

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

Services and Innovation



In 1999, an OECD Business and Industry Policy Forum concluded that:

“Services are transforming OECD economies on a massive scale, but are still impeded by regulations and policies that stifle innovation and competition. Comprehensive reforms need to be pursued internationally as well as in individual OECD countries. With manufacturing slipping to less than 20% of GDP and the role of services rising to more than 70% in some OECD countries, services are seen as playing a principal role in economies.”²³ And almost 80% of all employed in the Nordic countries in 2009 work within the service sector²⁴.

In 2006–2008, NICE funded the comprehensive project termed ICONs – Innovation and the International Competitiveness Nordic Services. The project’s focus is grounded in the following:

“Most studies in the field of innovation have focused on the relationship between innovation and foreign performance in manufacturing industries, while neglecting the service sector – arguably due to the lack of data availability, and to the difficulty of conceptualising the patterns and performance of service innovation”.²⁵

The aim of the ICONs project was to change that, and in subsequent years several Nordic initiatives linked to services have been launched.

The relationship between services and manufacturing is complex and not always easily understood. Accountancy services provide an example of this. Prior to the Internet age, accountancy was a personal service. Currently, accountancy advice is available on a CD-ROM disk and can be purchased in a standard format off the shelf. In statistical terms, accountance thus becomes a goods product. If the same information is made available for purchase on a website it becomes a service. This example may seem oversimplistic, but it illustrates the complexity involved in considering what constitutes a service as opposed to a goods product in physical terms.

²³ <http://www.oecd.org/dataoecd/10/33/2090561.pdf>

²⁴ www.ixda.org, First Nordic Conference on Service Design and Service innovation, Oslo, 2009

²⁵ http://english.nupi.no/virksomheten/forskningsavdelinger/avdeling_for_internasjonalt_oekonomi/prosjekter/innovation_and_the_international_competitiveness_of_nordic_services_icons

In the 1920's, the Ford Motor Company built the River Rouge assembly plant in Michigan. Coal and iron ore were brought in one end and finished automobiles emerged at the other. Today, this would seem to be an aberrant practice – some sort of bizarre theme park. In fact, the contemporary technology of scale made such work practices entirely rational. There is a great similarity between current state of the banking industry and the automobile manufacturers that built that plant nearly 80 years ago. Today's banks, in much the same way as Henry Ford in the 1920's, are learning the techniques of mass production for the first time.

There was a time when a bank would lend or provide a mortgage to a business. It would take the asset and put it on their books in much the same way as a museum exhibits a piece of art on a wall or under glass – to be admired and valued for its security and constant rate of return. Times have changed. Banks now take those assets, structure them into pools, and sell securities based on those pools to institutional investors and portfolio managers. In effect, they use their balance sheets not as museum exhibits, but as car parks – temporary holding spaces where they can bundle up assets before selling them on to investors who have a far greater interest in holding those assets for the long term. The bank has thus evolved from being a museum which acquired only the finest assets, holding and exhibiting them in perpetuity, into a manufacturing plant, providing a product for the secondary market. Just as Henry Ford did 80 years ago, banks today are focusing on manufacturing standardised products at predictable rates, under standard norms of quality, and are teaching their workforces to produce that product as quickly and as efficiently as possible.

Technology has been key to this process. The reason that we observe a services *economy* today, and why we gather to talk about it and recognise its importance, is because technology has allowed *service* industries to gain the operational leverage that manufacturing achieved 100 years ago. In addition to banks, health service systems, telephone and telecommunications networks, and distribution and retailing firms all provide further examples of sectors that have been able to benefit from economies of scale. As a result, we are now living in a world where global-scale *service* companies exist for the first time, whereas we have seen global manufacturing companies for 50 years or more.²⁶

It is an established fact that most people in the Nordic countries are employed within what is classified as the service economy, where team work, project management, coaching and so forth, are familiar instruments utilised for improving current service economy organisations. However, it is possible that we are still in a situation of trying to understand productivity and performance in terms of the logic of the industrial

²⁶ OECD, STI The Service Economy, Paris 2000, Ehrlich 1999.

age. The management guru W. Edwards Deming taught the Japanese that “people get rewarded for conforming”, and that it was for this reason that US industry was declining. To remedy the situation Deming suggested that organisations should abolish the annual performance appraisal. Deming went on to conclude that without pride in your work your only incentive in having a job is to obtain money. And there is no joy in that. To illustrate his point that it is virtually impossible to measure the performance of an individual in the context of a team he derived the following simple mathematical equation;

$$x + y + xy = 8$$

in which he argued that if x and y represent the respective contributions made by the individual and the system, and xy the contribution made by the interaction between individuals and the system, how can you in all honesty accurately extract the x component, i.e. the individual’s contribution? It is mathematically impossible²⁷.

