Sam Inkinen & Jari Kaivo-oja

UNDERSTANDING INNOVATION DYNAMICS

Aspects of Creative Processes, Foresight Strategies, Innovation Media, and Innovation Ecosystems

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ABSTRACT

A central objective of the European Union's science and technology policies is to develop the innovation capacity of the economic area and to enhance the related creative processes towards higher efficiency and profitability. This has been defined as the economic, scientific and technological goal of the whole EU. The R&D work concerning innovation processes will involve the public sector, universities, and businesses alike.

The new idea and challenge in Europe is to combine the European cluster strategy with the new innovation paradigm (*open innovation*) and with the opportunities and future trends of *innovation media*. The rise of "innovation journalism" and "innovation media" as key notions and research fields reveals that the significant role of (social) media and journalistic practices has not been taken into consideration in the traditional *triple helix* model. In the ecosystemic view, the role of media and communications (both the traditional mass media and the new Internet-based services) is evident.

The main concern of this publication is to understand *innovation dynamics* and *innovation ecosystems*. Some of the key approaches and relevant fields include creative processes, new technologies, digital environments, media practices, business models, and strategic agility as well as futures studies and foresight. Some key factors and general elements that can/will create structural changes in the global innovation ecosystems are

(1) the (r)evolution of ICT (including so-called social technologies, mobile environments, and web 2.0 solutions)
(2) increased global pressure to create new *service innovations* to achieve a more innovative and productive service economy
(3) the increased *global competition* in various industries
(4) the increased pressure to find a better balance between business developments and *sustainability* demanded by global warming, climate change, energy issues, and related challenges.

Innovation, creative economy, and creative industries are examples of key concepts that spark a great deal of general interest and ambitious R&D projects. These concepts have, however, been somewhat "innoflated": *creative this* or *inno-that* have sometimes lost their true meaning or purpose. The use of the words "innovation," "creativity," etc. should be examined analytically and critically.

Keywords: *innovation dynamics, innovation ecosystems, innovation environments, serendipity, social technologies, creative economy, network society, innovation journalism, innovation media.*

PREFACE

A creative economy is the fuel of magnificence.
–Essayist and philosopher Ralph Waldo Emerson (1803–82)

A number of key terms and concepts have been grouped together in the recent debate over innovations and technology: knowledge society, information society, network society, informationalism, the Information Age, innovation economy, innovation environments, innovation ecosystems, business ecosystems, living labs, complex systems, autopoiesis, dominant design, KIBS (= Knowledge Intensive Business Services), STI and DUI principles, value networks, the creative economy, the creative class, creative buzz, learning regions, clusters and miniclusters, creative industries, media ecology, fitness landscape, open innovation, mobility, serendipity, swarm intelligence, crowdsourcing, social media, web 2.0, web 3.0, everyware, ubiquitous technology, digital competence, digital convergence, prosumerism, the net generation, IPR, etc., etc., etc.

In addition, "innovation media" and "innovation journalism" have recently been introduced as new theoretical concepts challenging the "old school" media thinking and practices. Major attempts to define the notion and the theoretical framework of *innovation journalism* and *innovation media* have already been made. A deeper conceptual analysis is, however, needed – not least because "innovation journalism" is a relatively young field of study.

The main concern of this publication is to understand innovation dynamics and innovation ecosystems in relation with the changes of economy, society, culture, and media. Some of the key approaches include creative processes, foresight strategies, and innovation journalism.

The publication has three parts. Part One is primarily written by Dr. Sam Inkinen and Parts Two and Three by Dr. Jari Kaivo-oja. Part One introduces concepts, theory, and the contemporary discussion on innovation economy, ecosystems, and rhetoric. Part Two discusses a number of seminal themes regarding innovations in organizations and networks, various business models, and innovation quality. Part Three concentrates on effective foresight systems and processes, strategic agility, and the fitness landscape.

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–Sam Inkinen & Jari Kaivo-oja

PART ONE

CONCEPTS, THEORY, AND CONTEMPORARY DISCUSSION

1. INTRODUCTION: INNOVATION AND "INNOFLATION"

"When memories exceed dreams, the end is near. The hallmark of a truly successful organization is the willingness to abandon what made it successful and start fresh." (Friedman 2005, 451)

These words of business writer, Professor Michael Hammer, seem relevant in the context of the discussion on creativity, creative industries, and innovation. The debate has been by no means scarce, but are economies, businesses, research groups, and technology developers heading in the right direction?

Maybe, maybe not. The main goal of the European science and technology policy is to develop innovativeness and related processes into a more sensitive, efficient and result-driven direction. This standpoint is listed as a goal in various instances with regard to economic, science, and technology policies, and it concerns the public sector, higher education, and business life alike.

How to meet this challenge in practice? Amongst other openings, some directions were given in a conference paper called *Homo Creativus* at the 24th *IASP World Conference on Science & Technology Parks* in Barcelona, Spain, in 2007 (see Kakko & Inkinen 2007, 2009). Contacts, connections and sometimes surprising meetings and bumps (*the principle of serendipity*) in the in-betweens of various scientific and business fields and between different organizations are of paramount importance to the contemporary innovation environment. The contact points between different societal actors have to be seen as one of the most important starting points of innovations and innovation potential in Europe.

Creativity, innovation, creative economy, and creative industries are examples of key concepts that spark a great deal of general interest and ambitious research as well as R&D projects. These concepts have, however, been somewhat "innoflated": *creative this* or *inno-that* have often lost their true meaning or purpose (ibid.). The same kind of exaggeration and unrealistic hype was earlier directed to all things beginning with *cyber-*, *digi-*, and *mobile-*. Thus, a thoroughly analytic view and a Hegelian *Anstrengung des Begriffs* (testing of the concept) with regard to the concepts that are part of the debate on creativity and innovation would be very welcome.[1] The use of the words "innovation," "creativity," etc. should be examined analytically and critically. The classical distinction between "ideas," "inventions" and "innovations" might turn out to be rather useful in this discussion.

On the other hand, the term *creativity* is used extensively, and, among other contributions, the ideas concerning the *creative class* by Professor Richard Florida (2002) have become key issues of dynamic regional development all over the globe. The values and principles of the creative class also seem to be directly linked with the processes and problematic aspects of the "creative economy."

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[1] Debate on technology and innovation has in recent years been disturbed by the fuzziness and ambiguity of terms. John A. Barry (1992) has described the discussion on technology with an appropriate word, *technobabble*. The content of words is, naturally, dependant on the definer and the context. Even if we do not take too tight a stand on the ways languages are used, it has to be stated that especially new, trend-like *buzzwords* are sometimes used carelessly and accompanied by (too) far-fetched rhetoric. On the other hand, right key words electrify discussion and, for example, the terms and concepts of *creativity* and *innovation* have proven their usefulness on many occasions.

According to the traditional definition, an innovation is a new product, a new process or a new organizational structure that enables an actor to be successful in the market. Amongst others, the Nordic Innovations Center (NICe) has stressed the importance of a holistic viewpoint in terms of innovation, and has stated that research results and inventions can be translated into innovations only if they are closely interlinked with commercial interests and economic goals (cf. Nilsson-Andersen 2007).

The traditional, closed innovation model is built upon the idea that one's own organization possesses all the necessary knowledge and know-how. Protecting these knowledge assets is considered a way of securing a competitive edge in the market. In recent years, however, debate over *open innovation* has gained a lot of ground. This change in the discussion is almost drastic enough to be called a paradigm shift. The concept of *innovation environment* includes much wider and deeper viewpoints than the traditional research on *innovation systems. Innovation environments* are affected, amongst other things, by the history and culture of the geographical region, behavioural patterns, and traditions acquired over time.

In the Nordic countries, the main feature of innovation processes is the so-called *triple helix* model, i.e. co-operation between the universities, the public sector, and the private sector. The new concept of *national open innovation system* offers an alternative to the "traditional" triple helix model and brings forth the idea that national innovation systems are no longer tightly closed national systems but function as parts in a complex, dynamic, and increasingly global context. (cf. Santonen et al. 2007)

The main question is how to create something new and valuable; how to enable creativity to take place, to "happen" in the context of individual personalities, organizational strategies and operational principles, and in the context of human interaction. Albert Einstein (1879–1955) once stated that "imagination is more important than knowledge."[2] Albert Szent-Györgyi, a Nobel Laureate in Physics, has presented a similar idea in a slightly different way: "Discovery consists of seeing what everybody has seen and thinking what nobody has thought."[3]

2 www.quotationspage.com/quote/703.html

3 www.quotationspage.com/quote/151.html

2. CREATIVITY AND INNOVATIONS: NEW APPROACHES

In recent years, *creativity* has been a keyword in the business world, educational institutions, and the wider discussion related to society. Creativity and innovations, creative work, creative industries, creative economy, "the creative class," innovation systems and innovation environments (cf. Ståhle et al. 2004), and other *buzzwords* have become key concepts and mantras that are not only met with huge interest but also with a lot of unnecessary frenzy or mania.

"Creativity and business," the theme of a conference titled *Interaktiivinen tulevaisuus & ihminen* [Interactive Future & The Human Being] held alongside the *Mindtrek* event in Tampere in 2005, is symptomatic of the Finnish discussion. In 2006, the University of Joensuu organized a seminar under the title *Luova talous – itääkö?* [Creative economy – growth?] The contemporary Zeitgeist (cf. Inkinen 1999a) was also showcased in the chosen name of a project by the University of Oulu; *CreaM – Creative Processes and Content Business Management.*[4]

One fundamental question that needs to be answered is whether the recent exchange of thoughts has resulted in something truly new or groundbreaking. Debate over the different aspects of creativity has been active among universities in various countries, research communities, ministries, government agencies, think tanks, and other networks. One reasonably recent example of the exchange of thoughts on the European level comes from the German speaking world; the publication *Die organisierte Kreativität. Kulturpolitik an der Wende zum 21. Jahrhundert* [Organised Creativity. Cultural Politics at the Dawn of the 21st Century] edited by Franz Morak (1999). The publication offers a glance at "organized creativity" from the viewpoint of areas such as education, cultural politics, design, and new media.

It is interesting to note that creativity has, in recent years, been closely connected to the wider discussion on the society and the economy. The discussion emphasizes themes such as (national) competitiveness and innovativeness. The *creative class* and the *creative economy,* as introduced by Richard Florida, have been discussed in detail by futurists and futures researchers both in Finland and internationally (cf. Wilenius 2004; Aaltonen & Wilenius 2002; Inkinen 2006). Florida and his followers argue that the self-acknowledgeable professionals of the creative industries tend to choose home and work environments (including cities and/or regions) that support and promote a rich and many-sided cultural life, offer a multitude of opportunities for participation in various activities, and have an atmosphere of spiritual openness (key issues being multiculturality, tolerance, and cultural diversity).

Florida's *The Rise of the Creative Class* (2002) has become an often cited key opus that could be described as the "bible of dynamic regional development." The book aims to underline the rise of the creative class in American metropolises. It looks at the structures of contemporary society from the viewpoints of regionality, regional development, information, and the socio-technical foundations of knowledge work. According to Florida, the creative class is found at the centre, at the core of society. Its values

4 www.cream.oulu.fi

and principles underline the links between cultural creativity and the structures of the information economy. The book aims to find out where new, thriving business takes place in contemporary society, and to understand where businesses based on the input of creative innovative professionals (knowledge workers) are moving to geographically. (cf. Kakko & Inkinen 2004).

According to Florida and his followers, creativity is a key driver of the information society. The roles of individuality, voluntary tribalism, and creativity are of paramount importance in the society of today. These factors have become essential for economic success and regional competitiveness. The knowledge workers – researchers, designers, programmers, artists, and other innovators – demand more than healthcare programmes from their employers and more than a sports stadium and a symphony orchestra from their home town and environment. The creative class values active and many-sided cultural services.

It might be good to note here that, according to sociologists Scott Lash and John Urry (1994), the new wealth of contemporary society has primarily been created by the producers of expert services. Producing special services (financial and cultural services, IT and ICT, educational services, innovation services, etc.) requires a high level of education and top notch professionalism. Florida (cf. 2002) and his followers include scientists, architects, designers, educators, artists, musicians, and entertainers in a single "class." Around this core of creativity, a wider group of knowledge workers is assembled (e.g. business, economics, law, and health care professionals). (Cf. Säisänen 2005, 28ff.)

