

The Next Big Thing?

Trends Shaping Nordic Innovation

*Jørn Bang Andersen, Senior adviser innovation
Nordic Innovation Center, Nordic Council of Ministers*

&

*Patrick Crehan, Ph.D,
CEO Crehan, Kusano & Associates*

The Next Big Thing?

Trends Shaping Nordic Innovation

TemaNord 2009:546

© Nordic Council of Ministers, Copenhagen 2009

ISBN 978-92-893-1883-9

Print: Scanprint a/s, Århus

Copies: 500

The process and work of the publication under Iceland's chairmanship was supported and managed by Nordic Innovation Center.

Printed on environmentally friendly paper

This publication can be ordered on www.norden.org/order.

Other Nordic publications are available at www.norden.org/publications

Printed in Denmark



Nordic Council of Ministers

Store Strandstræde 18
DK-1255 Copenhagen K
Phone (+45) 3396 0200
Fax (+45) 3396 0202

Nordic Council

Store Strandstræde 18
DK-1255 Copenhagen K
Phone (+45) 3396 0400
Fax (+45) 3311 1870

www.norden.org

Nordic co-operation

Nordic cooperation is one of the world's most extensive forms of regional collaboration, involving Denmark, Finland, Iceland, Norway, Sweden, and three autonomous areas: the Faroe Islands, Greenland, and Åland.

Nordic cooperation has firm traditions in politics, the economy, and culture. It plays an important role in European and international collaboration, and aims at creating a strong Nordic community in a strong Europe.

Nordic cooperation seeks to safeguard Nordic and regional interests and principles in the global community. Common Nordic values help the region solidify its position as one of the world's most innovative and competitive.

Content

| | |
|--|-----|
| Preface..... | 7 |
| Summary | 9 |
| Future Global Trends..... | 13 |
| New and Emerging Models of Globalisation | 19 |
| Leverage of Innovation Hot-Spots | 27 |
| Services and Innovation | 35 |
| Supporting Open Innovation | 45 |
| Innovation Indicators..... | 49 |
| The Value Chain as the Innovation System..... | 55 |
| Encouraging Entrepreneurship | 65 |
| Conclusions | 73 |
| Special Focus: Climate Change – Impacts for Nordic Industry, Technology, and Innovation | 77 |
| The challenge and what is at stake | 78 |
| Climate and energy | 81 |
| The role of cities | 87 |
| Land-use, food, agriculture and forestry | 92 |
| Water, fisheries and the marine environment..... | 94 |
| Other sectors | 95 |
| The specific challenge of climate-related innovation..... | 100 |
| References..... | 109 |
| References related to the “Climate” chapter, in chronological order | 110 |
| Icelandic Summary..... | 113 |
| Samantekt..... | 113 |
| Sammanfattning | 119 |

Future Global Trends



The Nordic economic block constitutes one of the world's most innovative and affluent regions. In order to sustain this lead, it is not sufficient for Nordic countries simply to follow trends. They must also set the trends. Many new and arguably pressing issues have arisen in innovation debates around the world during the last few years. These ideas represent a departure from traditional thinking and thus deserve further consideration. NICE could play a role in this context by means of its innovation research and pilot programs. The issues listed below are discussed in more detail in the following chapters:

- The Transition to a Sustainable Economy
- New and Emerging Models of Globalisation
- The Value Chain as the Innovation System
- The Role of Organisation and Management
- Measuring and Managing Innovation
- The Confusion between Research and Innovation
- Leveraging Global Innovation Hot-spots

The Transition to a Sustainable Economy: During most periods of economic history it has never been entirely clear where the next “new idea” will come from or how important such an idea is likely to be. Nordic, European and even global policy trends indicate that issues such as carbon markets, climate change, renewable energy and industrial feedstock, recycling and the efficient use of energy, water and other natural resources, will all assume considerable importance in the years to come. These sectors are essential components of an emerging sustainable economy. This global transition will affect not only existing companies and start-ups, but also the entire value chains to which they belong. This requires innovation at system level and on an unprecedented scale. If change is to be achieved on a sufficiently large scale to meet national and international energy, climate and security goals, policies may need to focus more on issues such as the sourcing and adoption of new technologies. .

New and Emerging Models of Globalisation: Perhaps the most established model of globalisation is that based on access to external natural resources. This gave way to a model based on access to external markets. A more recent model is based on access to external knowledge. Knowledge, and in particular high-level scientific and technical knowledge, is

obviously a global commodity. The last 10 years has seen a major shift in terms of how large innovative companies meet their research needs. Outsourcing and offshoring, combined with the mediated sourcing of scientific and technical services, are now well established components of this trend. In recent years, two further globalisation models seem to have emerged which may deserve greater attention from policy makers and innovation researchers¹. The first deals with the markets of emerging economies. These may be much more promising than appear at first sight, and pose unique innovation challenges for the companies and entrepreneurs that are interested in the opportunities they provide.

The second deals with a trend towards the global acquisition of external land via lease or outright purchase, by governments, private companies and groups of individual entrepreneurs. This is linked to the export of production systems, as well as management and organisational know-how. In the past, some Nordic countries have had considerable success with this last model, and it could become a promising focus for innovation-related initiatives in the future.

