



European
Research Area

EUROPEAN POLICY BRIEF



**Innovation futures in Europe:
A foresight exercise on emerging patterns of
innovation. Visions, scenarios and implica-
tions for policy and practice**

Ongoing project, First Policy Brief, December 2009

SUMMARY

Objectives of the research

The **INFU** project deals with the emergence of new innovation patterns such as open innovation, user innovation, community innovation, and design innovation. Based on a foresight exercise, the project examines the implications for business and policy making.

Scientific approach / methodology

The project employs various methods such as scanning weak signals, organising expert panels and workshops, developing scenarios and visualisation in order to develop plausible, long-term scenarios of future innovation landscapes.

New knowledge and/or European added value

For the first time, a foresight project is conducted to analyse and discuss the emergence and diffusion of new innovation patterns in order to orient long-term strategy building for policy and other innovation actors. The project combines different foresight methods in a unique way and studies the socio-economic context in order to assess different scenarios.

Key messages for policy-makers, businesses, trade unions and civil society actors

The emergence of new innovation patterns with new actors, different roles and new modes of interaction implies re-configurations in European innovation systems with diverse implications for European economy, society, and policy. Amongst others, new forms of innovations have implications for intellectual property rights, funding, business strategy and the environment.

Objectives of the research

There are a number of indications that the way economic actors interact in order to transform knowledge into new products and services is currently undergoing substantial change. While a few radical visions have picked up these signals and are predicting disruptive change for the economy and society, there has been little systematic exploration of possible future innovation landscapes and their implications. A more solid understanding of possible innovation futures and their implications for society is needed for research and other policies to be prepared for and to be able to benefit from the potential challenges arising from these changes. At the same time, there is a need for a debate among innovation actors from various perspectives to create awareness, shared visions and the momentum for change. In order to address these needs, the INFU project pursues the following objectives:

- scanning of weak signals for changing innovation patterns with a potentially disruptive impact for European S&T in the long run,
- systematic exploration of relevant and plausible future innovation landscapes through participative scenario building,
- assessment of scenario implications for the content of academic and industrial research, and key policy goals such as sustainability,
- deriving strategic options and guidelines for European research policy and relevant multipliers,
- initiation of an interdisciplinary, boundary-spanning stakeholder and expert debate on new innovation patterns.

Scientific approach / methodology

The project combines various foresight methods and builds on the existing academic literature on new innovation patterns. The INFU futures dialogue starts by identifying emerging signals of change in current innovation patterns and then progresses by increasingly integrating diverse perspectives and knowledge sources towards consolidated innovation futures scripts. These bottom-up visions are then confronted with different possible socio-economic framework conditions and global mega-trends to finally synthesize consistent scenarios which integrate micro, meso and macro elements of possible innovation futures with particular emphasis on changes in the nature and content of research. Finally, policy strategy options are developed to prepare for the identified changes in innovation patterns.

New knowledge and European added value

Describing “new innovation patterns” requires a definition or at least an understanding of what is new. In this context, many empirical studies deliver evidence that “innovating innovation” is an evolutionary process rather than a radical one. We consider the linear, closed innovation model to be the traditional innovation pattern or paradigm. This model has become more networked, interactive and open in the last two decades; a development which has been supported by the use of modern information and communication technologies. In contrast, new innovation patterns such as crowdsourcing, systematic support for user innovations, extreme personalisation (make-to-order) or cradle-to-cradle innovation are considered as new forms of innovations.

Looking at many new innovation concepts such as open innovation, user innovation or design innovation shows that these “new innovation phenomena” tend to emerge in certain niches and then gradually diffuse in other fields and industries. Moreover, some of the “new concepts” such as open innovation combine already existing, empirically observed phenomena. The current widely debated concept of user innovations, for instance, can be traced back to the 1980s.

Thus, with “new innovation patterns” we mean novel emerging concepts, ideas and strategies of how innovation is organised, but also well-known trends such as open source software development, which are already of importance in specific industries or areas, but may have a larger impact or potential for other areas in the future. In this sense, specific concepts and strategies may be “new” for specific industries.

New innovation patterns also change our understanding and definition of what is innovation. Schumpeter, for instance, defined innovation in 1911 as “the introduction of a new combination”; later on in 1939 as “any attempt at doing things differently in the economic field should be considered as an innovation likely to provide the firm with a temporary advantage, and to generate profits”. However, the term ‘innovation’ is also used in a broad sense to mean doing new things and is applied in social and public domains as well.