It is generally agreed upon that in a post-industrial, (post)modern society technology develops, but we should not forget that social and economic structures develop, too. In fact, the most essential change in our societies during the last 50 years has not been the advancement of technology but *the change in our social structures and cultural life* (cf. Florida 2002). Globalization and the mobility of capital and work and a new set of values essentially shape current developments and our future paths. At the same time, information technology and computer networks have brought along a new set of rules that affect our lives. Digital technology, networks, ubiquitous computing (cf. Weiser 1991; Greenfield 2006), and other socio-technological trends have had a crucial influence in the way that the post-industrial society is built around *information, symbols,* and *knowledge capital.*

Florida's and his followers' view of contemporary society is based on a theory that argues that humane creativity has become one of the essential (if not altogether the most essential) drivers of economic growth in western societies. They argue that by understanding the rise and meaning of the new "class," we can also understand the processes of societal change and be able to influence our future proactively. This said, we have to understand that creativity is a many-sided issue and should not be limited to technological innovations, patents, new products, and the like. The Floridan view of the ideals and mechanisms of the creative economy reach out all the way to the fundaments of our societal and cultural processes. (cf. Florida 2002)

We can say that journalists and media professionals are a part of the Floridan "creative class." In fact, "innovation journalism" and "innovation media" are also specifically a task and a challenge for the "creative class." It is worth to remember that the working class used to have its own newspapers and media in the past. It is worth asking if the "creative class" also has its own press and media in the contemporary world – both in the form of traditional mass media (newspapers, magazines, radio stations, etc.) and the interactive new media (blogs and wikis, microblogs, web 2.0…).

All in all, it can be stated that creativity and innovativeness are key concepts that are loaded with challenges and expectations. In order to maintain a critical and analytic view, it has to be stressed that the recent discussion on creativity and innovation seems somewhat similar to the *hype* on digithis, cyberthat and mobilewhatnot of a while back (cf. Inkinen 1999b). The discourse patterns around such buzzwords undoubtedly call for reflective criticism or straightforward demystification (cf. Leppihalme 2006). In the Finnish context, it has been interesting to follow the government's interest in creating a "creativity strategy" which is meant to outline the future of creative activities and cultural policies. The Finnish Ministry of Education wrote on its web pages[5] (translation ours) some years ago that

> *Prime Minister Matti Vanhanen's first government programme included the creation of a nationwide creativity strategy, listing it in the programme under the chapter on culture politics. The efforts to promote creativity in society are not limited to cultural policies but reach beyond the administrative boundaries and beyond the scope of individual actors. The creativity strategy has been written from this standpoint. This is also where it differs from the national creativity strategies of other nations.*
>
> *The work on the creativity strategy has been pre-planned to reflect the theme at hand in its processes and ways of working. The nature of creativity is cherished.*

Talk on creativity has also been evident in the policies of the current cabinet, e.g. in the discussion on the new Finnish "innovation university" (Aalto University) and on the restructuring of universities and higher education as a whole. Various estimates and prognoses have stated that there is a need to restructure the organizations and management systems of Finnish universities. It has also been stated that the demands of globalization and the new competition are not being adequately met by the old structure of Finnish universities.

Outlines, such as the above-mentioned creativity strategy, have also been developed by other public institutions (e.g. Sitra – the Finnish Innovation Fund and TEKES – the Finnish Funding Agency for Technology and Innovation). Some have gone as far as to demand that Finland should become the most creative country in the world. Critical contemporary observers consider such declarations unrealistic. On the other hand, the concept of developing "national creativity" can act as a positive driver and a fruitful goal that promotes issues related to creativity in a proactive and concrete way. Often the reasons behind such high-wired visions and "missions" are related to worries about Finland's national economic competitiveness and the country's position in the global playgrounds of future markets. Sitra's focus programme on innovations and innovativeness (for the years 2004–08)[6] stated (translation ours), among other things, that

> *The success of Finland has mainly been based on knowledge and competence. Finland has devotedly developed its educational system, R&D, and business. The Finnish innovation*

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5 www.minedu.fi/OPM/Kulttuuri/kulttuuripolitiikka/linjaukset_ohjelmat_ja_hankkeet/luovuusstrategia/index.html

6 Sitra 30.8.2004.

system is one of the best in the world and Finland has placed well in international comparative studies on competitiveness and innovativeness.

However, we must look ahead. Competition is getting tighter and the traditional developed countries are now challenged by new actors such as India, China, and Brazil who are able to compete with Europe, Japan, and the US not only on the grounds of cheaper work force but with increasing knowledge and competence, too. Finland has to make sure that the Finnish innovation environment is top notch in the future as well and to ensure that Finland is able to produce competitive innovations and to attract investments, competent professionals, and businesses.

As a nation and as an innovation environment, Finland has its pros but its obvious cons, too. The global market opens up great possibilities for small countries, but the threat of not being able to keep up with the competition is real, especially if the available resources are not exploited efficiently and the new possibilities pursued actively.

According to Florida (2002) and his followers, it is characteristic of our time that economic and technological creativity is increasingly linked to artistic and cultural creativity. These new links and combinations of creativity should, indeed, give rise to the much needed new innovations and drivers of national competitiveness. This can be seen in the recent discussion and problems related to copyrights and other immaterial property rights (IPRs).

In the current economic structure, wealth is more and more based on intellectual, culture-bound symbolic property. Futurist, Professor Markku Wilenius presents a thought in his book *Luovaan talouteen. Kulttuuriosaaminen tulevaisuuden voimavarana* (2004) [Towards the Creative Economy. Cultural Competence as a Resource of Tomorrow] that could be considered as one of the heuristic mottos of the recent debate over creativity (translation ours):

We are moving towards an economy that is primarily driven by cultural competence and the humane and organizational creativity born out of it. Cultural competence includes all the human abilities and organizational factors that enable us to make good use of our cultural capital in the interaction between individuals and in all activities of production. If we are to promote Finnish creativity and innovativeness, we have to ponder what sorts of cultural competence pave the way for creativity and innovations. (Wilenius 2004, 11)

Content business, the management of creative processes, and the development of popular and urban culture are discussed in the above-mentioned book, for example in the following way: "The role of symbol production and aesthetics have dramatically increased in business life. This shows e.g. not only in the growth of communication and media businesses themselves but in the growth of the meaning of communication and media to other areas of business. Product aesthetics and 'symbolic literacy' show in the visual developments of advertising, work environments, shopping centres, restaurants, and whole urban areas. "(ibid., 37)

3. INNOVATION DYNAMICS: THE MEANING OF SYNERGY, NETWORKS, AND "POSITIVE ACCIDENTS"

This same point can be generalized to life: maximize the serendipity around you.
–Nassim Nicholas Taleb (2007, 204)

Decision-makers of science and technology policies all around the world stress that *innovativeness* is a prerequisite for development and future competitiveness. It is often stated that an innovative environment makes organic growth possible as a means to enlarge the shared, common good. An innovative environment comes with a positive culture of "doing" and polishes the image of the region and the organization. Critical mass, innovational spirit, and a "creative buzz" are needed. (Inkinen 2006)

This is just as true where industries and business life are concerned. The demand for innovativeness is crucial for the success of businesses, organizations, and geographical regions in the face of ever-tightening global competition. One key challenge is the management of creative processes. In 2004, the Finnish Parliament published an opus with the title *Innovatiivisten ympäristöjen ja organisaatioiden johtaminen* [Management of Innovative Environments and Organisations],[7] which states (translation ours) that

> *Regions and businesses need to be able to increase their innovativeness continuously. Widespread co-operation, creating related structures, and guiding related processes form a huge challenge that has to be met in order to create functioning innovation systems. We are facing a multidimensional renewal task that calls for change in our physical, operational, and mental structures. (Ståhle et al. 2004, 5)*

Again, the social aspects of human networks and human development are essential. PowerPoint presentations and memos calling for the goals for innovativeness too often forget that, in the end, we are discussing an issue closely tied to humane and social action. Even if we talk on the level of innovation systems, all development and new ideas are sparked by *creative individuals* who have their own needs and desires. In the 1990s, there was a lot of talk about innovation systems. According to a definition (translation ours)

> *an innovation system is a term used to describe the different actors and their interdependent relations, who take part in the creation, dissemination, and use of knowledge that is economically exploitable [...]. It is important to understand that an innovation system is by nature a social system and this underlines the meaning of interaction between humans [...].*

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7 Eduskunnan kanslian julkaisu 6/2004.

> *The attention paid to innovation systems has increased our understanding of the systemic and interactive nature of innovations. Nevertheless, a lot of work and research is still needed to fully understand the multidimensional interaction, management, and competence related to innovations and innovativeness. (ibid., 14)*

Today, in addition to "innovation systems," we also speak more of innovation environments (cf. Kakko & Inkinen 2005; Inkinen 2006). A thriving innovative cluster is often a social organization where the various actors of the academic, cultural, and business worlds meet in a fruitful way. It has to be stressed that alongside strategic planning and decisive management, accidental meetings, and fruitful serendipitous bumps play a major role in innovation processes. A key term used is, indeed, *serendipity,* (cf. Hakala 2002, 227–228) which is discussed interestingly and thoroughly in *Serendipity. Accidental Discoveries in Science* by Royston M. Roberts (1989) and in Richard Eyre's *Spiritual Serendipity. Cultivating and Celebrating the Art of the Unexpected* (1999).

Serendipity means the accidental, unplanned encounter which can lead to a better-than-intended outcome (cf. Kakko & Inkinen 2007; Inkinen 2006). In a way, serendipity equals a lucky chance, a fruitful accident, or a positive collision. Merriam-Webster Online[8] defines serendipity in the following manner:

> *Main Entry: ser·en·dip·i·ty*
> *[...]*
> *Function: noun*
> *Etymology: from its possession by the heroes of the Persian fairy tale The Three Princes of Serendip*
> *: the faculty or phenomenon of finding valuable or agreeable things not sought for*

The definition refers to an old Persian fairytale where the three princes of Serendip travel to far-off lands to search for a magical secret poem that would put threatening dragons to sleep. During their travels, the princes encounter such fascinating and wonderful things that they nearly forget the reason for their travels. It might be interesting to note that the World Technology Network mentions *happy accidents* as one of their goals:

> *About World Technology Network*
>
> *The World Technology Network is a London-headquartered organization that was created to "encourage serendipity" – happy accidents – amongst those individuals and companies deemed by their peers to be the most innovative in the technology world. WTN's areas of interest range from IT and communications to biotech, energy, materials, space, as well as related fields such as finance, marketing, policy, law, design, and ethics. Each year, WTN members are brought together through an ongoing global series of Roundtable Dinners, Chapter Meetings and other events. WTN also publishes "World Technology Intelligence," a*

8 www.m-w.com/dictionary/serendipity

> *bi-monthly magazine about what is imminent, possible, and important in the technology world, written largely by its own members – the people driving the most significant innovations. Central events in the WTN calendar include the annual World Technology Summit and World Technology Awards – the culmination of a global judging program through which new members are nominated and selected and by which the network grows and is refreshed.*[9]

It is worth stating that concepts such as serendipity and chance are not unproblematic, nor is the discussion around them. It is also relevant to say that we live in a more fragile, complex and connected world than ever before – even if the "networked society" (cf. McNeill & McNeill 2003) is not, historically speaking, a new issue. It is often emphasized that success today is, as it has been in the past, enabled through networking and concrete cooperation. These standpoints can be considered prerequisites for (academic) research and development. Professor Wilenius (2004, 28) endorses this by saying (translation ours):

> *Networks are the form of social organization of this new era, cultural competence is its most essential competence and creativity its main driver. Competence in the network society differs from that of the industrial society. At its core are human management and the ability to create trust. It is ever increasingly based on questioning existing solutions and creating new innovations. Success in network society requires the ability to draw the right conclusions from the megatrends that affect the structure and processes of the society. These, in turn, show that economic growth is more and more based on immaterial goods and that a shift from exploiting natural resources towards the use of immaterial and human resources is taking place.*

Cooperation networks come in various concrete forms. A few examples of cooperation networks discussed in the literature of the social sciences are *supply networks* (just in time), *strategic alliances* (airlines), *production networks* (product licenses), *innovation networks* (cooperation between industry and universities), *client networks* (product development in cooperation with clients), *standardization coalitions* (e.g. businesses supporting a certain standard for the next generation of mobile phones), and *policy networks* (policy related cooperation between governmental, public authorities, and other actors). In addition, subcultures and ground level organizations cooperate with each other in a creative and networked manner, and this cooperation is increasingly global and multicultural, and it makes good use of social media applications on the Internet and on mobile networks.

