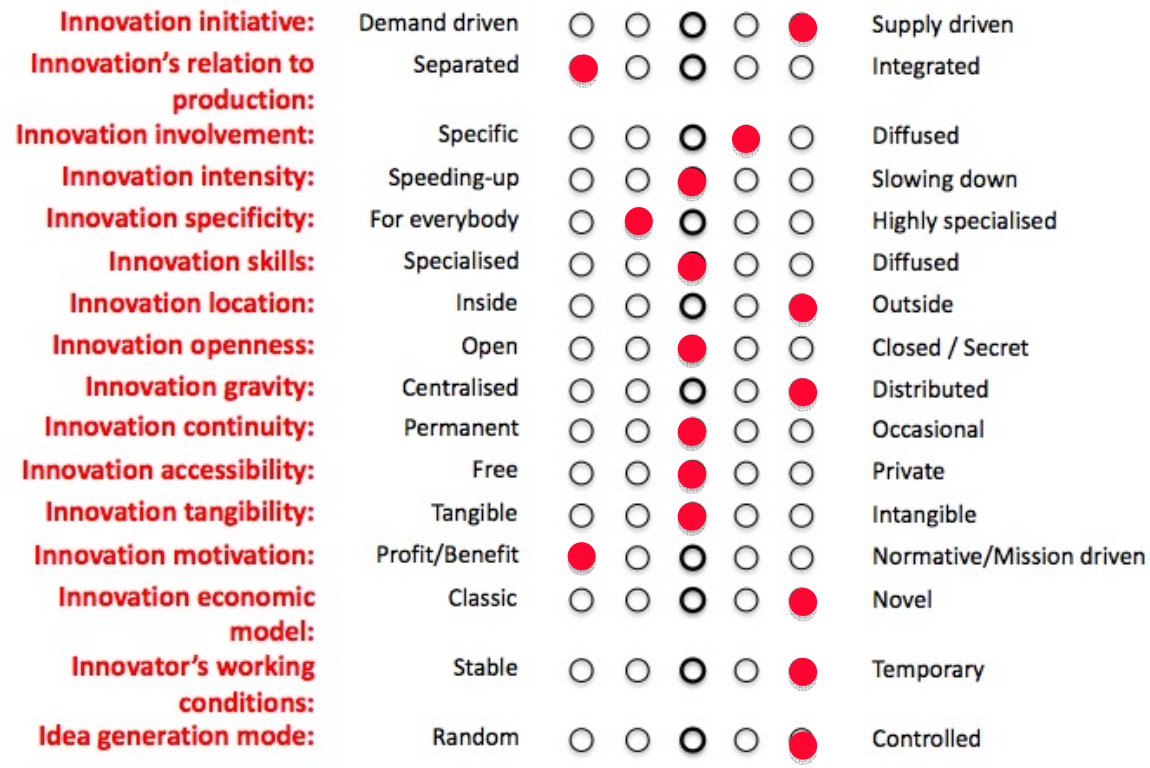
Threats:

Is the nomadic innovator's life sustainable? What will become of the creative talents once they have other societal engagements or getting older and less dynamic? How will the social fabric change if everybody competes with everybody?

_ *policy implication/opportunities...*

Explore sustainable formats of innovation marketplace. Systematically collect experiences with crowdsourcing and co-working spaces. Foster experimentation.

_ *dimensions of change…*



## 3.14 Evolutionary simulation of innovation

### Evolutionary simulation of innovation

Part 1_amplification script:

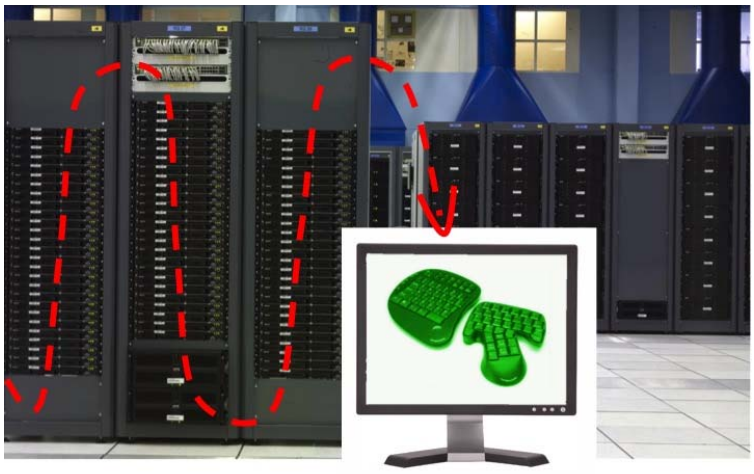
*_starting weak signal(s):*


*_summary text*:

"Digitalisation makes innovation processes cheaper and more efficient, as they enable easy testing and evaluation – offline and online. Enterprises increasingly use digital systems to test an ever-growing number of their ideas and thereby increase the probability of finding good solutions and decrease the probability of disinvestments.

What would happen if the new testing possibilities were combined with the rapidly growing information on consumer behaviour and the common innovation process of nature?

An enormous number of virtual product variations could be generated randomly and tested thereafter. Based on extensive data on consumer behaviour the life cycle could be simulated and product variations with favorable market perspectives could be selected for further optimisation. The determining factor would no longer be the creativity of people but instead the availability of virtual life cycle testing possibilities."