The Value Chain as the Innovation System: For the last 15 or 20 years innovation researchers and policy makers have adopted the habit of analysing innovation systems and of thinking about them from the point of view of the public sector institutions which are intended to support them. Whatever the original motivation for doing this, the approach resembles studying a disease only by examining the doctors that treat it. Innovation is about business. It is “done” by companies. It is a risky, collaborative, iterative, self-correcting activity that spans entire value chains, not individual companies, research labs or university departments.

And yet the innovation research environment seems almost oblivious to this fact. A lot of work has been carried out on developing innovation policies, but relatively little on how innovation actually occurs, and how the practice of innovation evolves. A survey of the literature on innovation gives the distinct impression that the key players are not the companies and their supply chains, but universities and national research institutes. It is true that these institutions have a role to play but such has to be seen in context. Large innovative companies such as IBM or Intel collaborate with between 500 and 1,000 universities and research labs lo-

¹ These are fully addressed in a forthcoming paper by NICe on Global Innovation-Related Trends.

cated in most of the countries of the world. Merck carries out almost 12% of all research in the domains of interest to its business – possibly more than any single country. Companies are responsible for two-thirds of the research carried out in the world and run corporate universities involving up to half a million people. These include their own staff together with those of their supply chain partners and small research teams dispersed among their hundreds of knowledge partners. They organise and manage their own innovation agenda in large, complex dynamic networks. Companies such as Wal-Mart, P&G and Intel play an active role in the development of innovation and entrepreneurship both among their supply chain partners and in collaboration with SMEs operating in their sectors of interest. They promote robust market intelligence and orientation, access to tools and finance, support for marketing and distribution as well as business service brokerage. These companies embody a wide range of models and philosophies for innovation support. Such models have so far received scant attention from innovation researchers. They can teach us a lot about the management and organisation of innovation and should perhaps receive more attention in the future.

The Role of Organisation and Management: Venture capitalists insist that when they invest in a company, they invest primarily in people, and not ideas. They examine the management and the market, together with the possibility of the venture establishing a defensible position in that market. They rarely look for technologies. On the other hand, large or well established companies are always looking for new technologies. The innovation game is different for them. They already have excellent managers, a profound knowledge of markets and their future needs as well as excellent distribution systems.

To them, technology or know-how is just another input variable, and they are always on the lookout for technologies that meet specific needs. The lesson here is that it is management that matters first and foremost. A recent survey of Fortune 500 companies in the US² revealed that only 6% of CEOs thought that their position of excellence as a company was the result of a great idea. Almost all believed that it came from excellence in execution. This boils down to processes, organisation and management. Managers are the ones who make decisions, assign resources and develop human capital. Management matters! Yet, in the past, management and

² Reported by Amar Bhidé in his highly acclaimed book “The Venturesome Economy”.

management innovation has received almost no attention from innovation policy makers and researchers. Perhaps future research and policy interventions should try to fill this gap.

Measuring and Managing Innovation: There is growing dissatisfaction with current approaches to measuring innovation at national level. This is an important issue because measurement is an essential component of modern scientific management. The US, the UK and organisations such as the OECD are all re-evaluating their approach to measuring innovation at national level. The NICE-financed NordTrend project is examining these issues and has recently piloted new approaches based not on the measurement of input variables such as research, but on the profiling of innovation-related company capabilities. The findings are instructive and the project raises many issues linked to possible new approaches to measuring innovation. Some of these may be worth following up as part of future innovation research and pilot projects supported by NICE.

The Confusion between Research and Innovation: There appears to be an increasing need to emphasise that research is not the same as innovation. This is especially true of research in engineering and the natural sciences. Research is one of many input variables to innovation, along with high quality management, distribution and marketing, suitably structured financing, receptive markets, venturesome consumers, work-culture and practices as well as human resource policies. It is possible that innovation policies do not as yet adequately take this into consideration. A recent authority on innovation claims that it is possible to over-invest in research. The reason is that doing so could divert resources from other tasks essential to innovation such as marketing, sales and management. All of these processes require creativity and invention and it is the contributions from highly talented individuals who bring leadership to their roles in marketing and distribution that are essential if the potential created by the knowledge inherent in disciplines related to science, technology and engineering is to be realised. In the Nordic countries we speak of the Norwegian and Swedish paradoxes. To really understand what is going on we need to distinguish properly between research and innovation as activities, and to address research in its proper context. It also means that we need to broaden our outlook in terms of how science can contribute to the overall innovation process. To do so we need to distinguish between “science” and “the scientific method”. Companies such as

IBM are trying to make a science of “service”. Business and management gurus such as Gary Hamel continue to emphasise the role of innovation in management itself, and of research in management involving the investigation of the practice of management using “management laboratories”. Writers such as Christopher Hill believe that we are now moving into a “post-scientific” society where disciplines such as the humanities and the arts will make a more significant contribution than before. Progress will only be made if we first of all understand what innovation really is and remove the prevailing confusion with research. The NICE financed InnoTools project is a step in this direction, and future additional and similar activities could be of use to industry and provide important insights for innovation policy makers in future.