As stressed above, it is crucial to understand that cooperation is undertaken by people, not by organizations. Developing cooperation built on trust and a real, open interaction between people is a challenging task. Experiences from businesses, communities, and regions suggest that successful cooperation between institutions and individuals relies on a shared willingness and *trust* between the partici-

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9 http://funredes.org/english/institucion/institucion.php3/docid/439

pating people and communities. Understanding the theory and practice of networks, Albert-László Barabási (2003, 202) sums this up:

> *The most visible element of this [organisatorial] remaking is a shift from a tree to a web or a network organisation, flat and with lots of cross-links between the nodes. As valuable resources shift from physical assets to bits and information, operations move from vertical to virtual integration, the reach of business increasingly expands from domestic to global, the lifetime of inventories decreases from months to hours, business strategy changes from top-down to bottom-up, and workers transform into employees or free agents.*

4. THE CHALLENGES OF OPEN INNOVATION

Both in academia and in praxis, growing attention has been recently devoted to the concept of *open innovation*. Henry Chesbrough (2003) describes how organizations have shifted from so-called closed innovation processes towards a more open way of innovating (cf. Torkkeli et al. 2007; Torkkeli 2008; Hilmola & Torkkeli & Viskari 2007).

Traditionally, new business development processes and the marketing of new products have taken place within the firm $ boundaries (Figure 1). The open innovation model is a relevant new concept also for non-economic innovations. This new, gradually developing research tradition is becoming more and more important.

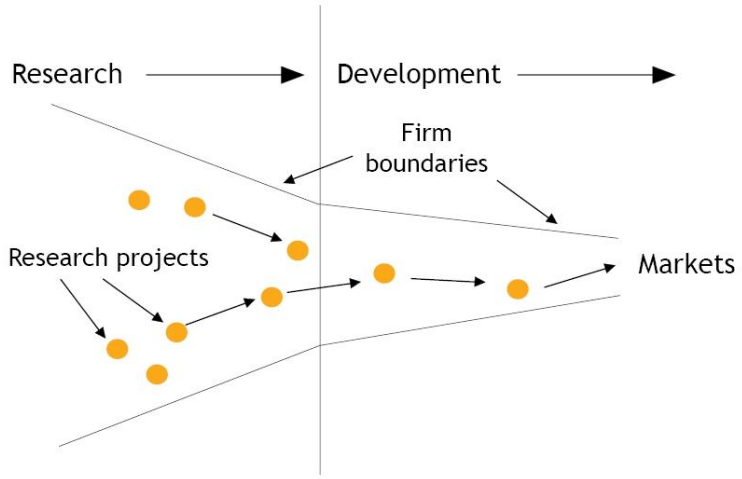

Figure 1. Closed innovation paradigm (Chesbrough 2003, xxii).

Several factors have led to the erosion of closed innovation. First of all, the mobility and availability of highly educated people has increased over the years. As a result, large amounts of knowledge exist outside the research laboratories of large organizations. Furthermore, when employees change jobs, they take their knowledge with them, resulting in increasing knowledge flows between companies. Secondly, the availability of venture capital has recently increased significantly, which makes it possible for good and promising ideas and technologies to be further developed outside the business organization. Besides, the possibilities to further develop ideas and technologies outside the organization are growing, for instance, in the form of spin-offs or through licensing agreements. Finally, other organizations in the supply chain, e.g. suppliers, play an increasingly important role in the innovation process.

As a result, organizations have started to look for other ways to increase the efficiency and effectiveness of their innovation processes; through active search for new technologies and ideas outside the firm, but also through cooperation with suppliers and competitors in order to create customer value. Another important aspect is the further development or out-licensing of ideas and technologies that do not fit the strategy of the organization. Open innovation can thus be described as: combining internal

and external ideas as well as internal and external paths to market to advance the development of new technologies (Figures 2 and 3).

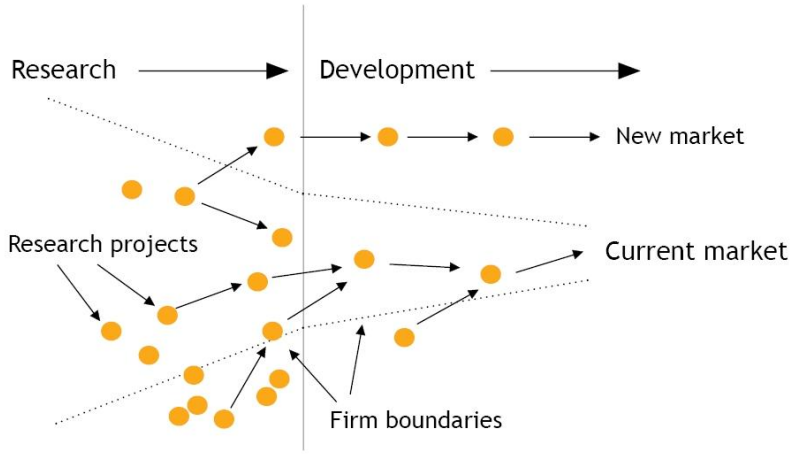

Figure 2. Open innovation paradigm (Chesbrough 2003, xxv).

One interesting aspect of the open innovation model (Chesbrough 2003) is that it does not take non-economic innovations into consideration; only new markets are described as potential places where innovations are outsourced (see Figure 2). Accordingly, it can be concluded that the open innovation model could be developed so that it also takes non-economic innovations into consideration (see Figure 3).

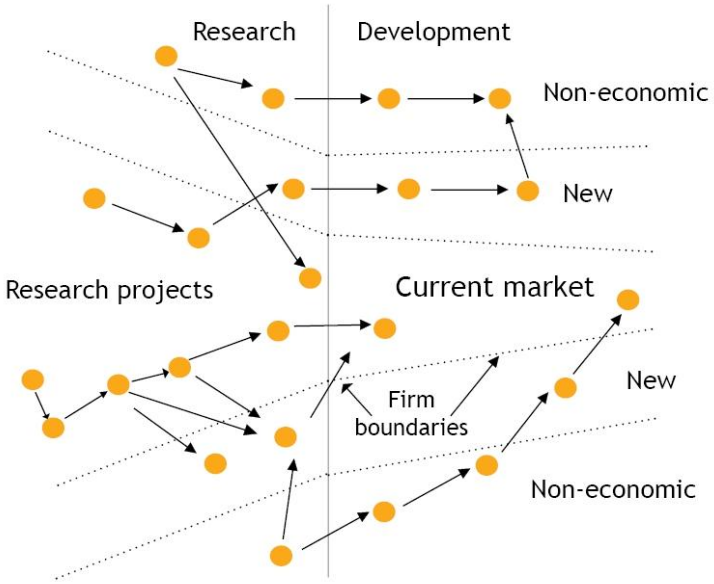

Figure 3. Open innovation paradigm with non-economic innovations.

The open innovation model implies that in the first place, the shift described above means that organizations have to become aware of the increasing importance of open models and practices of innovation dynamics. Not all good ideas are developed within the business organizations, and not all ideas should necessarily be further developed within the boundaries of the business organization.

5. FLOW, HASTE, IDLENESS – CHALLENGES OF CREATIVITY IN WORK AND R&D ENVIRONMENTS

The mindset of a creative person has been outlined by the Hungarian-born creativity researcher Mihaly Csikszentmihaly (1996, 1997, 2003). He has coined the term *flow,* which is used to describe a deep feeling of happiness where everything just seems to succeed with no effort. Flow can be a part of work or leisure time and it is a deep, transcendent experience. During a flow period, awareness of oneself disappears and it can be compared to a supernatural experience.

How does a person create? A paradox of creativity is that it can be learned, but not necessarily from text books. However, we must agree that there are varying opinions on this issue. While some experts claim that it is easy to learn or to teach creativity, others say that it is impossible. No matter what the truth is, bookstores sell a whole variety of "ABCs of Creativity "as well as more substantial handbooks. An (academic) example of the latter could be *Handbook of Creativity* by Robert J. Sternberg (2002).[10]

Competition refines, it is said. Many contemporaries state that a crisis also refines. Deadlines or other severe pressures may give rise to magnificent ideas and innovations, while crises and conflicts have given birth to a great number of new solutions. Many people have experienced how the creative mind still functions, even though the person is utterly tired, stressed out or burnt out. Maybe this is grounds for stating that creativity is often born out of extremes; either idleness or utter necessity.

It is interesting to note that the *slow life* phenomena (including *slow food, slow travel*, etc.) have been growing all around the world in recent years. Time management and focus on the core activities are key issues also in the context and practices of innovation journalism. Competition and tight schedules often kill all spontaneous creativity.

In addition, the ever worsening atmosphere in our workplaces has also been a key issue in recent years. It is easy to list aspects that restrict creativity: external evaluation, fear of job loss, a feeling of Big Brother watching, etc. Conflicts are, of course, a part of a creative community as well, but there the contradicting opinions related to new ideas tend to be ultimately fruitful. A key issue is how to combine competition, creative freedom, and profit-making responsibilities. Another problem is how to bring knowledge about creativity into practice. Creative people are often sensitive. On the other hand, they can also be prima donnas with gigantic egos. Educational institutions and workplaces are challenged to tolerate difference.

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[10] "The goal of the *Handbook of Creativity* is to provide the most comprehensive, definitive, and authoritative single-volume review available in the field of creativity. To this end, the book contains 22 chapters covering a wide range of issues and topics in this field. The chapters are intended to be accessible to all individuals with an interest in creative thinking. Although the authors are leading behavioral scientists and most readers are likely to have an interest in behavioral sciences, those involved in the natural sciences and humanities will find much that appeals to them in the volume, especially because so many of the examples and even case studies draw on the natural sciences and humanities. "(Preface, Sternberg 2002, ix) The main sections of the book are as follows: I Introduction, II Methods for Studying Creativity, III Origins of Creativity, IV Creativity, the Self, and the Environment, V Special Topics in Creativity, VI Conclusion.

How are things in real life? Not necessarily too well. Some years ago, the *Financial Times* discussed how creative and differing people are positioned in organisations. The difference between what is said in speeches and the reality is apparent. Companies big and small declare that *thinking out of the box* is their goal and a prerequisite for success. In practice, the outcomes for thinking on one's own, regardless of existing schemes, models and set rules, are often not positive at all. This is why people with original ideas and true creativity are not particularly successful in the actual business world.

Besides attempts to conceptualize and to study creativity, action has been taken to enhance creativity in practice. Perhaps a creative community is more like an *organism* than a traditional organization (cf. Kakko & Inkinen 2004, 2005, 2007). Furthermore, maybe problem-solving inside an organization is first and foremost a *process* that includes various identifiable and separable phases. In his article *Luova toiminta organisaatiossa* [Creative action in organizations], Yrjö Toivola (1984, 199–200) made references to studies made at the State University of New York in Buffalo that outline the development of problem-solving as a process as follows (translation ours):

> *1. Problem, challenge, opportunity, outlining*
> *Understanding that an opportunity to create something new, something better exists; intuitive knowledge, as well as a vision, might be a trustworthy guide at this phase (as well as in phases 3 and 4), because actual, fact-based, knowledge and its "mending effect" always come in too late.*
>
> *2. Fact phase*
> *Digging out the real facts in order to find the core of the problem that one is about to solve.*
>
> *3. Problem phase*
> *Identifying the actual problem according to the facts.*
>
> *4. Idea phase*
> *The shaping of alternative solutions.*
>
> *5. Solution phase*
> *Refining and polishing the chosen solution to make it usable and implementable.*
>
> *6. Approval phase*
> *Having all the actors who need to take part in the actualization of the chosen solution in order to make it successful to approve with it.*
>
> *7. Realization phase*
> *The arising (new) problems, or newly identified parts of the original problem, may force the process to be started anew or some phases to be gone through again. Several phases may have to be run through multiple times even before the realization phase has been reached.*

A creative (work) environment is challenging, free, dynamic, supports ideas, is emotionally safe, and its atmosphere promotes humour. In such an environment, debates are considered positive, conflicts constructive, risk taking is allowed and, in the end, new ideas have enough time to take shape.