**Evolutionary simulation of innovation...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

In the MIT Sloan Management Review, Erik Brynjolfsson and Michael Schrage discuss what faster innovation means for corporate America:

"Technology is transforming innovation at its core, allowing companies to test new ideas at speeds—and prices—that were unimaginable even a decade ago. They can stick features on Web sites and tell within hours how customers respond. They can see results from in-store promotions, or efforts to boost process productivity, almost as quickly."

_*current stage of development...*

"Innovation initiatives that used to take months and megabucks to coordinate and launch can often be started in seconds for cents.

And that makes innovation, the lifeblood of growth, more efficient and cheaper. Companies are able to get a much better idea of how their customers behave and what they want. This gives new offerings and marketing efforts a better shot at success."

Already today digital companies like Amazon and Google use IT-based experimentation regularly. They deliver different version of the same "product" (Google up the 300 per day) at the same time to different visitors, monitoring customers experience and following –through. Today digital products are still tested with real customers. The information on customer behaviour is not yet used for simulating product performance but only used for monitoring experiment results.

_ *future resulting situation...*

More rapid innovation leads to more rapid evolution. Companies will be willing to try new things, because the price of failure is so much lower. If this new innovation pattern is radicalized it leads to virtual product variations that are randomly produced and virtually tested. Only the "fittest products survive" with high market potential and favorable life cycle predictions.

_ *level of uncertainty…*

It still remains uncertain, if it will be possible to simulate customer behaviour and therefore product life cycles adequately. Without these simulation possibilities the number of product variations will be limited and therefore the random approach might not be successful.

If the protection of consumer data increases / the enomous amount of data is hard to handle, analyse & control, therefore it might be questionable if it would be of any advantage for innovators.

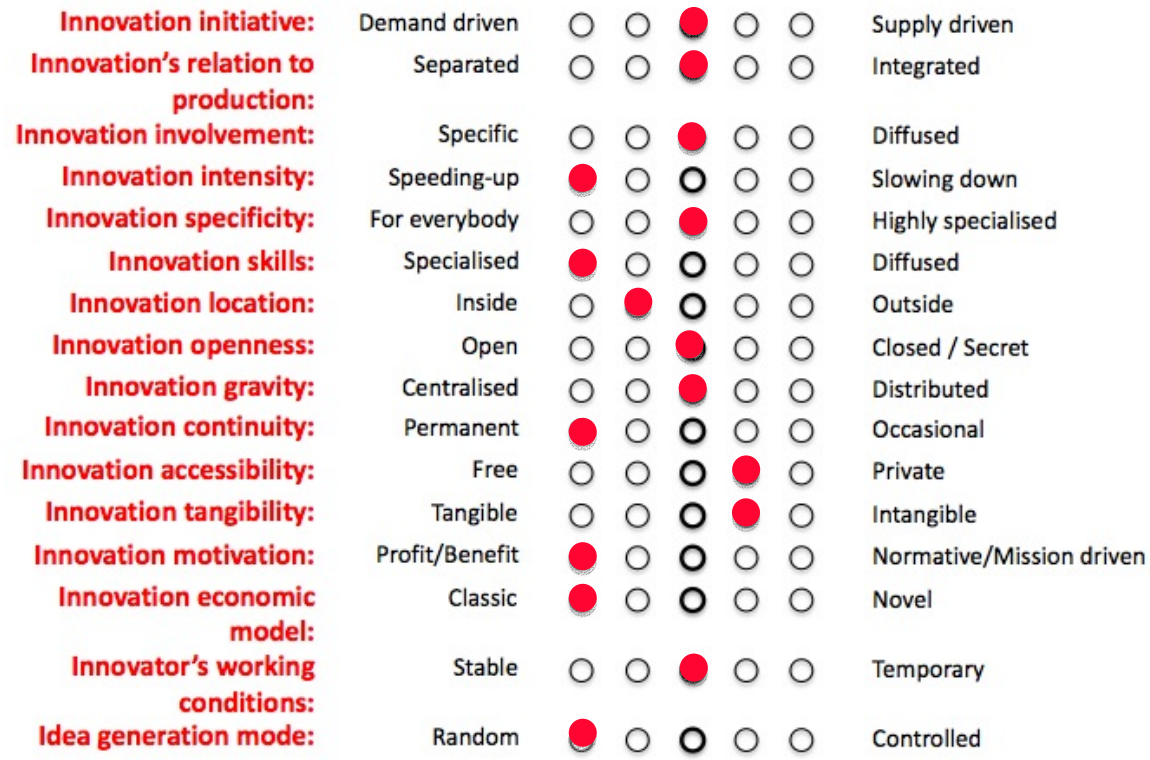
_ *potential impact (opportunities, threats...)*

Automated creativity and creative coincidence would revolutionises the product design process. Designers' role could become more administrative and less creative. The handling and analysing of data would become the crucial skill for innovation management.

_ *policy implication/opportunities...*

Innovation cycles could speed up tremendously leading to problems with standardization and data confidentiality. On the other hand these simulation tools could also be used to estimate and optimize the environmental impact of products beforehand.

_ *dimensions of change…*

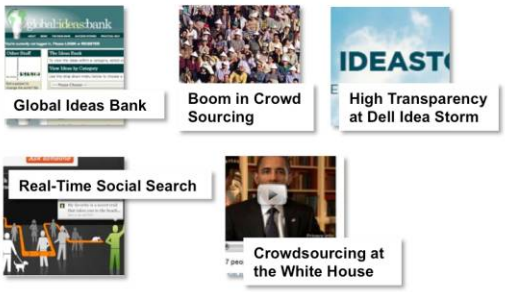


## 3.15 Internet scanning for innovation

### Internet scanning for innovation

Part 1_amplification script:

*_starting weak signal(s):*




*_summary text:*

"Today data on the behaviour of people is already constantly collected and used for individual marketing based on user behaviour. What starts with Web 2.0. features on the internet could lead to a society where customers become completely transparent. At the same time more and more companies look into diverse databases and use crowd sourcing to foster their innovation, to get inspiration and to benchmark creative dynamic in their sectors.