The reader might ask- what has this to do with the service economy? The answer may be – Quite a lot, and in several ways. The service economy deals essentially with intangibles. Success depends on factors such as the educational levels of the work force, organisation, management and intellectual capital, innovative capacities and skills defined in the broadest sense.

However, most organisations continue by means of various creative devices to try to develop new schemes in which performance and innovation is evaluated based on the appraisal of the x variable, and not on the team. Moreover, people must be prepared if they are to become innovative. Innovation is a discipline which must be managed and measured if it is to be seen to be successful. If we want Nordic companies to become more productive and to enhance their returns on innovation, we cannot ignore services as a process. Every company has to consider how to apply tools and processes, and to adopt disciplined ways of thinking.

In an interview with the New York Times, Irving Wladawsky-Berger, IBM’s vice president for technical strategy and innovation, and a visiting professor at the Massachusetts Institute of Technology noted that:

²⁷ Andrew Razeghi: HOPE how triumphant leaders create the future, pp. 120-121, 2006, Josey-Bass, San Francisco, United States

Corporations need to help prepare university students for the new services-based economy. Information technology is becoming embedded in all aspects of business, society and our personal lives. We see an increasing requirement to apply technology, engineering and disciplined thinking and design to the people aspect of businesses. That's really what we mean by services."

We might also examine Toyota and ask why it took American and European car manufacturers so long to narrow the efficiency gap with the Japanese corporation. The reason is, in large part, that it took Toyota's competitors decades to ferret out the radical management principle at the heart of Toyota's capacity for relentless improvement. Unlike its Western rivals, Toyota has believed for a long time that first-line employees can be more than cogs in a soul-less manufacturing machine; they can be problem-solvers, innovators, and change agents.²⁸

Manufacturing is becoming increasingly services-dependent, and an increasing proportion of service companies are becoming integrated into networks with other economic sectors. Strong links are also developing between goods and services sectors due to complementarities of demand. Such integration implies that separating the two increasingly creates an artificial division that is not reflected in the character of production processes.

Consider the amount of effort invested in attempts to define and characterise services. It seems reasonable to conclude that what we call the service or tertiary sector is so diverse that there can only be a marginal value attached to seeking a coherent and unique (positive) characterisation of this sector. It seems that John Stuart Mill's conclusion still remains valid;






"I have made little use of the popular distinction of industry into [primary, secondary and tertiary³⁵]. For, in truth, this division fulfils very badly the purposes of a classification" (Mill 1869).







Historically, the Nordic countries have invested a comparatively high proportion of their GDP in public sector services. This is due to their belief in, and a consequent focus directed towards, a societal model centred on a comprehensive welfare system and related services. The Nordic countries have recently started to examine innovation among public ser-

²⁸ Gary Hamel: *The What, Why and How of Management Innovation*: Harvard Business Review, February 2006.

vice sector organisations. To date, most focus seems to have been on how to involve the users of the offered services in more systematic ways, supported by innovation programmes promoting user-driven creativity within the public sector.

However, in order to develop adequate organisations it appears that we must also adopt a new focus directed towards disciplines and other factors such as management, public sector organisations and innovation at all levels of society. In particular, focus is required on our business schools and current management teaching methods. We must also focus on how these skills are developed and integrated into existing businesses, organisations and the economy at large. Some of the the innovations which have generated the greatest impact within the last 100 years have occurred within organisations. BusinessWeek provided an illustration of this in March 2009, as is shown in the two tables below.

1910	1920	1931	1943	1950s
				
The ASSEMBLY LINE	MARKET SEGMENTATION	BRAND MANAGEMENT	SKUNK WORKS	LEAN MANUFACTURING
<p>With demand soaring for his model T, Henry Ford took cues from brewer's conveyor systems and slaughterhouses' overhead trolleys to build his assembly line, increasing annual production from 78.000 cars in 1910 to 2 million by the 1920s.</p>	<p>General Motors CEO Alfred P. Sloan managed GM's car models through loosely monitored "divisions", which operated as separate companies with Sloan's oversight, laying the groundwork for today's corporation.</p>	<p>After Procter & Gamble began targeting soap brands to different demographics, it set up brand management, an organisational structure that makes individual managers responsible for each brand's success.</p>	<p>To build a new fighter jet in just 143 days, Lockheed created an organisation called Skunk Works, which used small groups and advance funding to work with little interference from its corporate parent.</p>	<p>After a 1950 strike, Toyota workers were given life time employment. Manager Taiichi Ohno developed ways to up efficiency without cutting jobs, leading to "pull production" in 1954 and "Total Quality Control" in 1961.</p>