An interesting phenomenon of our time is active project work around the themes of creative and innovative environments. One such R&D project was *netWork Oasis* (Joensuu Science Park, Finland) that focused on future challenges of knowledge work(ers) with an emphasis on increasing work capacity and creative work environments.

The project took a view on creativity, regional attractiveness, and knowledge work(ers) using three i's: (1) *instruments,* (2) *interior,* and (3) *interaction.* netWork Oasis aimed to develop a community where the various actors of the academic world, arts, and business life meet in a fruitful way – without forgetting the serendipity principle. During the project, key words like "network hunting" and "network incubation" were used. One of the central mottos of the project can be summed up in the phrase "respect serendipity." (cf. Kakko & Inkinen 2004, 2005, 2007, 2009)

The key ideas and principles of the netWork Oasis project have been further developed by *Global Oasis Network*[11] (Karostech Ltd). The ideal clients and workers of Oasis environments are active individuals who have the desire to maintain various kinds of social networks and to get to know new interesting people and communities. They take moving beyond and across organizational boundaries for granted and intuitively create professional networks (*ad hoc* organizations) if the situation or goals so demand. These types of individuals have a healthy self-esteem – they are professionals who want to work in an environment that is as open as possible, an environment that is interconnected in all possible directions (*win-win / open source / open innovation*), and that is built upon the ideals of equality, satisfaction, and collaboration.

The starting points and the management of creativity are supported through various technological solutions. Many R&D projects have a bottleneck where good (but scattered) *ideas* ought to be refined and made real in the form of *concepts* or *prototypes* that could, in turn, be further developed into innovations. Recent years have brought about specific innovation tools that act as idea storage, promote "swarm intelligence" and "crowd sourcing" (cf. Surowiecki 2004), and follow the principles of *social media* (web 2.0). They include conversational and ideating forums and support open innovation practices in the R&D processes and strategic decision-making.

[11] www.globaloasis.fi

6. CONTEMPORARY AND FUTURE HUMANS: HOMO LUDENS, HOMO AESTHETICUS-INFORMATICUS, HOMO CREATIVUS…

Creativity, innovation, and *flexible processes of action* currently seem to be highlighted as essential starting points for developing work life and the economy, and this will increasingly be the case in the near future. It seems clear that the innovators, experts, and knowledge workers of the "creative economy "possess loads of human capital and seek various kinds of experiences to develop their own minds, methods, and models of action as well as their technical and technological toolkits. Such people are characterized by the *ethos of creativity* and by multicultural competence(s). Following the lines of Richard Florida (2002), who has risen to the status of an international "guru, "the *creative class* can be viewed as an interesting condensed mix of the bourgeois and the boheme.

It is somehow symptomatic that the term *homo ludens* has become popular in the contemporary debate. We have understood that the human is not merely a *homo economicus* of economic rationality nor the engineering blacksmith of *homo faber,* but a playful human (*homo ludens*) as cultural philosopher Johan Huizinga stated as early as 1938 in his classic work of the same title. Huizinga's main idea is that even "unnecessary "challenges seem to play a big role in the advancement of the human race. Cultural life, works of art, games, and sports are deeply rooted phenomena of humanity, even though they are not the results of straightforward need or necessity.

Homo ludens has been a key term, not only in academic discourse but, for example, in the advertising world. As an opposite to the traditional *homo economicus* or *homo faber* who stress the importance of sense, achievement and quantity, *homo ludens* knowingly seeks for new experiences, plays around with possibilities, embraces the idea of freedom, and is happy to take risks to obtain new sensations.

A reference to the French word *bricolage* might add some interesting depth to this discussion. "Bricolage "is used to mean the building, the assembly or hobby-like handcrafting (cf. Leppihalme 2006), and it acts as a nice metaphor of creative processes and the management thereof, since creativity is often defined as a process of assembling where something extraordinary is built. It combines separate and sometimes distant elements into new combinations to fulfil a certain need or certain needs (or to be useful in some other way). The process of creativity can also be defined as a process to create a product or a service that can be considered a new one to its creator or someone else. (cf. Ruth 1984, 21–22)

Other phrases starting with the word *homo* have been used to describe the contemporary members of the information and media society. Aki Järvinen (1999, 170), a researcher of digital culture, has used the phrase *homo aestheticus-informaticus* to describe the knowledge-intensive humans who nevertheless stress the importance of aesthetic values and new sensations (art, design, experiences, entertainment industry, etc.). Apparently, the contemporary human is, indeed, *homo creativus:* the creative contemporary actively searching for himself and for the future. As a conclusion, it can be said that the significance of creativity is growing and it is bringing new challenges to innovation journalism and media.

7. ANATOMY OF INNOVATION

Now, to begin the Hegelian testing of the concept with the first key question: what is innovation? In short, innovation can be defined as a new product, new process, or new organizational structure that enhances the chance for success on the market. The many-sidedness of innovations, the (Finnish) national innovation structure, and ecosystemic thinking have been discussed, amongst others, by Antti Hautamäki (2007).

Hautamäki, who used to work as a research director and innovation specialist in the Finnish Innovation Fund Sitra, started working as a research professor (innovation) at the University of Jyväskylä in March 2009. He has presented and commented on innovations and innovative action from various standpoints and described the main concepts of innovation in the following manner (translation ours):

> *Ideas, inventions, and innovations are often distinguished from each other. An idea is a preliminary thought or a mental image of a new device or solution. An invention, on the other hand, already exists, but it is not applicable or commercial as such. An innovation is a novelty that is applicable in practice. Typically, innovations are commercialized products or services. The route from an idea to an innovation is often long and includes a number of different phases. (Hautamäki 2007, 110)*

When pondering on the deeper meaning of concepts, it is fruitful to look back in time and find out what classic thinkers have written and to see how they have argued on different aspects of the issue at hand. The historic causal connections of many concepts are often revealed through the *classics*. Hautamäki refers to the pioneer of economics and innovation research, Joseph Schumpeter, who has stated that innovations consist of bringing a new product to the market, implementing a new means of production, opening a new market, opening a new source of raw materials or semifinished goods, or creating a new industrial organization. The concept of innovation includes, according to current understanding, process innovations, production innovations, organizational innovations, and social innovations. (ibid., 110 –111)

It is justified to say that Schumpeter is the father of the so-called *evolutionary economics.* In fact, this area of economics is sometimes referred to as *neo-Schumpeterian economics* or *neoschumpeterianism*. It is a line of research that is especially interested in research on the *change in technology*. According to evolutionary economics it is *technology* that forms the dynamic core of the development of economies, economic growth, and our societies as a whole.

Technological change is generally thought to be born out of innovations. The research paradigm is formed primarily of the social and economic aspects that form the boundaries and trends of innovativeness and that draw out the future direction of various processes. The main principles are represented in such key words as *change dynamics, dominant design, learning processes, continuous competition,* and *creative destruction.*

The "hard" Darwinian influences are apparent already in the name of evolutionary economics. Tarmo Lemola states that this line of research has borrowed concepts from the theory of evolution and created models of thought, which are applied in research that concentrates on the birth and dissemination of technological innovations. Alongside the concept of *evolution* itself, the borrowed concepts include *variation, choice,* and *adaptation.* In addition, evolutionary economics underline the significance of history (hereditary factors in the theory of evolution), the cumulative nature of development, discontinuation (mutations), etc. However, socio-biological viewpoints are not promoted through evolutionary economics. (Lemola 2000, 150)

The main ideas of Darwin's evolutionary biology are natural selection and the origin of species. Darwinian evolutionary biology and modern biological theories have created the starting point for the term *ecosystem,* which is widely used in economics and innovation research as well. Again, we should not forget the history. In fact, according to Hautamäki, the idea to describe business environments as developing ecosystems is not new as such. Thorsten Veblen criticized the classic model of economic balance already in the late 19th century and emphasized the ability of institutions to adapt to ever-changing circumstances of the market. (Hautamäki 2007, 128–129)

According to Veblen and his followers, competition is a good starting point because it drives development further in a dynamic fashion. It is also worth noting that Schumpeter underlines the role of *businesses* where the creation of innovations and economic growth and development are concerned. When we track down the historic (scientific) origins of evolutionary economics, we notice the obvious influence of classic economists such as Adam Smith, Karl Marx, and Alfred Marshall.

The following innovation models are inspired by the innovation category model of von Stamm (2003, 49). Her model divides innovations to incremental and radical innovations and to existing market and new market innovations. To grasp the new role of non-economic innovation, we can add non-economic innovations to her model. In this reshaped innovation category model, there are six innovation categories (A, B, C, D, E, and F). Figure 4 presents conventional trends in the market and the society. According to this approach, innovation tends to develop in the long run towards the incremental and existing market system. These conventional trends are linked to the closed innovation model, not to the open innovation model. In Figure 4, non-market boxes have been added to von Stamm's conventional innovation category model.

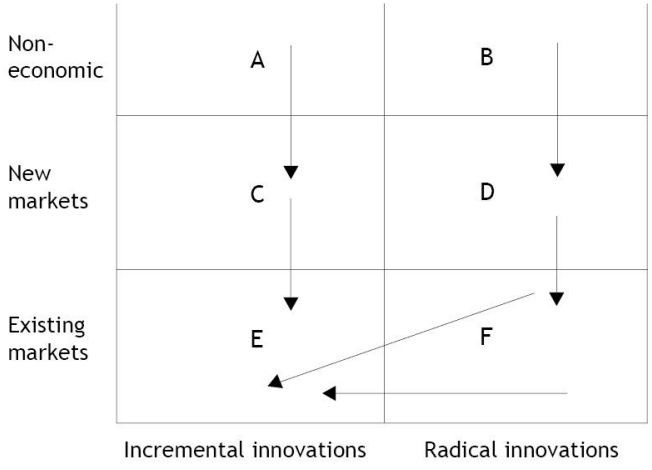

Figure 4. Innovation category model: typical innovation processes.

Figure 5 presents non-conventional, countervailing trends in the market and the society. According to this alternative and unconventional approach, innovations can also be developed in the long run towards new markets, the radical innovation model, and towards non-economic systems. These unconventional trends are linked to the open innovation model, not to the conventional closed innovation model where innovations tend to be incremental and placed in the established markets.

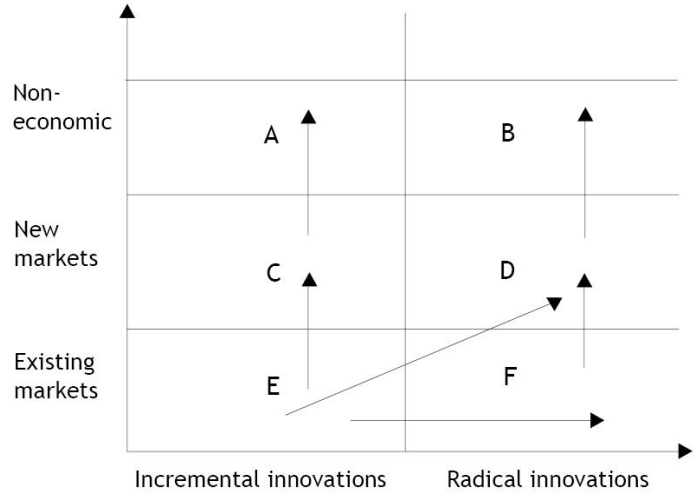

Figure 5. Innovation category model: countervailing open innovation processes.

8. MEDIA OF INNOVATIONS, INNOVATIONS OF MEDIA

The main goal of the science and technology policies of many countries is to develop the innovativeness and related processes towards a more sensitive, efficient and result-driven direction. This standpoint is listed as a goal in various instances regarding economic, science and technology policies, and it concerns the public sector, higher education, and business life alike. The starting points of innovation politics can be summed up in the following manner:

> *Innovation politics is based on the view that technological advancement and innovations are the seeds of long-term economic growth. These, in turn, require the creation and dissemination of knowledge of areas that do not have a completely functioning marketplace. Businesses have no resources or motives to produce generally useful, non-profit knowledge. Basic research and education require governmental funding. If these were to be left for the responsibility of businesses, their spectrum would be rather limited and the emphasis would be on the special interests of the businesses. (Hautamäki 2007, 112; translation ours)*

The article quoted above, "Suomen innovaatiopolitiikka verkottuneen tietotalouden aikakaudella" [The innovation politics of Finland in the era of networked knowledge economy] has been published in the book *Innovaatiomedia. Journalismi tulevaisuuden tekijänä* [Innovation Media. Journalism as a Driver of the Future, 2007]. "Innovation media" and "innovation journalism" are good examples of new terminology born due to the recent changes in the innovation economy, innovation processes, and (digital) ecosystems.