What would happen if it became possible to scan the internet for ideas and to filter those ideas according to current customer needs automatically?

Sophisticated filters would automatically extract ideas with outstanding market potential. Changes in the behaviour or the use of a product would be detected without delay and the most appropriate ideas for product optimatisation would be available immediately. The innovation would then be triggered by changes in the behaviour of people and there would be no time lag, thanks to real time investigation."

**Internet scanning for innovation...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

Street fashion blogs, for example, are highly valuated as inspirational or trendsetting by the fashion community. Crowdsourcing marketplaces such as InnoCentive, TopCoder, uTest, and CrowdSpring are booming. Another example: The Happiness Program led Future Concept Lab, was a research program that provided a cross-cultural insight on teenagers and elderly's day-to-day experience of Happiness. It focuses on the material forms, images and places that young adults (14-22) and mature adults (55-70) recognise as meaningful and joyful in their day-to-day experience. Respondents have been asked to fill in a photo diary for a period of seven days and taking photos to the 'objects of their Happiness', people, places, products, etc.

_*current stage of development...*

People voluntarily and accessible to almost everybody, post ever more details about their beliefs, desires and preferences on the internet. This data allows companies to adopt products and marketing accordingly. In the future with ubiquitous computing more and more products could be equipped with nano-size computers and sensors.

While for some experiments customers have to be actively participating, such as the "Happiness Program" (see Future Concept Lab weak signal) or other "LivingLab" experiments other data on customer behaviour is gathered without active participation. IT based companies are extensively using continuous improvement and experimentation for marketing purposes.

The idea collection on the internet is today also mainly based on explicit participation (e.g. Global Ideas Bank) but at the same time the scanning of blogs or chats doesn't require the explicit formulation of ideas.

Today the filtering of the information is still not done automatically and consumer data and ideas are not automatically liked to each other.

_ *future resulting situation...*

Sophisticated filters would automatically extract ideas with outstanding market potential. Changes in the behaviour or the use of a product would be detected without delay and the most appropriate ideas for product optimisation would be available immediately. The innovation would then be triggered by changes in the behaviour of people and there would be no time lag, thanks to real time investigation. The innovations pattern would dramatically change.

_ *level of uncertainty…*

Filtering will be the crucial point, because of information overload. Enormous limitation for personal privacy could lead to the rejection of ubiquitous computing.

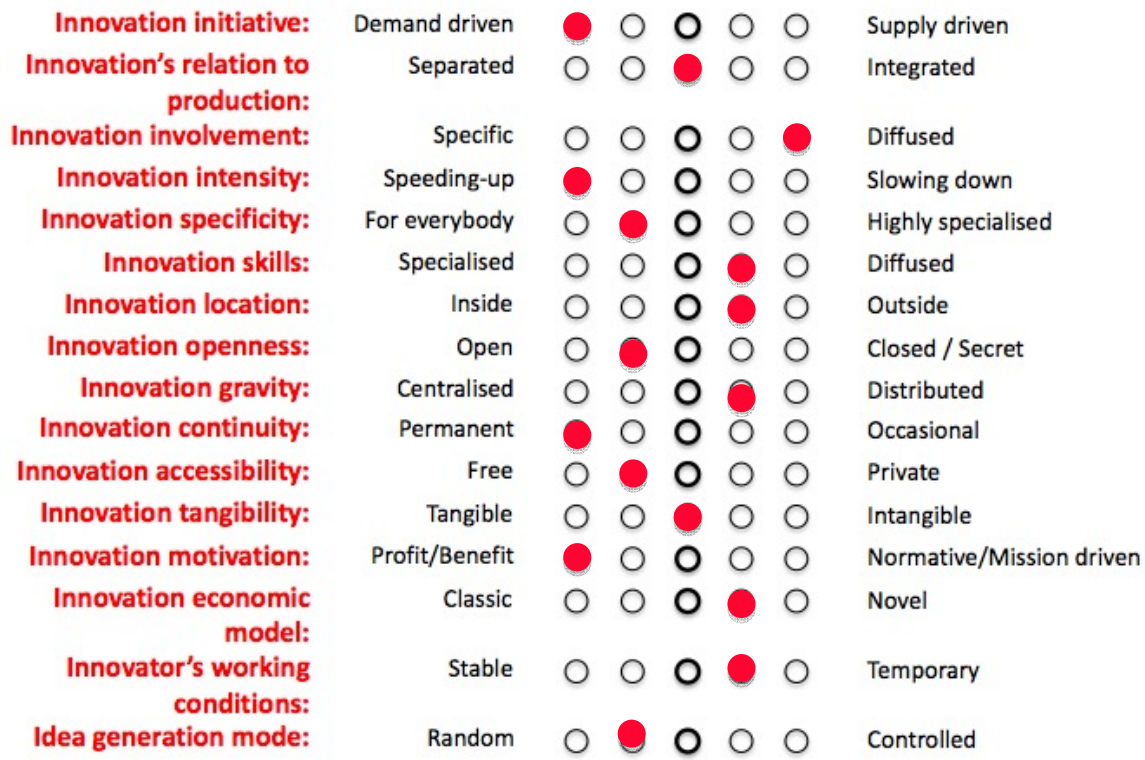
_ *potential impact (opportunities, threats...)*

Crowd sourcing offers the possibilities to find a great number of people worldwide who are interested in the same things, this should have an enormous impact on the idea generation. Efficiency of innovation processes might be increased if the filtering of the results of extensive experiments will be available immediately all over the world. Some types of market research would no longer be necessary, e.g. the lead-user approach would belong to the past, meaning that taste, fashion and customer demands would no longer be predetermined by a small group of users.