1967	1973	1987	1989	1990	2000s
					
SCENARIO PLANNING	360 –DEGREE REVIEWS	SIX SIGMA	OUTSOURCING	RE-ENGINEERING	OPEN INNOVATION
The practice involves envisioning multiple future events and developing plans for responding to them. Shell first experimented with scenario planning in 1967, helping to navigate the oil shock of the 1970s.	Getting feed-back from peers, managers, and underlings may be the scourge of time strapped managers. But when companies first adopted these reviews (DuPont) was first in 1973, they were seen as a leap ahead.	Invented at Motorola , the process, designed to reduce defects and increase efficiency, is most associated with General Electric . Widely used today, the jargon laden tool has been the butt of recent jokes on TV sitcoms.	While the practice of hiring outside tech services dates to the 1960s, outsourcing took root later. In 1989 IBM landed a deal to manage Kodak's data-processing needs. By the 1990s, much of that work stared moving offshore.	Technically defined as a radical rethinking of processes, the fad was often associated with the lay-offs it spurred and with consultant Michael Hammer who cited Ford in his 1990 article "Reengineering Work: Don't automate, Obliterate".	Many companies are ditching fears of "not invented here". Instead, they are buying or <u>licensing</u> inventions and collaborating with companies and customers. Procter & Gamble aims to capture half of its innovations from outsiders.

Source: BusinessWeek, Special Issue: Managing Smarter, Game Changing Ideas for Business, March 23 and 30, 09.

Gary Hammel²⁹ argues that what really fuels long-term success in business is not operational excellence or new business models, but management innovation – new ways of mobilizing talent, allocating resources and building strategies. Peter Drucker, writing in 1993³⁰, states that “there has been a decade of innovations in all areas ... the most innovative area may have been management itself.”

Management innovation not only incorporates new ways of managing innovation, but goes far beyond that in the sense that it also includes the invention of the corporation, mass production, the assembly line, the corporate research laboratory, the living laboratory and the corporate university. It also includes the invention of total quality management, 6 sigma, just-in-time inventory management, benchmarking as a management tool, outsourcing, and a whole range of project management techniques and models applied in areas as diverse as construction and software development. It is clearly of great importance, not only in itself, but also as the enabler of technical innovation. However, management inno-

²⁹ “The Future of Management” by Gary Hammel with Bill Breen, published in 2007 by Harvard Business School Press, ISBN 978-1-4221-0250-3

³⁰ Preface to a new edition of “Innovation and Entrepreneurship” by Peter F. Drucker first published in 1985, available from Elsevier, ISBN 978-0-7506-8508-5.

vation is essentially off-the-radar of those studying innovation systems at national and European level. It is a form of hidden innovation.

Management innovation is not systematically addressed by managers even in major organisations. Most companies lack a formal process for disciplined management innovation. Management innovations can also be traded. Vehicles for the diffusion of management innovation do exist in the form of the business literature, the schools of management, management consulting companies, corporate universities and franchise systems. These arenas are all but ignored in the current debate about how to shape innovation policy for the future. Understanding what it is, where it is, and how it happens is important to both industry and government. It is possible that there is a need to invest in new non-traditional forms of research, together with education and training in recently evolved and related disciplines and new institutions like the Management Innovation Lab³¹ recently set up by Gary Hammel.

The NICE-funded InnoTools project has been examining how innovation develops in companies throughout the Nordic and Baltic region. They have worked with more than 60 managers in 8 companies from 7 countries with employee numbers ranging from 14 to more than 30,000. Thaim of the project has been to determine where innovation is located and how it develops under the following 12 headings³²:

- *Offerings*: Products and services sold.
- *Platforms*: The use of components and technologies that provide the basis for a portfolio of offerings.
- *Solutions*: Customised and integrated combinations of offerings that solve end-to-end customer problems.
- *Customers*: Discovering unmet customer needs
- *Customer Experience*: Everything a customer sees, hears and feels, including customer interactions.
- *Value Capture*: Revenue streams and methods of payment
- *Processes*: How things get done in terms of efficiency, effectiveness and performance.

³¹ <http://www.managementlab.org/>

³² Based on an article of Sawney, Wolcott and Arroniz published in Spring 2006 Vol. 47 No. 3 of the MIT Sloan Management Review entitled "The 12 different ways for companies to innovate".

- *Organisation*: Control, management, and the form, function and scope of activities
- *Supply Chain*: Sourcing of components and human resources etc.
- *Presence*: Where and how you meet customers; sales channels
- *Networking*: Network intelligence; how you utilise the internet to reach new customers.
- *Brand*: Establishing, developing, positioning, leveraging, stretching and extending brands to create new meaning and value

A competition-oriented analysis of a company in terms of how it is positioned in each of these areas, and thus its level of exposure to opportunities for innovation, is referred to as “Innovation Radar”. The method has proved to be very helpful to the companies involved. Note that there is no mention of research or research labs in this list. These represent input variables to any or all of the listed aspects of a business. They are input variables only in the sense that bricks and mortar and planks of wood are components of a building. Architecture, location, design and presentation are all vital elements of a building, but are arguably not sufficient in themselves to ensure a successful outcome.