It is wise to discuss this issue in little more detail. The new paradigm of *innovation journalism* has been under debate also in Finland – largely due to the impact of David Nordfors who currently works in Stanford. Innovation journalism is a new journalistic genre or standpoint, which deals with innovations from a wider, more general level. Amongst other things, it deals with the direction science and technology is heading to as well as with industrial development processes and immaterial rights.[12]

One might add that innovation journalism is often obviously *futures journalism*, where the more traditional fields of journalism (science, economy, technology, and politics) meet each other as a sort of a hybrid. Innovation journalism is a challenge for media, editorship, and the education of journalists because the complex world and the many-sided nature of innovation and innovativeness require many-sided and deep knowledge and competence: the ability to gather information from various and differing sources, to conduct deep analyses, trace complicated causal connections and to spread this information around in a clear and plausible manner to a potentially very heterogenic audience.

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12 http://fi.wikipedia.org/wiki/Innovaatiojournalismi

The above-mentioned book, *Innovation media,* includes detailed articles by Erkki Kauhanen ("Journalismi tulevaisuustyönä" [Journalism as Futures Work]) and by Research Director Jari Kaivooja ("Tulevaisuudentutkimus, journalismi ja muuttuva mediakenttä" [Futures Studies, Journalism and the Changing Media Field]). Currently working as the Head of Communications in Metla, the Finnish Forest Research Institute, Kauhanen has done a lengthy career in journalism and is also experienced in the field of innovation journalism. He sums up the mission and goals of innovation journalism in the following manner (translation ours):

> *In innovation journalism, media acknowledges its share of the responsibility for the economic development of the society. On one hand, this is a result of considerations related to media ethics, but on the other hand of the idea that media is not an external observer of an innovation system, but a natural part of it – whether it wants it or not. The way media operates has a direct effect on how the system performs. Media can search for its effect willingly or cause an impact indirectly, with eyes closed. The latter option might sound intriguing if one does not want to address the question about the responsibility of journalism. Such an option would not free journalism from its responsibilities; it would merely hush the discussion thereof. (Kauhanen 2007, 29)*

From the viewpoint of the current *innovation economy,* the interdependencies between the society, businesses, universities, and media are of paramount importance where national economies and ecosystems are concerned. In the Nordic countries, the main feature of the development of the innovation processes is the so-called *triple helix* model, i.e. the co-operation between the universities, the public sector, and the private sector. However, we should remember that Silicon Valley has adopted a more market-oriented model and the Asian countries a more centralized model even though the old principles of *command economy* have been changed. Kauhanen states (translation ours) that

> *the job of businesses in the innovation economy is to create, commercialize, and market innovations. The public sector creates structural and operational possibilities. In this organic "body," media acts like the circulatory system. The flow of information and debate created by media acts as a societal touchpoint where a surprisingly large share of the information relevant to both businesses and the public sector is transmitted, and where a great share of related conversation is held. This is how media affects the corporate accounts and the national economy. In democracies, press is also the main forum of the debate between the elites and the larger audiences. In a true civil society, the voice of ordinary citizens is heard in the media. (Ibid., 29)*

One could add that the Habermasian ideas of communicative action and of non-authoritarian communication are classic principles interestingly linked to the current debate on journalism and the civil society. Such themes have also been brought up in the conversation on social media, alternative channels of communication, Internet forums, web 2.0, etc.

How well can the "citizens' voice" be heard (or can it be heard at all) in the midst of the current mediasphere characterized by media wars, contemporary huffing and puffing, and "reality" TV, is its own

interesting question. Critical media research has a great deal to comment. On the other hand, the rapid growth of social technologies and Web 2.0 applications in recent years has significantly democratized computer networks as well as the wider power structures. The effort required to speak one's mind or to present one's opinion has become reasonably smaller – or at least that is what we would like to think.

9. KEY CONCEPTS: CLUSTERS, INNOVATION SYSTEMS, ECOSYSTEMS

Let us look at the past again. "Clusters" and "national innovation systems" are concepts that influenced researchers, experts, and decision-makers widely already in the 1990s.

One of the main authorities of cluster theory has been Professor Michael Porter. The world-renowned strategy guru sees that clusterization and national competitive advantages are closely bound together. He states that the main question is to reach critical mass and about being able to concentrate on the relevant issues on the national level. Later, interest has been shown towards regional innovation clusters as drivers of the national innovation system.

The development of *clusters* as well as of national and regional innovation systems has been emphasized especially in the Finnish science and technology policies. The Science and Technology Council of Finland, chaired by the Finnish Prime Minister, largely relies on the concept of innovation systems and related thinking. Furthermore, national innovation systems also played a major role in OECD's TEP programme some years back.

On the other hand, the concept of national innovation systems has had its critics. The opposition has feared and criticized the fact that the discussion on innovations and innovation systems leads almost naturally to the glorification of technical and engineering sciences at the expense of humanities and social sciences. In addition, it is wise to note that science and the academic world are by nature international, and thus are not limited by the tight borders of a nation.

Let us look at the past once more. Alongside clusters, discussion has been recently active on *innovation systems.* Antti Hautamäki (2007, 112–113; translation ours) states that

> *the concept of innovation system was born in the 1980s to describe the importance of innovativeness to national economies. The pioneer of the field, [Christopher] Freeman defined national innovation system to be a network of public and private institutions whose activities and interaction create, modify, and spread out new technologies. This definition emphasizes the networking and interaction of the institutions, which form the dynamic structure of the system. On the other hand, this definition only considers technologies and does not discuss process, business model, or social innovations at all.*

Discussion on national innovation systems creates various problems and sparks justified criticism related to the concepts and their borders (cf. Nelson 1993). Much alike the terms "multimedia," "information society" or "virtual reality," "innovation system" can be defined more widely or limitedly to suit current interests or the context at hand.

The more limited definition of innovation system consists of not much more than the institutions and actors of research and development activities. The wide definition requires that the connections between the innovation system and labour market issues, financial institutions, fiscal and trade politics, etc. are analyzed. The limited approach may be too restricting and the wide approach might be just too

wide to be useful in research that aims to influence the science or technology policies. (Lemola 2000, 168–169)

The newest addition to the line of key concepts in the discourse on innovation, technology, and regional development is the term "innovation environment." The viewpoint of research on innovation environments tends to be wider than in research on innovation systems. The build-up of an innovation environment is affected by regional history and culture, organization models, and behavioural models created over time. In other words, mental aspects are also important. Recent innovation research and related theorization is described by Hautamäki (2007, 121–122; translation and italics ours):

> *The most interesting new standpoints are the various network theories, Richard Florida's theory about the creative class, and the theory of innovation ecosystems that follows the model of biology. These all emphasize gradual development that is based on earlier strengths. Whereas traditional innovation policies have a spirit of guidance and enabling (top down model), the new standpoints underline the importance of the activity and self-guidance on the bottom level (bottom up model). Good examples of the top down model are the focus points of R&D funding – which are, of course, understandable where resources are scarce.*

What do we understand with ecosystems? It is advisable to discuss the semantic dimensions of such a biological metaphor. As we all know, continuous competition takes place between different species and between the individual animals of a single species (cf. the references to Darwin above). Changes in the environment are reflected in the food chain, the biological processes, and the population.

In the same way, each actor and service of an innovation economy or digital ecosystem has to find its own "ecological category" in order to survive the struggle for existence that takes place on the market. Only in afterthought will we be ready to assess and analyze the effect the current change and turbulence have had on the long-term structures.

The tension between the "free market" and the controlling and supporting functions of public structures, institutions, legislature, etc. are relevantly related to this issue. In the American framework, these problems fall back on the classic political differences between the democrats and the republicans. In Europe, the sometimes heated debate has been conducted around such themes as welfare state, privatization, neo- and market liberalism, etc.

Just as clusters, ecosystemic thinking can be applied when taking a look at regional innovation processes or structures. Silicon Valley is often mentioned as an example of a successful, market-oriented, and future-oriented ecosystem or of a community that refines and enriches ideas towards potential innovations. The success of the region as the prominent technological expertise centre and as the R&D diamond of the world has been explained with favourable conditions, positive and entrepreneur-oriented atmosphere, and with the tradition of success. Professor Hautamäki refers to Homa Bahrami and Stuart Evans (2000) and sums up the views of innovation research about the success of northern California (translation ours):

> *The concept of the ecosystem of innovations has proven to be a fruitful tool to shape a general picture of the innovation activities of a region. It has been used to depict the dynamic*

> *business environment of Silicon Valley. In the same vein as in nature, the growth and success of Silicon Valley can be […] explained by the ever-shaping whole, which is built out of differing, independent, and interconnected entities that feed and support each other. […] The ecosystem of the Silicon Valley is best described by five basic factors: universities and research institutes, venture capitalists, specialized business services, the global pool of talent and entrepreneurs, and the business-oriented culture. (Hautamäki 2007, 129 –130)*

Finally – *summa summarum*: It is important for the development of innovation media and innovation journalism to understand the key concepts and approaches. We can see that they function as a natural part of economic clusters and innovation ecosystems. It is challenging but necessary to understand the functional logic of these (media) environments.

Important issues related to operational contexts and innovation activities have been discussed before. A conceptual analysis was started in this study and it should be continued also with a more specific focus on "innovation journalism" and "innovation media." It is also worth noticing that these concepts have appeared into the discussion at the same time as the debate on the "creative class." This is an interesting observation: innovation journalism and innovation media can be linked with the rise of the creative economy, creative industries, and the "creative class."

PART TWO

INNOVATION ECOSYSTEMS AND INNOVATION ACTIVITIES IN ORGANIZATIONS

1. INNOVATION IN AN ORGANIZATION OR IN AN INTER-ORGANIZATIONAL NETWORK?

Innovation policies can be classified as demand-side oriented or supply-side oriented. Accordingly, theories about innovation processes can be classified as *linear* or *systems-oriented*.

The linear views of innovation processes support the supply side orientation in innovation policies. On the other hand, systems perspectives on innovation can yield a much more fruitful and interesting perspective on the demand side, in terms of both theoretical and policy relevance.

The linear model of innovation has been generally accepted throughout much of the period since the World War II. In a nutshell, a linear view of the innovation process means that "science leads to technology and technology satisfies market needs" (Gibbons et al. 1994, 51). This model includes an idea that there is no feedback from later stages of the innovation process (marketing, consumer experience, production, product development, etc.). Because of the lack of feedback mechanisms and "market failure," the government's role in the linear model is to provide direct and indirect subsidies for industrial R&D agencies.

The linear view is very simplistic and also unrealistic. In praxis, this theoretical view is not too helpful. For example, the linear model does not indicate the amount of government intervention required, the particular fields in which a policy intervention is required, or the type of intervention required. Fresh innovation theories state that feedback and trials are essential in innovation processes. In addition, shortcomings and failures are parts of the learning process creating innovations (Kline & Rosenberg 1986, 286).

Another problem in the linear view is that scientific basic research does not always lead to innovations. Technical and social innovations may also proceed independently, with no interaction with science, although other types of interactions might be important. A so called *chain-linked model of innovation* has gained much support in recent innovation studies (ibid., 289). Recently, Prahalad and Krishnan (2008) reveal that the key to value creation and future growth of every business depend on having access to global resource networks that co-create unique experiences with customers.

The more systemic view of the innovation process recognizes the potentially complex interdependencies between the elements of the innovation process. The chain-linked model makes it evident that the systems-oriented approach accords great importance to the demand side. It has been shown that many users – both individuals and firms – develop new products and services to serve their own needs.

The so-called customer-driven innovation process is increasingly relevant for many companies. Technological progress has made this kind of innovation model easier and more feasible for larger segments of population. *User-innovators* and *open innovation models* will probably change the logic of innovation systems in the future (cf. von Hippel 2005; Baldwin & Hienerth & Hippel 2006). As stated above, open innovation is a new paradigm for managing research, technology, R&D, and business. Many companies have opened their innovation processes and successfully utilise open innovation strategies. (Chesbrough & Vanhaverbeke & West 2008)

Thus, studies on the demand side and consumer market in relation to the innovation processes matter a lot. There are many systemic chains in innovation processes. The systemic chains are relevant to organizations and networks —especially from the demand-side perspective.