_ *policy implication/opportunities...*

Intellectual property rights could become an obstacle on this way. Data protection becomes more important as “hacking” becomes more interesting; hackers are hired and paid for highly private data (a signal in this direction: data on bank accounts in Switzerland).

_ *dimensions of change…*



## 3.16 Innovation culture starts at kindergarten

### Innovation culture starts at kindergarten

Part 1_amplification script:

*_starting weak signal(s):*

Innovation Initiative in Schools/d-school-blog.de

Google

Google / Institutionalising the Free Creativity

Design Thinking in MBA Programs

*_summary text*

"The integration of education and innovation systems is already on the agenda of national and EU considerations and efforts.

What if efforts to integrate innovation culture and education would start in primary school?

Children would be taught innovation skills as a matter of course, just like the ABC."

**Innovation culture starts at kindergarten...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

A growing number of companies put a high emphasis on fostering innovation culture by encouraging their employees to develop own ideas (e.g. Google / institutionalising of free creativity; Innovation culture at Tata). A new generation of innovation professionals is emerging from interdisciplinary master's programs, which integrate design, technology and business and want to combine innovative and analytical thinking …

_*current stage of development...*

… It therefore seems reasonable, to also encourage innovative thinking in schools. The integration of education and innovation systems is already on the agenda of national and EU considerations and efforts. National programms are evolving (e.g. Generation Innovation in AT), which foster innovation culture from early on.

_ *future resulting situation...*

Children in schools will be rewarded and motivated to maintain their "discovery spirits" and will learn how to question facts and think things differently. Learning will be project oriented, e.g. kids built their own schools, and innovation becomes something that is taught as a matter of course, just like the ABC.

_ *level of uncertainty…*

The education system in several European national states is still quite inflexible. A change in the mindset/training of teachers and a change in the structure of responsibilities and competences is a precondition to overcome oldfashioned "innovation hostile" teaching. To overcome existing barriers might be very time and cost intense.

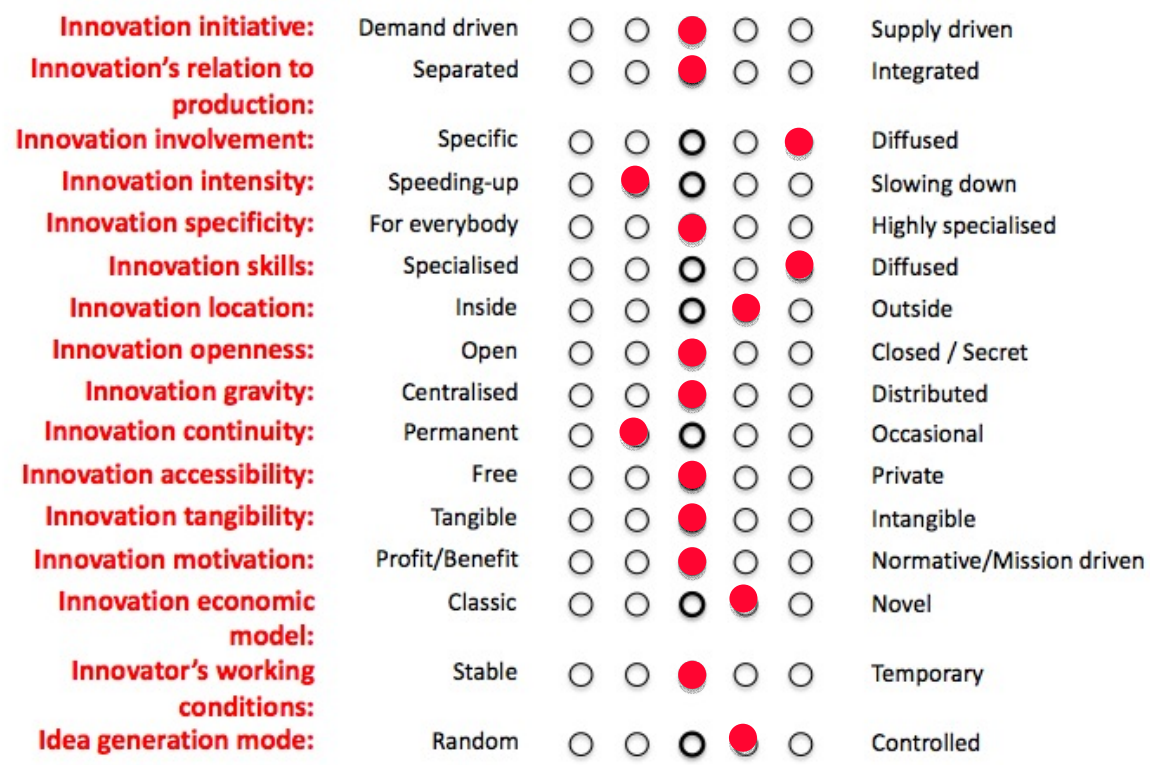
*potential impact (opportunities, threats...)*

The described development would lead to a better access to qualified and creative workforce and thus be a locational advantages not only for companies but for Europe as a whole.