Within the desk research of the academic literature, the consortium identified the following concepts, strategies, and paradigms (with their most important proponents where these could be identified) which have been discussed intensively in recent years:

- Open innovation (Chesbrough),
- User innovation (von Hippel),
- Value innovation (Kim and Maubourgne),

- Virtual customer methods (Dahan and Hauser),
- Innovation communities,
- Commons-based peer-production (Benkler, Herstatt and Raasch),
- Crowdsourcing (Howe, Brabham),
- Personal fabrication (Gershenfeld),
- Soft innovation and design innovation (NESTA, Stoneman, Verganti),
- User created content (OECD),
- Eco-innovation models (Stahel, Braungarth, Lovins),
- Service innovation patterns,
- State-driven innovation,
- Innovation in the public sector (Windrum and Koch),
- Transformative innovation (Steward, SPRU),
- Social innovation.

By summarising these concepts, the INFU team has selected the most important models in the academic literature. These rather broad concepts overlap to some extent and a number of other notions and approaches have been proposed in the literature which are referred to as well within the review. However, so far, no framework or taxonomy has been proposed to classify the various concepts.

The review of the academic literature also reveals that some concepts which have been addressed by the business press or on the web have not received much interest or attention from academics. Here, product tuning, modular reconfiguration, or interactive production can be mentioned.

In addition to the state-of-the-art literature review, the project team has scanned other information sources (business press, magazines, internet, etc.) to identify so-called “weak signals”. The team developed a framework to do so which also exploits results from another project (iKNOW project) conducted in parallel to INFU and funded under the Blue Sky Foresight Programme.

A weak signal is defined as a hint of a potential for change with a possible disruptive impact which is already apparent and visible, but has not yet entered the mainstream. In our context, a weak signal thus indicates a change in an innovation pattern with a potential of disruptive impact, which is not established as a common way of doing innovation (in a sector).

In total, 63 weak signals were identified and structured information is given for every signal of change. The identified examples and cases often combine existing ideas, concepts and strategies (which are also described in the literature) in innovative ways, show new applications and thus expand our thinking about possible innovation futures.

The weak signals can be clustered into 14 broad forms of innovation. The clustering was structured using existing concepts although new terms for novel innovation patterns were introduced as well. The following clusters of innovation patterns are distinguished:

- Idea Generation / Fuzzy Front End,
- Innovation Culture,
- Customer / User Integration,
- Crowdsourcing,
- Closing Innovation,
- Innovation Policy,
- Public Innovation,
- Social Innovation,
- Open Design / Open Objects,
- Global Knowledge Sharing,
- Attitude Towards / Awareness of Innovation,
- Non – Western Innovation / Shift in Innovation Gravity,
- Lifecycle Thinking in Innovation.

Key messages for policy-makers, businesses, trade unions and civil society actors

New innovation patterns may have diverse impacts which include, amongst others:

- implications of new innovation schemes for production patterns (distribution and location of production),
- environmental impact of new innovation patterns, in particular, user innovation,
- implications of new innovation forms for regulatory framework conditions (both enabling and controlling these innovations), e.g., what is the effect of Intellectual Property Rights (IPR) on the emergence of various innovation patterns?
- The role of current innovation agents (companies, researchers, engineers, designers, architects... the

so called "creative class"...) within new innovation patterns,

- peoples' attitudes towards innovation activities and their dependence on cultural context (e.g. innovation fatigue and passive consumer mentality versus individualisation and experience economy),
- business models enabling new innovation schemes,
- the relevance of the various emerging innovation concepts on the type of products, industrial sector, etc.,
- the relation between new innovation models and well-known global megatrends such as demographic change, environmental threats, urbanisation, etc.

For business managers and policy-makers, the identified weak signals reveal a diverse and rapid development of new innovation patterns. Apart from already known models and strategies such as open innovation and user innovation concepts, signals in the area of "Public Innovation", "Social Innovation", "Attitude Towards / Awareness of Innovation", and "Non – Western Innovation / Shift in Innovation Gravity" (see list of clustering of weak signals above) raise totally new questions and may trigger the further debate and scenario development process.

PROJECT IDENTITY	
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Duration	1 June 2009 – 31 January 2011 (32 months)
Funding Scheme	Collaborative Project
Budget	482,889 Euro
Website	www.innovation-futures.org
Further reading	Stamm, B. von, Trifilova, A. (2009) (Eds.): The Future of Innovation, Gower, Surrey. De Jong, J., Vanhaverbeke, W., Kalvet, T., Chesbrough, H. (2008): Policies for Open Innovation: Theory, Framework and Cases, Research project funded by VISION Era-Net, Helsinki.
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