It can be noted that innovation ecosystems consist of two basic organizational elements: *organizations* and *networks of organizations*. This section provides some interesting viewpoints to innovation ecosystem analysis. The most important of these concepts is the strategic concept of innovation quality, which forms a real competitiveness challenge for innovation-driven companies.

The importance of innovation on competitiveness is recognized. As we know, innovation is an idea or a model to improve a product, equipment, process, or a system. Innovation, in the economic sense, only occurs after the first commercial transaction has taken place (cf. Freeman 1982). International competitiveness and macroeconomic performance are functions of innovation-based commerce and long-term innovation abilities (Dosi 1982).

Different innovations may require quite different organizational efforts and may result in a multitude of competitive impacts. From this perspective, innovation types can be categorized into two classes: *incremental* and *disruptive innovations*. Incremental innovations utilize current technology in the market to strengthen existing competencies. This type of innovation generates value by accumulative effect and by creating versatility (Abernathy & Clark 1985). Disruptive innovations frequently begin in limited markets, but, after technological improvements, they substitute current technologies and simplify the product and the value proposition (Christensen et al. 2004).

In spite of broad research efforts, there is no consensus about what enables an organization to innovate. The development of innovation theory has, over the past decades, gone through a major reformation. Innovation is no longer primarily seen as a process of *discovery* but rather as a non-linear process of *learning*. Economists Richard Nelson and Sidney Winter proposed in *An Evolutionary Theory of Economic Change* (1982; see also 2002) that innovation is shaped by crisis-driven search programmes by companies. These search programmes are experimental learning processes. The major theme in innovation research has subsequently been exploration of the nature and characteristics of such learning across companies, sectors, regions, and national innovation systems.

The role of innovation networks is also presented in this kind of learning environment context. Especially small companies are able to gain access to sophisticated technology and technical experience, whose direct employment is precluded by internal resource limitations. In this way, innovation is considered a process of *learning by interacting* (Lundvall 1992, 1995), distinct from the *learning by doing* (Arrow 1962) and *learning by using* (Rosenberg 1982). It can be concluded that innovation has both organizational and inter-organizational aspects.

Many scholars have noted that organizational in-house capacity is more important for innovations than inter-organizational networks (Dosi 1982; Nelson 2000). In small companies, especially, developmental rather than fundamental research focus matters (Santarelli & Sterlacchini 1990). In this sense, the learning capacity of organizations is an important factor of success in innovation activities. Innovative activity is largely incremental (Lundvall 1995), it is built on current capabilities and on prior experiences, and it involves some tacit knowledge.

2. INNOVATION NETWORKS

Many studies emphasize opposite aspects. M. H. Best (1990), for example, has noted that new models of global competition rely on the innovative performance of inter-organizatorial networks. He presented Emilia-Romagna region as a good international example of innovation activity based on them. In the 1980, industrial economy theories influenced innovation research, which theorized that structural factors determined the innovation activities in a company (Porter 1983). These studies found that the ability to *establish relationships in a network of organizations* was a key issue in developing a company's organizational innovation capacity.

Another strong argument for innovation networks came from the successful performance of Japanese companies. In the 1980s, Nissan, Toyota, and Mitsubishi built many strategic alliances with other organizations. The alliance members significantly improved their learning abilities through the interaction with each other. Rycroft and Kash (2004) defined "networks" as the linkages between organizations (other companies, universities, and regulatory agencies) that create, capture, and integrate many different skills and knowledge needed to develop complex technologies and bring them into the market.

The Confederation of British Industry conducted a famous research on the best innovation practices of British companies and found that innovative enterprises seek collaboration with other companies and universities in order to maximize their knowledge and minimize their risks along the innovation process (cf. Neely et al. 2001). This research finding already recognized the basic reason for open innovation activities among companies.

One fundamental research question in innovation studies is: How innovation networks operate in reality? Nowadays, there are two perspectives for empirical studies: (1) Analysis of the relationship structures inside an innovation network and (2) analysis of the dynamic and system behaviour of a network along the innovation process. These innovation studies have found that direct and indirect relationships are important in innovation processes. Ahuja (2000) found that direct relationships play a different role in the innovation process than indirect relationships do. A direct relationship is the access one organization has into another organization without the intermediation of a third part.

Indirect relationships occur when an organization obtains access to many other organizations through the intermediation of the third organization. Ahuja (ibid.) has demonstrated that direct relationships are suitable for resource and knowledge interchange, while indirect relationships are suitable for quick access to specific information.

Another interesting research has been performed by Pyka and Küppers (2002). They have developed a dynamic and systemic model to analyze the behaviour of innovation networks throughout the innovation phases. They established five factors of an innovation network: (1) the company's own R&D effort, (2) the innovation partnerships and alliances, (3) the resulting knowledge base, (4) the resulting innovation, and (5) the market acceptance for the innovation.

3. A BUSINESS MODEL IN AN INNOVATION PROCESS

Today, the concept of business model is frequently utilized in the context of innovation studies – and often ambiguously. Business model is "a statement of how firm will make money and sustain its profit stream over time "(Stewart & Zhao 2000). Another definition is provided by Morris's research team, for whom "a business model is a concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture and economics are addressed to create sustainable competitive advantage in defined markets "(Morris et al. 2005). They have proposed the following questions to define a business model:

(a) how does the company create value?
(b) for whom does the company create value?
(c) what is the company's internal source of advantage?
(d) how does the company position itself on the marketplace?
(e) how will the company make money?
(f) what are the entrepreneur's time, scope, and size ambitions?

This framework identifies how a firm creates unique combinations from basic components in a specific manner. The framework also describes the guiding principles defined by a set of operating rules to ensure that this unique combination will be implemented in a specific market place.

Chesbrough and Rosenbaum (2002) have analyzed 35 case studies and found that a business model is composed of (1) value proposition, (2) target markets, (3) internal value chain structure, (4) cost structure and profit model, (5) value network, and (6) competitive strategy.

Linder and Cantrell (2000) interviewed 70 CEOs and analysts and concluded that a business model derives from variables such as (1) pricing and revenue model, (2) channel and commerce relationship, (3) organizational form, and (4) value proposition. Business model is in a way a kit between independent variables and dependent variables of a company (see Figure 6).

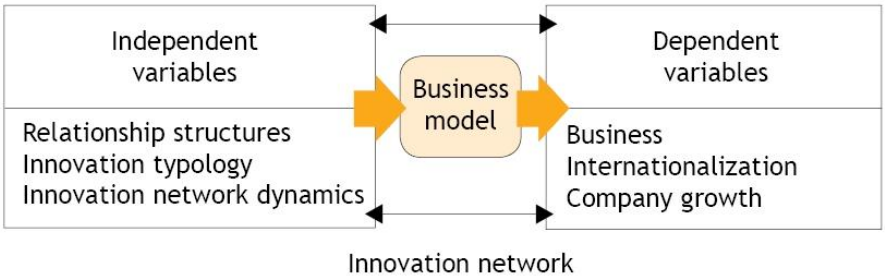

Figure 6. Innovation network and business model (Calia et al. 2007, 428).

To sum up, innovation network structure typically includes direct relationships and intermediated indirect relationships. These relationships have many impacts on a business model.

4. INNOVATION QUALITY

There are many innovations in the world. Some are good and some are not so good. In the recent discussion, more and more attention is paid to innovation quality. With respect to products and services, innovation quality is defined through variables like (1) amount, (2) performance, (3) effectiveness, (4) features, (5) reliability, (6) timing, (7) costs, (8) value to the customer, (9) innovation degree, (10) complexity, and (11) other variables.

Typically, innovation means some kind of a quality change in products and services, and the concept of innovation has strong links to newness, creativity, and unconventionality. The concept of quality has strong links to standardization which is, in turn, characterised by systematic procedures and low tolerance. Can the total quality management approach be applied to innovations? How to analyze innovation quality? Haner (2002, 34) has proposed that innovation quality has three domains: (1) product/service, (2) process, and (3) enterprise (see Figure 7).

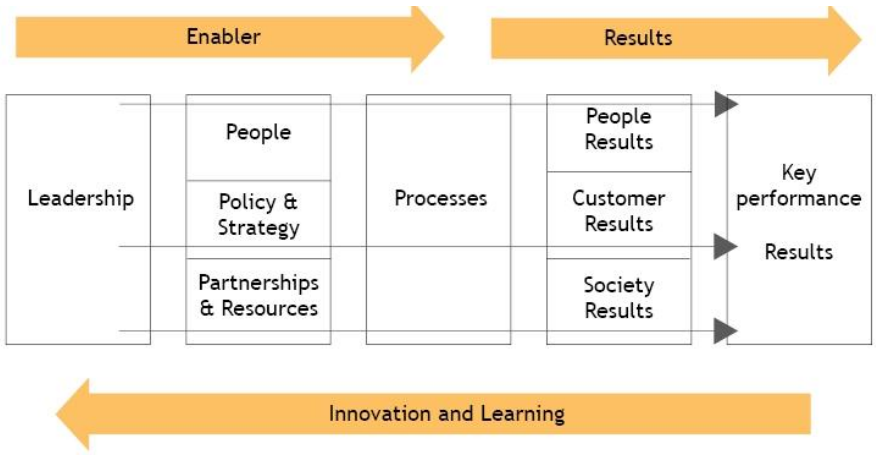

Figure 7. Quality management (Haner 2002, 34).

European Foundation for Quality Management (cf. EFQM 2009) has developed this basic quality management model for many years. Figure 7 depicts the EFQM framework for quality management. Quality and excellence are created through comprehensive management of interdependent and interrelated systems and processes. Excellence means quality exceeding the average and the adequate level.

This kind of a broad approach leads us to identify four domains of innovation management (Bullinger 1994). The time span of innovation management is different in different domains.

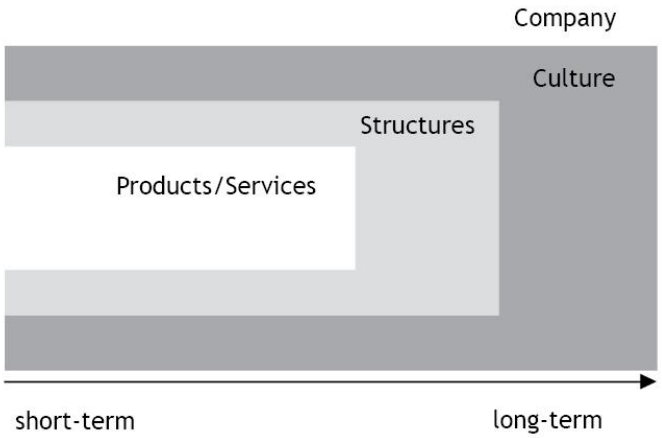

Figure 8. Domains of innovation management (Bullinger 1994).

Innovation management is about transforming an initial impulse for improvement into a market success via idea generation, screening, evaluation, and implementation. Different types of innovation (incremental or radical) require different amounts of time before they can be implemented (Figure 8).

As proposed by Haner (2002, 34–35), innovation quality must be assessed in three domains: (1) product/service level, (2) process level, and (3) the enterprise level. Potential measures for the individual domains are (cf. Ahmed & Zairi 2000):

A. Product/service-related measures
   - value added to the customer
   - costs against targets
   - stability of design
   - product return on investment
   - product performance level, etc.

B. Process-related measures:
   - time to market
   - efficiency and productivity improvement
   - staffing level effectiveness in product development
   - project management effectiveness
   - flexibility increase, etc.

C. Enterprise-related measures
   - acceptance rate throughout the workforce
   - understanding customer needs
   - turnover generated with innovative products
   - patent ratio
   - rate of successful innovation attempts, etc.

Innovation quality measurements provide a management tool for leaders and managers in a company. There are various outcomes of innovation quality. The best companies have strong product/service innovation quality (IQ), strong process IQ and strong enterprise IQ. Typically, companies have problems in some domains. Only in exceptional cases all the domains are strong (Haner 2002, 33–36).

To sum up the essential insights of this section, the concept of IQ is an effective tool to assess the quality of innovation activities. Identifying specific patterns of innovation quality aims to increase awareness regarding innovation activities within organizations.