However, pressure to be innovative / to catch up with innovation culture could increase. What would happen to the non-innovative?

If sustainable thinking and problem solving would be a part of the innovation culture it could lead to better solutions for ecological problems.

_ *dimensions of change…*



## 3.17 Regional shift in innovation gravity

### Regional shift in innovation gravity

Part 1_amplification script:

*_starting weak signal(s):*





*_summary text*

"In 2008 the headline of businessweek.com was "India´s Tata leads Car Innovation" and the European automotive industry was shocked when TATA Motors delivered on their promise to launch a car for the price of 2000 Euro.

What if more and more successful and disruptive innovations were to come from emerging markets?

Western countries could fall behind in the race for innovation and it would become common that successful new products come from countries, where economic growth meets large populations with a hunger for change."

**Regional shift of innovation gravity...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

Multiple developments indicate that, the number of innovations that “trickle up” from emerging to developed worlds will further increase: First of all, developing countries concertedly spend huge amounts of money on R&D, especially on those fields with a high future relevance, such as nanotechnology, clean tech or biological applications, and make corporate innovation culture a top priority. Furthermore, globalization, the worldwide availability of information, as well as the enormous hunger for new ideas could drive a shift in innovation gravity. Additionally, many industrialized countries have to deal with structural social and economic problems …

_*current stage of development...*

Europe, the US and Japan, still have advantages in many innovation areas compared to the rest of the world, e.g. on average, companies from the Triad spend more on R&D and the population is better educated. Nonetheless Europe’s R&D spendings have been stagnating at around 1.85% of the GDP since 2004, while those of China and India grow continuously. Until 2020, China aims to reach a share of 2.5%. Beside that, campaigns for better public education have lead to the foundation of over 4,000 educational institutions on a top-level. And already today far more engineers graduate in developing than in industrialised countries.

_ *future resulting situation...*

The number of remarkable innovations that will be developed in the West will be in sharp decline, while the world will look excitingly towards the new innovation hubs in Asia and the Middle East. The West will lose its technological lead in many areas or will never succeed in gaining remarkable shares in future technologies. The worlds best educated will turn their backs on the Triad and enjoy optimal innovation conditions in those countries, where stable economic growth meets large populations with a large hunger for change.

Often, it takes some time until new products are available in Europe or are compatible with European plug-ins. The main target market is the bottom of the economic pyramid.

Companies from the East have to deal with a growing number of industrial espionage attempts from Western countries.

_ *level of uncertainty…*

The growing global innovation competition could also lead to a more balanced situation in which countries or world regions have specialised on specific innovation areas according to their specific conditions. R&D budgets could be bundled in order to create the world’s leading innovation hub in at least one certain area. If that would be the case, the innovation gravity would not shift from West to East, but rather be distributed all over the world.

But, however, the technological advantages of industrialised countries might be too hard to catch-up any time soon.

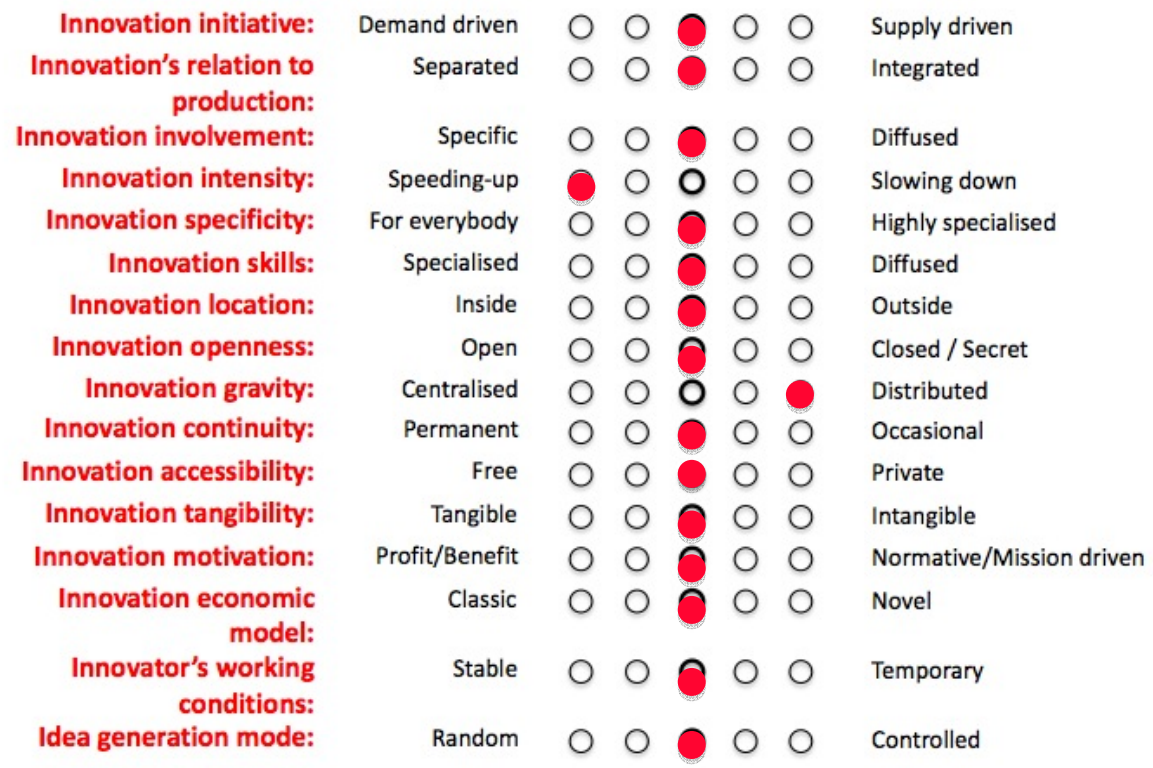
_ *potential impact (opportunities, threats...)*

Economy: Western companies would loose market shares and significance in international markets. Need for restructuring of Western markets: economies focus on local needs and local products with a high quality standard and no longer on front running products. The current tendencies: “globalisation of wisdom”, and “technological convergence” would be limited by specialised regional innovation clusters.