If "innoflation" is considered a problem, effective monitoring systems of innovation quality must be developed. It can also be noted that contemporary innovation networks increasingly work on business model reconfiguration instead of the traditional technological development. Without a proper business model, innovations will fail or, at least, will not reach their full potential. Innovation networks can provide the resources needed to change the business model in order to achieve global competitiveness.

PART THREE

FORESIGHT AND INNOVATION DYNAMICS

1. EFFECTIVE FORESIGHT SYSTEMS

A requirement for a foresight process is efficiency. Typical actions following a foresight process are the re-examination of current plans or a radical reform of all plans of the organization. A foresight process consists of appreciation, learning, and anticipation. Foresight is intensely dependent on pattern recognition. A foresight activity, composed of patterns of inter-linkage between elements, provokes and is provoked by the recognition of a new situation. New ideas or new objects do not arise from a vacuum (Loveridge 2009, 23–24).

Typically, people become aware of their perceptions or misperceptions during a foresight activity. This suggests that foresight can and does have an impact on decision-making. From this perspective, a main criterion of effectiveness is that foresight should lead to a reconsideration and modification of actual strategies or policies because the perception and the expectations of actors in respect to future developments have changed. There are also other criteria for the effectiveness of a foresight activity. Better understanding of future challenges and pathways or the formulation of alternative decision options are more or less ancillary arguments. The important effect ("litmus test") is *the actual impact on decision-making*, either in the short- or the long-term (Eriksson & Weber 2008, 463; Brummer 2005).

As proposed in the previous section, innovation networks increasingly work on *business model reconfiguration* instead of the traditional technological development activities. Without a proper business model, innovations will fail or the results do not meet their full potential. This is one logical reason for foresight experts to suggest that foresight activities should combine (1) the use of foresight methods, (2) innovation network analysis, and (3) actual strategic decision needs.

In order to have an impact on decision-making, it is necessary to create *an explicit link between foresight and decision-making*. Today, decision-making in relation to innovation and new technologies is confronted with the need to navigate increasingly complex decision landscapes. This complexity is due to the increasingly interactive and multi-actor nature of innovation processes. This all makes anticipation of future developments and their consequences increasingly difficult.

To be perceived as useful and effective, forward-looking exercises must enable decision-makers to understand and cope with this interactive, complex, and inherently uncertain character of innovation processes and systems. Second challenge for decision-makers is that they should contribute to the mobilization and coordination of decision-making by other actors. Third key challenge is that decision-makers must be able to deliver insights on possible strategies and options for individual actors on how to "change course." In this process, they must be able to "think out of the box." (Eriksson & Weber 2008, 463).

Conventional forecasting approaches (with the aim of predicting the future) were based on a linear understanding (or a railway scenario approach) of processes of socio-technical change. Such approaches are simply inappropriate representations of reality and thus misleading rather than enlightening. Still, the dominant model of foresight pursues a more modest level of aspiration than simple forecasting. It strongly stresses the "collective vision" or "collective ability to shape the future."

This model tends to underestimate the limitations of decision-making regarding the interactive and globalised innovation processes. In reality, to be able to shape the future, actors need to be able to adjust to external developments and other agents 'strategies and make sure they focus their own actions on their highest priorities. Simply put, actors need to be *agile, not relying just on their own priorities, visions, and strategies*.

2. AGILITY, FORESIGHT, AND INNOVATION SYSTEMS MEETING THE FITNESS LANDSCAPE CHALLENGE

In foresight, some useful methods have been created to develop the agility of organizations and individual actors. Such foresight methods include *Weak Signal Analysis* (Ansoff 1982, 1984, 1985; Harris & Zeisler 2002; Ilmola & Kuusi 2006; Mendonça et al. 2004), *Wild Card Analysis* (Petersen 1999), *Diamond Shaped Trend Model* (DSTM) (Veljgaard 2008), *Actor-Network Theory*, and associated innovation network analyses (Law & Hassard 1999). The use of these foresight methods helps decision-makers understand what kind of new challenges are emerging and which changes can destroy our current business models and value creation systems (cf. El Sawy 1985).

It should also be noted that weak signal analyses are relevant where innovations are concerned. Weak signal analyses can help identifying so-called "black swans." Often new innovations are highly improbable outliers of mainstream issues, thus black swans. For example, the astonishing success of Google was a black swan (Taleb 2007).

Figure 9 shows four different types of innovation. Weak signals can be associated with new and existing markets. Innovations can be incremental or radical. One important aspect of innovation related to weak signals is that, in the long run, A, B and D type innovations turn into C type innovations. When an innovation has changed into a C type innovation, it is not a weak signal or a sign of change but probably a trend in a market. The most powerful seeds of change are potentially in new markets where radical innovations occur. In addition, radical innovations in existing markets can create strong seeds of change. Less powerful changes are probably created by incremental innovations in new markets. (von Stamm 2003, 47).

Figure 9 carries an important message for contemporary organisations. Unless an organisation ensures its new products and services fall into the far three quadrants, over time all its products and services will end up in the bottom left corner. Organisations need to analyse the weak signals of their business environment and markets in order to avoid falling into a situation where their innovation strategy fails to advance the company's cause.

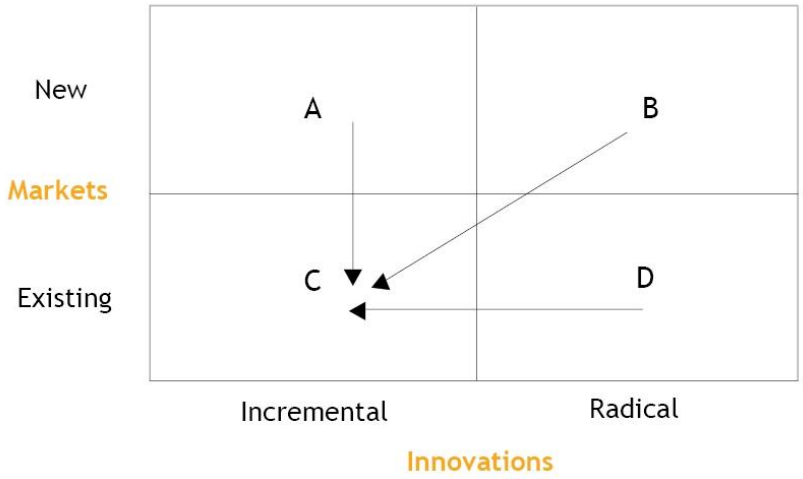

Figure 9. Innovation categories (von Stamm 2003, 47).

Recent developments in research regarding the social processes of trends are interesting. An important contribution in this field is the *Diamond-Shaped Trend Model* (DST Model), which describes the basic anatomy of a trend. This model consists of eight different personality profiles: trend creators, trendsetters, trend followers, early mainstreamers, mainstreamers, late mainstreamers, conservatives, and anti-innovators.

These profiles are also called trend groups. The term *trend group* stresses that all people are part of the trend process. The DST model can, in principle, represent the entire population. It is especially important to understand that trendsetters play an important social role in identifying weak signals and novelties in markets and society and then support them. Some trendsetters always adopt new products and ideas and understand the meaning of weak signals.

The DST model indicates that there are always social differences in the weak signal identification and adoption processes. It further shows that some social groups will never take some weak signals seriously and adopt them. This group forms the *anti-innovators*. The DST model, presented in Figure 10, also includes the idea that weak signals are created by people, by trend creators (Vejlgaard 2008).

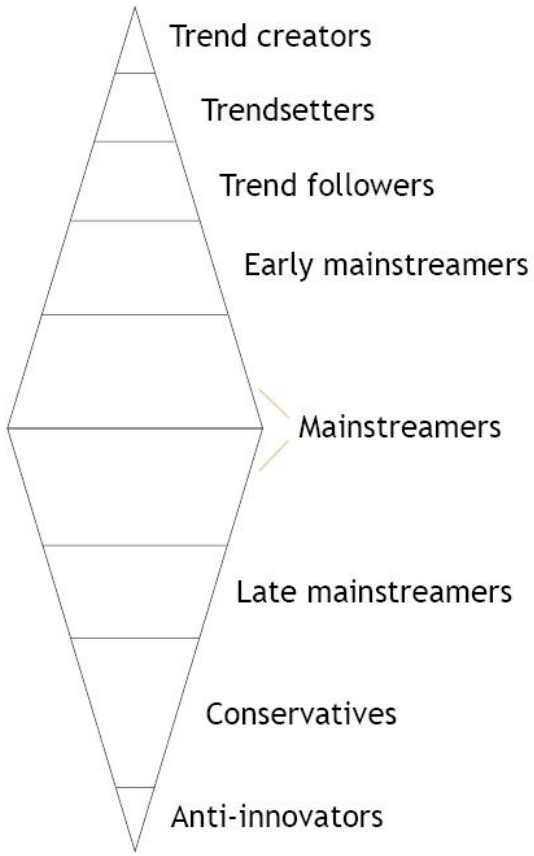

Figure 10. The Diamond-Shaped Trend Model (Vejlgaard 2008, 64).

Group psychology plays an important role in social change and in the adoption process of new innovations. People have different attitudes towards social and cultural change. For example, being a trendsetter can be explained by someone having a certain psychological profile. These profiles are not discussed in any more detail in this publication, but it should be recognised that they are an important issue in the anatomy of a trend. Trendsetters are the most important social group and this group typically consists of young people, designers, artists, wealthy people, celebrities, gay men, and other style-conscious sub-cultures.

Vejlgaard (2008, 75–78) has estimated that the six largest trend groups can be broken down into the following percentages:

- Trendsetters: 5 %
- Trend followers: 10 %
- Early mainstreamers: 20 %
- Mainstreamers: 40 %
- Late mainstreamers: 15 %
- Conservatives: 10 %

Many publications deal with the diffusion of innovation (see e.g. Rogers 1995). The DST model can also be considered as a diffusion process of innovation and can be integrated into the *Actor-Network*

Theory (ANT). This approach underlines the importance of networks in the larger scale of weak signal diffusion and adaptation processes (Debackere & Rappa 1994; Bogner & Barr 2000).

From ANT comes the idea that the "success "of any innovation is actually a paradox. This is because the success depends on (1) many actors other than its pioneers, (2) their expectations, (3) their interests, and (4) the problems facing them. Typically, the translation process of an innovation underlines the existence of a cluster of links that bind the innovation with all those who use it.

Early pioneers must recruit allies to participate in the production of the innovation but they also have to control the allies 'acts and gestures in order to make their actions foreseeable. The ANT approach is nowadays seen as a useful tool for analysing actor networks in strategic niche management. (Law & Hassard 1999; Caniëls & Romijn 2008)

In Figure 11, four basic types of social change related to technological and social innovations are determined. It presents a way of looking at the impact of a social change and whether the speed of that change will create an evolution or a revolution. Certain types of social change are extremely important for technological forecasting.

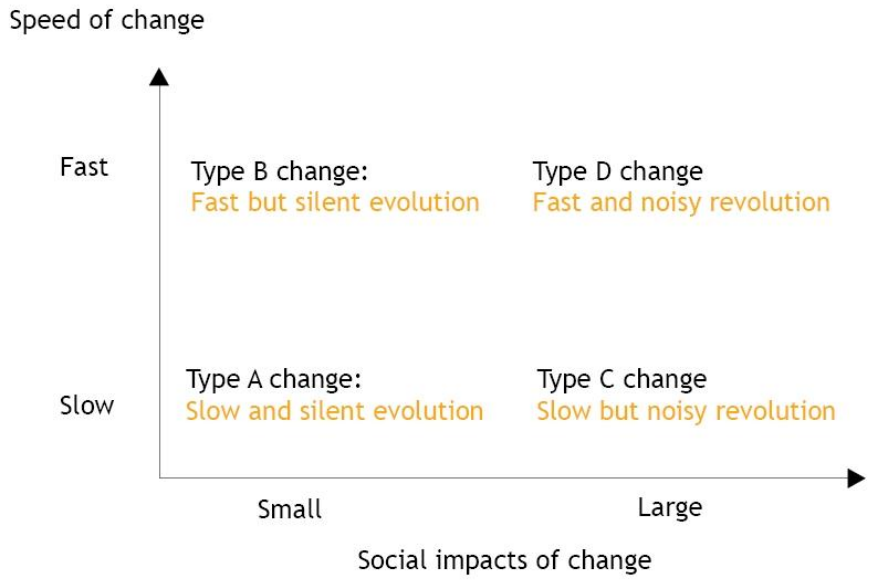

Figure 11. Types of social changes.