Social: Western Nations would loose wealth, while people in the Middle East / Asia profit. Social welfare systems in the West would no longer be fundable due to tax losses and a rise of “unproductive” shares of people in society (ageing and unemployment). The migration of highly educated people as well as industrial workers to new markets would increase. European societies would age even more rapidly than projected. Social tensions and crime could increase, as the West suffers economically.

Ecology: There is no money and acceptance left in Europe and USA to consider ecological needs.

_ *dimensions of change…*



## 3.18 Waste-based innovation

### Waste-based innovation

Part 1_amplification script:

*_starting weak signal(s):*


*_summary text*:

"The industry, the politicians and the general public of Venlo have agreed to adopted the principle of "Waste equals Food" and are now jointly working towards the implementation of their vision of a truly sustainable economy.

What if lifecycle thinking in economy would become common?

Material and production process databases, which offer only 100% reusable materials, would then serve as a starting point for innovations."

**Waste based innovation...**

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

The Dutch city of Venlo chose McDonogh and Braungart's concept of Cradle to Cradle (waste=food) as a vision for their city.

_*current stage of development...*

In 2008/2009 an exhibition in Maastricht presented the first Cradle to Cradle (C2C) products developed by companies in the region of Limburg (where Venlo is situated). The next important future milestone will be the Floriade - the World Horticulture Fair - in 2012 held every 10 years. The Floriade organisers have also decided to adapt Cradle to Cradle as their main theme, building a 66-hectare sustainable fair ground, which afterwards will be used to build Greenpark Venlo, a planned green business area.

_ *future resulting situation...*

Driven by a rising demand for sustainable products and increasing costs of raw materials more and more companies will try to work with recycled materials. Databases, giving an overview on all available 100% reusable materials, will become a key source for innovation inspiration and a method for the identification of the optimal reuse of dumped products. As a result the consumption of natural resources as well as the production of waste will decrease strongly.

_ *level of uncertainty…*

Although it is quite likely that costs for raw materials will rise at some point, the specific time is not expectable. This development could speed up when emerging nations like China buy up certain raw materials. However, rethinking economy, in this case, requires quite a fundamental mental, technological and organisational change.

_ *potential impact (opportunities, threats...)*

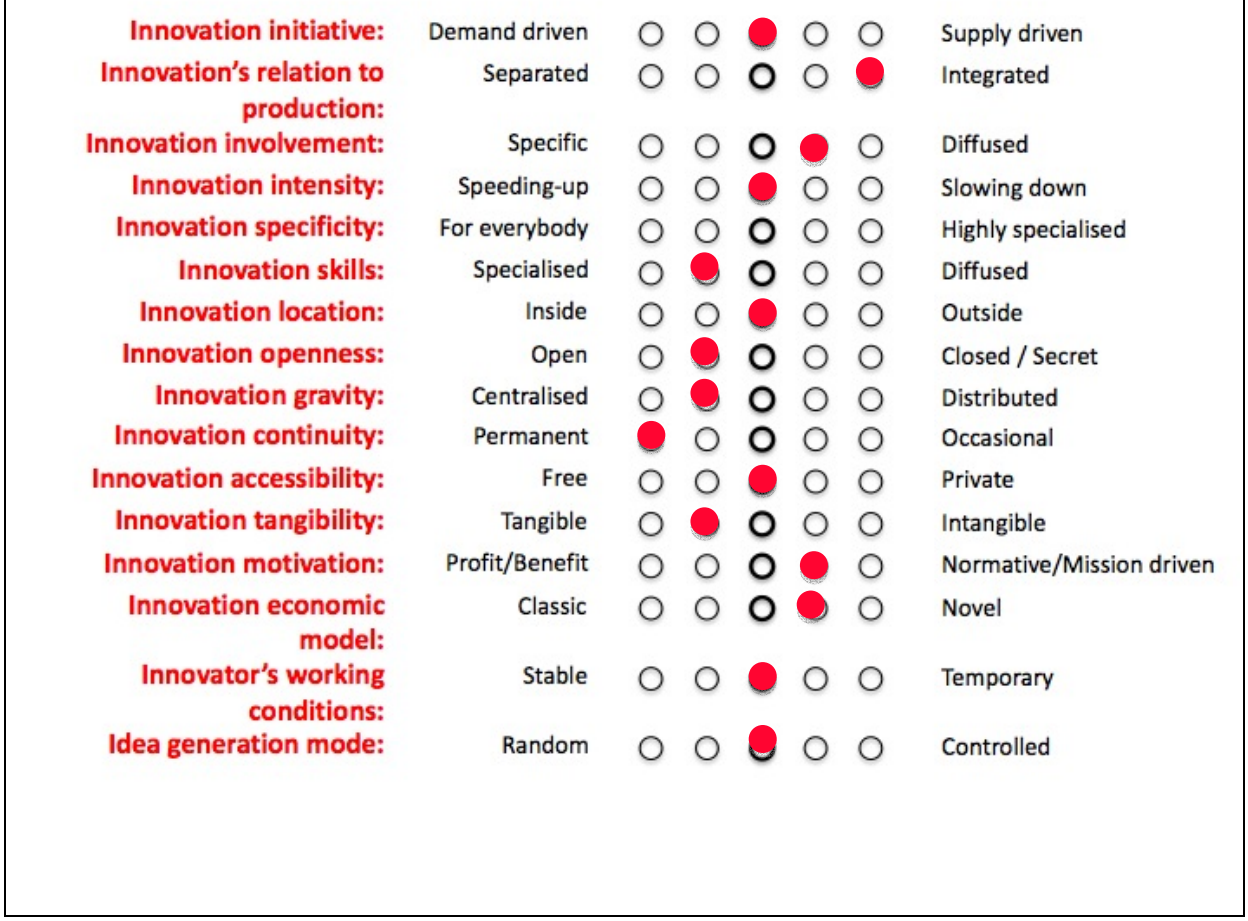
A change towards waste-based innovation would lead to a highly environmental-friendly economy. However, it depends on the specific product, if recycling makes sense, as in some cases recycling or reuse may have higher environmental costs. Some products might have to be banned entirely.

Waste-based innovation would probably lead to a radicalisation of material awareness and could open the door for the advancement of recycling technologies and production.

Trading of waste would become a highly profitable business. The environmental benefits are large.

A radical structural change could create high unemployment in the short run.

_ *dimensions of change…*



## 3.19 Laboratory department stores

### Laboratory department stores

Part 1_amplification script:

*_starting weak signal(s):*

Sample Lab / Tryvertising

*_summary text*

"Sample Lab! located in the shopping area of Tokyo, is a store where customers can try out the latest – often unreleased – products in return for leaving their feedback on the tested product.

What if stores were to become locations where companies and customers co-develop innovations?

Laboratory Department Stores would offer theme worlds such as "Family Life" or "New Sports", where customers can experience unreleased products, individualize existing goods and in return receive their personally desired item for consumption."

Laboratory department stores ...

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

Sample Lab! located in the shopping area of Tokyo, is a store where customers can try out the latest – often unreleased – products in return for leaving their feedback on the tested product. In return, they have to complete surveys that help brands, designers and manufacturers to improve and fine-tune their products for the mass market. It is a retail experience that promotes the testing products and innovations.

Other companies are searching for possibilities to integrate consumers into their production process, such as, e.g. Lego Digital Designer, a software created to let users compose their own masterpieces with Lego bricks and elements.

_*current stage of development...*

A growing number of companies in end-consumer markets are experimenting with ways to integrate consumers into their production and innovation process. At the same time more and more department stores are closing down, as consumer spending remains slack.

_ *future resulting situation...*

All big cities in Europe will have laboratory department stores at the heart of their shopping high streets. The traditional department stores will turn into huge shopping & experimentation malls one by one. Customers will come to laboratory stores not only to buy, but also to be part of the development and construction process of their favourite products. The stores will be tangible interfaces between consumers and companies, which will also be their main added-value compared to online shopping websites. The whole shopping process will be open to the consumer as he or she can try out prototypes in shopping theme worlds such as “Family Life” or “New Sports” and afterwards give recommendations or request new features talking to the engineers, designers and innovators on site. Moreover, consumers will be able to discuss own product ideas in special innovation consulting areas, while more and more companies will offer individually designed products as a special service.

_ *level of uncertainty…*

The concept of a laboratory warehouse requires a great degree of openness from companies towards their consumers, this might turn out to be a hindering factor. The consumer, however, will only adapt to the concept if it is a truly fun and inspiring experience and offers a real benefit.