It can be concluded that human history is basically an interaction process between seeds of change. Technological innovations always produce seeds of change and new agility needs. Today, technological innovation is increasingly concerned with complex products, services, and processes. These technologies are innovated by self-organising actor-networks.

Networks are here defined as linked organisations that create, acquire, and integrate the diverse knowledge and skills required to innovate complex technologies. This is a key issue as companies face the modern business challenge of coping with speed and complexity. In Figure 11, this challenge and its true meaning for modern companies and other types of agencies can be seen. Strategically *agile companies* are companies able to cope with the fast pace of change and new systemic complexities. These companies are usually experts at identifying seeds of change (Doz & Kosonen 2008, xii –xiii).

It can be expected that seeds of change will affect corporate structures. In the future, the role of strategically agile companies and operation-driven companies will probably become more important. Simultaneously, in this social process, the influence of conventional strategic planning will decrease. This process should increase the demand for better and more flexible analyses of seeds of change.

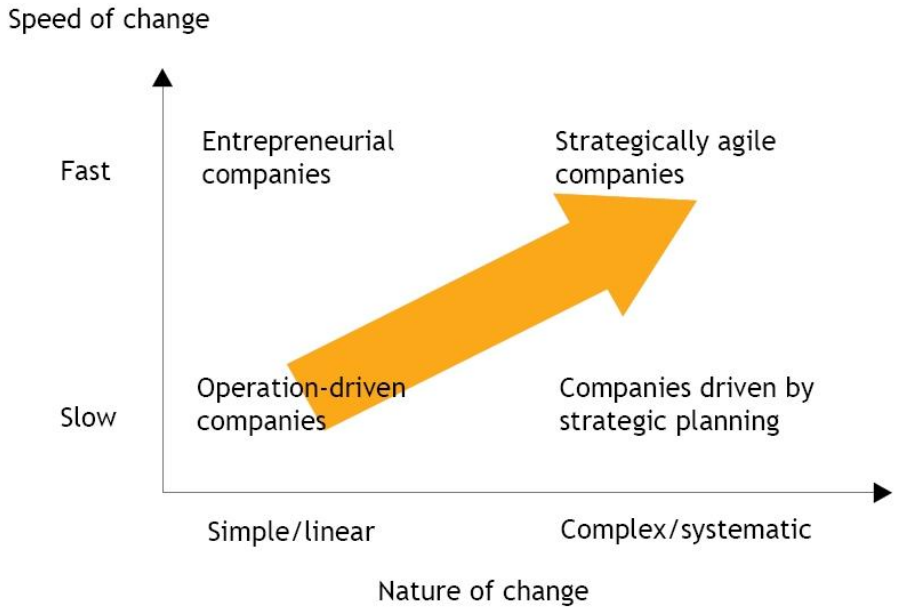

Figure 12. Speed of change, nature of change, and modern companies (Doz & Kosonen 2008, xiii).

Companies face very complex and emergent systemic strategic situations. They also face rapidly developing situations, where winners and losers can be recognised very early –without anyone even noticing any signals or seeds of change (ibid., xiii).

One important new approach is the *fitness landscape approach*. It treats the organisational system and its decisional situation as a complex adaptive system that continually co-evolves with its environment –searching for solutions and making decisions. Although this theory has biological origins, it has been applied to various fields including economic and organisational studies. (Frenken 2006).

The fitness landscape approach is closely related to *pattern management* and *complex system analyses*. It includes the fundamental idea that there are many simultaneous weak signals, which constitute patterns together. Weak signals, white noise, and identified trends form a common unified reality. In evolutionary economics, fitness landscape models have been used to simulate the design of complex technological systems as a trial-and-error process towards local optima. One key question has been the development of organisations 'fitness landscapes so that they become flexible and agile enough to survive different kinds of weak signals and weak signal patterns (Ilmola & Kuusi 2006). The agility of strategic processes has been seen as a new fundamental challenge for corporations and companies (Doz & Kosonen 2008).

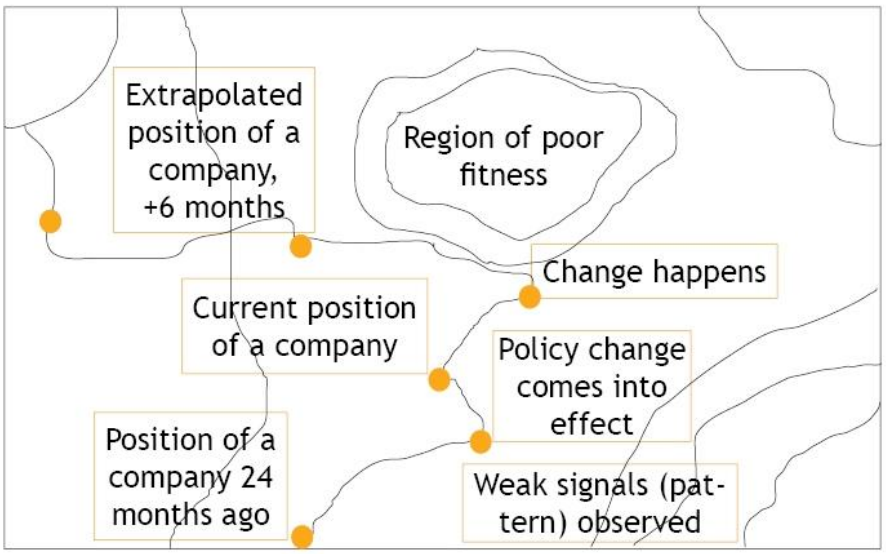

Figure 13. An example of the fitness landscape approach: Viewing a company's weight time series allows one to plot its speed and direction of movement, and to anticipate problems it will encounter in the future. (Kitts et al. 2001, 37)

Many organisations recognise the fact that the business environment has various levels of unpredictability. In order to cope with such unpredictability, they utilise forecasting and decision modelling techniques at all (visionary, strategic, and operational) levels.

One part of *organisational agility* is the identification and adoption of various weak signal agents seen in markets and in innovation networks. The emergence of various weak signals related to each other (a weak signal pattern) typically creates coordination problems. They do not arise only when multiple companies aim to improve a complex product design.

In the same vein, coordination is required with respect to process innovation aimed at reducing the costs of production. Again, the interdependencies among elements in a complex product design generally involve interdependencies in the production system that is used to produce elements and assemble them into product lines. Changes in a particular stage of production require the adaptation of related stages of production. In this kind of industrial context, the relevancy of weak signal analyses, fitness landscapes, and the agility of organisations matter much more than in the past, where there was less complexity in organisational and industrial structures. (Kitts et al. 2001; Frenken 2006).

In a changing environment, it is still important to ask the right questions. Three key questions are:

(1) Who is going to be your customer?
(2) What products or services should your company offer to the chosen customer?
(3) How should you offer these products or services cost-efficiently?

This kind of a Strategic Positioning Map is a very useful tool in today's turbulent environment. The final answers a company gives to the *who-what-how questions* are conditioned by what the company thinks its business is and what it is going to be (Roberts 2002, 15).

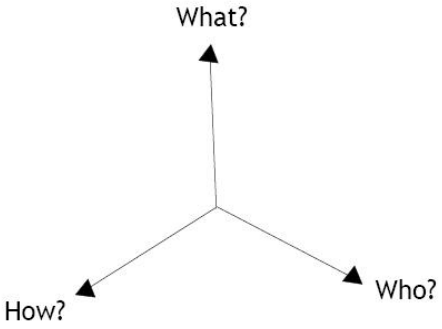

Figure 14. Strategic Positioning Map (Roberts 2002, 15).

Every company makes choices with respect to these questions. The answer to the first question includes the company's *market segmentation decision*. An answer to the second question includes the *integrated demand- and supply-side innovation policy strategy*. The last question is answered through the *existing core competences and comparative advantage* of the company. (Roberts 2002, 17)

Companies able to make *new innovative redefinitions* to the key questions are likely to be more innovative than companies who answer these questions conventionally.

CONCLUSIONS

The beginning of this publication discussed the concepts, aspects, and future trends of creative processes and innovation ecosystems. Such issues as synergy, network building, and "positive accidents" (*serendipity*) were in focus. Next, the innovation networks, various business models, and innovation quality were discussed. Finally, the study concentrated on effective foresight systems and processes, strategic agility, and the fitness landscape model.

To sum up, this publication calls for a deeper conceptual analysis of innovation discourse and the visionary rhetoric related to it. The threat of "innoflation" was also discussed. Real innovations and structural changes are needed instead of unrealistic rhetoric and hype (cf. Inkinen 1999b). The ability to make new redefinitions is a key competence for innovative organizations. We strongly believe that a wider perspective and deeper understanding is needed in order to develop critical, high-quality research. Too often the use of key concepts remains vague and imprecise even in academic debate on innovation policy.

This publication discussed theoretical and practical aspects of innovation dynamics and related topics. It is worth to mention that also *media practices* and *innovation journalism* (cf. Kauhanen 2007; Kaivo-oja 2007; Inkinen & Kaivo-oja 2009) can be considered as key elements of innovation ecosystems. In the ecosystemic view, the role of media and communications (both the traditional mass media and the new Internet-based services) is evident. The traditional *triple helix* model can/should be conceptually expanded and considered in a larger intellectual framework. The development of *national open innovation systems* is an emerging challenge (Santonen & Kaivo-oja & Suomala 2007).

The connections, contacts, and communications between the industries and experts of different fields are highly important in innovation processes. It is of great importance to create, support, and promote contexts and environments where creative processes and serendipity can take place. Recently, growing attention has been devoted to the concept of *open innovation* both in the academia and in business life. Henry Chesbrough (2003) describes how companies have shifted from so-called closed innovation processes towards a more open way of innovating.

Open innovation is the new paradigm for managing research, technology, R&D, and business activities. As a fresh and challenging approach, open innovation can also have broad applicability in various industries – also in media. Its influence may be direct and/or indirect. Open innovation includes, for example,

(1) promoting the generation and contribution of external knowledge creation and innovativeness
(2) incorporating external sources into (media) companies' resources and capabilities
(3) maximizing the exploitation of diverse intellectual property (IP) resources.

For innovation dynamics, the open innovation paradigm means increasing need for deep cooperation with different experts and specialists from other networks and organizations. For (media) companies and professionals, the open innovation paradigm additionally means that they really make

good use of their own R&D capabilities to generate innovations to be commercialized. In addition, they should identify potential IP located beyond the boundaries of the company. Spin-offs, licensable patent portfolios and knowledge spillovers have become key words in the present innovation terminology.

Innovation models and systems provide a useful view on the complex world of innovations and creative processes. However, we should not forget that innovations and creativity are human characteristics – the individual, social networks, and interaction form the core of all creativity. It is symptomatic that the terms *homo creativus* and *homo ludens* have been used in the contemporary debate. We have understood that the human is not merely a *homo economicus* of economic rationality nor the engineering blacksmith of *homo faber,* but also the playful, creative human of *homo ludens* and *homo creativus.* (cf. Inkinen 2006; Kakko & Inkinen 2009)

It seems clear that the innovators, experts, and knowledge workers of the "creative economy" possess loads of human capital and seek various kinds of experiences to develop their minds, methods, models of action, and technological toolkits. Such people are characterized by the *ethos of creativity* and by multicultural competence(s). The role of strategic foresight is increasing in innovation processes and ecosystems. Foresight can help to find novel innovation possibilities or to commercialise ideas and inventions (Kaivo-oja 2006; Kaivo-oja & Marttinen 2008).

In addition, we might add that the futures are not found only through observations (trends, scenarios, weak signals) but they are also an outcome of discovery and imagination. In the words of Nobel Laureate in Physics, Dennis Gabor (1964, 161):

> *The future cannot be predicted, but futures can be invented. It was man's ability to invent which has made human society what it is. The mental processes of invention are still mysterious. They are rational, but not logical, that is to say not deductive. The first step of the technological or social inventor is to visualize, by an act of imagination, a thing or a state of things which does not yet exist, and which to him appears in some way desirable. He can then start rationally arguing backwards from the invention, and forward from the means at his disposal, until a way is found from one to the other. There is no invention if the goal is not attainable by known means, but this cannot be known beforehand. The goal of the technological inventor is attainable if it is physically feasible, but for the realization he will be dependent, just like the social inventor, on human consent.*

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