_ *potential impact (opportunities, threats...)*

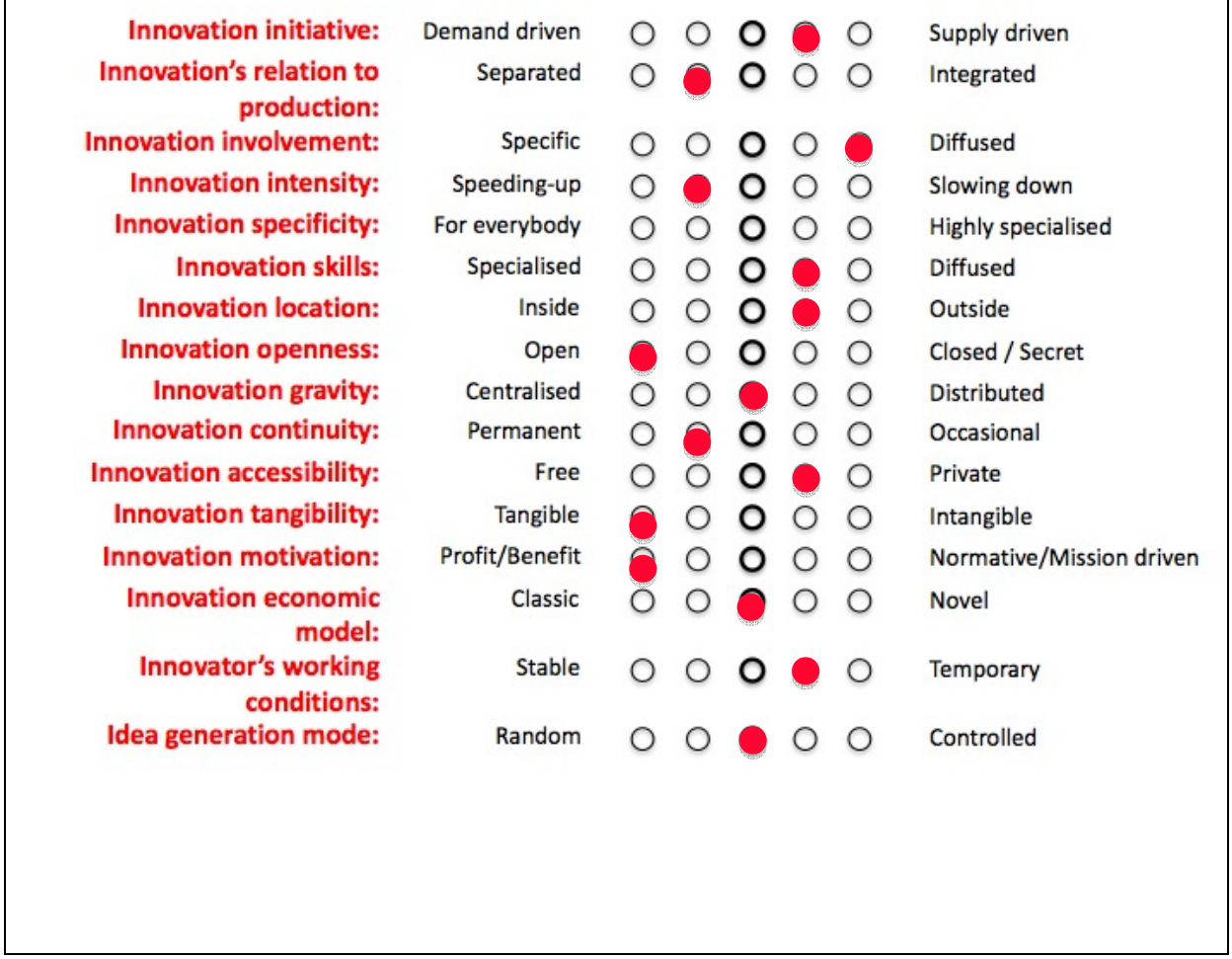
Social: This development could lead to an enlivening of city centres.

Economic: Revival of the department store and a boost of user innovation for the consumer industry.

Presenting products that are not ready for the market increases the risk of product piracy.

A “trying on the spot” cannot replace an in-depth trial in the long run: the information collected would be rather a spontaneous assessment than an evaluation of the usability of the product.

_ *dimensions of change…*



## 3.20 City-driven innovation

### City-driven innovation

Part 1_amplification script:

*_starting weak signal(s):*

Save our Energy

C40 CITIES The Climate Leadership Group

*_summary text*:

"In 2009 the city of Munich launched an idea contest to animate as many people as possible to generate and advance innovation concepts on energy efficiency in the fields of mobility and habitation.

What if cities became stronger actors in the field of innovation by proactively pushing for needed solutions?

Cities could take on the investment risks for the development and implementation of needed innovations and use this as a new economic factor by patenting and marketing their solutions to other cities."

Part 2_discussion of the amplification:

_ *origin and reference of the amplification...*

Some cities are already pro-actively engaged in the design and realisation of innovation processes (e.g. Idea Contest for “The energy efficient city 2020” in Munich). They launch and fund idea contests to find concrete solutions for their specific needs.

_*current stage of development...*

Cities have to deal with highly complex and multidimensional social, environmental and economical problems. Climate change, resources scarcity and demographic change are enhancing those challenges. Cities also play an important role in fighting global warming, as they are responsible for a large share of global $CO_2$ emissions.

It is observable that cities often go beyond national regulations and act faster than international politics. Many cities have committed themselves to reduce $CO_2$ emissions and waste by far more than prescribed by national laws, or even without concrete guidelines. Cities already feel the negative impacts of climate change and economic downturn and can not wait until the current political paralysis after the failure of Copenhagen has resolved.

In many cases there is no real motivation for actors from the private sector to think of solutions for those types of problems, as companies do not see a business case. Additionally, private actors are not always able to understand the specific needs of a city, which looks at things from a more holistic perspective. This calls for the involvement of many different stakeholder groups.

_ *future resulting situation...*

Cities will take things into their own hands. The public sector will become a strong driver of innovations. City-driven innovation will become the most recognised and one of the most successful innovation concepts.

With the help of idea contests, public tenders, crowdsourcing and other innovation concepts, cities will be able to address many of their most urgent problems. Democratised and participatory innovation models will help to develop new technologies and solutions, which are more sustainable and are associated with a behavioural change (i.e. energy consumption patterns). Most ideas will increase public welfare and conditions of living. Ideas will either be shared freely or sold to other cities or companies.

Companies will more and more realize the benefit of participating in public innovation contests.

_ *level of uncertainty…*

In light of empty city treasuries, it is doubtful, if cities can initiate and run huge innovation processes and campaigns. Cities would have to, at least in the beginning, rely on private innovation process expertise (costly).

Inner-political power struggles might make a city organised innovation process slow and inflexible. It might be misused for party-specific reasons.

_ *potential impact (opportunities, threats...)*

City-driven innovation initiatives could increase the probability that people find solutions for social and environmental problems, which are beneficial for all. They could also lead to ideas, which otherwise would have never been realised by private actors.

If cities are able to sell their ideas, concepts and solutions to other cities, this could mean a new “business field” for cities and bring extra money to their treasury.

_ *dimensions of change…*